

UNHCR Nutrition survey
Bhutanese Refugee Camps, Nepal

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Table of Contents

Acronyms:	4
Acknowledgements	5
Executive summary	6
The survey objectives were as follows:	6
Methodology.....	6
Summary of results.....	7
Interpretations	8
Nutrition survey findings 2007-2018	9
Recommendations.....	10
Introduction	11
Background	11
Objectives	12
Methodology.....	12
Sample size.....	12
Data collection and measurements.....	13
Questionnaire.....	13
Haemoglobin measurement	14
Referrals.....	14
Definitions:.....	14
Malnutrition in children 6-59 months:	14
Diarrhoea:	17
Anaemia in children 6-59 months and women of reproductive age:.....	17
Classification of public health problems and targets	17
Survey teams and supervision.....	18
Training of survey members	18
Data management and analysis	19
Results Children 6-59months	19
Response rate.....	19
Description of the survey sample.....	20
Acute malnutrition	20
Acute malnutrition 2007-2014	20
MUAC in children 6-59 months	21
Underweight	21
Stunting in children 6-59 months.....	22
Stunting and underweight 2007-2018.....	23

Overweight.....	23
Comparison nutrition indicators refugees, local population Eastern Terai, national prevalence ...	23
Anaemia	24
Supplementary feeding programmes.....	25
Morbidity and health programme coverage.....	26
Infant and young child feeding practices.....	26
Results Women 15-49 years	27
Response rate.....	27
Description of the survey sample.....	27
ANC programme coverage.....	28
Anaemia non-pregnant women 15-49 years	28
Limitations.....	30
Discussion and Conclusion.....	30
Sample	30
Anaemia	31
Morbidity and health programme coverage.....	31
Infant and young child feeding practices.....	32
ANC programme for pregnant women.....	32
Anaemia in non-pregnant women 15-49 years.....	32
Comparison findings with local population	33
Conclusion.....	33
Recommendations	34
ANNEXES.....	35
Annexe I. 2018 Nutrition Survey team Members	35
Annexe II a. Informed consent form- children.....	36
Annexe II b. Informed consent form- women Consent form Women 15-49 years of age	37
Annexe III a. Questionnaire 6-59 months	38
Annexe III b. Questionnaire 0-23 months.....	40
Annexe III c. Questionnaire women (15-49 years old)	43
Annex IV. Training schedule.....	44
Annexe V. Plausibility check for 2018 Nepal SENS.....	45
Annex VI. Survey area maps (the camps).	46

Acronyms:

AMDA: Association of Medical Doctors of Asia

ANC: Antenatal Care

BR: Bhutanese Refugee

CDC: Centres for Disease Control and Prevention

CI: Confidence Interval

ENA: Emergency Nutrition Assessment

ENA for SMART: name of SMART nutrition survey software

Epi Info: Name of CDC Software for epidemiological investigations including nutrition surveys

EPI: Expanded program on Immunization

GAM: Global Acute Malnutrition

Hb: Haemoglobin

HH: Households

HIS: Health Information System

IYCF: Infant and Young Child Feeding

LSCP: Long Stay Children Programme

MNP: Micronutrients Powder

MAM: Moderate Acute Malnutrition

MUAC: Mid Upper Arm Circumference

OTP: Outpatient Therapeutic Programme

PHC: Primary Health Care

RTH: Road to Health

SENS: Standardised Expanded Nutrition Survey

SMART: Standardised Monitoring and Assessment of Relief and Transitions

SFP: Supplementary Feeding Programme

TFP: Therapeutic Feeding Programme

UNHCR: United Nations High Commissioner for Refugees

WFP: World Food Programme

WHO: World Health Organization

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Executive summary

The nutrition status of Bhutanese refugees in Jhapa and Morang districts of Province 1 of Nepal has been stable for the past 11 years. The prevalence of acute malnutrition remained below the WHO critical threshold of 15% since 2007. Eight nutrition surveys have been carried out by UNHCR in collaboration with AMDA and World Food Programme (WFP) from 2007 to 2014. The Centres for Disease Control and Prevention (CDC) was also involved in five surveys till 2011. In 2018 the situation remains stable with GAM prevalence of 1.6 % among children 6-59 months.

UNHCR and AMDA have been working in consultation with local government to increase refugees' access to nearby government health facilities, while providing support to the government and those facilities in order to achieve sustainable and adequate health services for both refugees and local communities and rationalizing parallel services initially based in camps. The nutrition programme was also discontinued from the camps in 2016 considering the camp stability, population reduction and improved nutrition status.

The survey objectives were as follows:

1. To measure the prevalence of acute malnutrition in children aged 6-59;
2. To measure the prevalence of stunting in children aged 6-59 months;
3. To measure the prevalence of underweight in children aged 6-59 months;
4. To determine deworming coverage among children aged 12-59 months;
5. To determine the coverage of vitamin A supplementation received during the last 6 months among children aged 6-59 months;
6. To assess the two-week period prevalence of diarrhoea among children aged 6- 59 months;
7. To determine the coverage of measles vaccination among children aged 9-59 months;
8. To measure the prevalence of anaemia in children aged 6-59 month;
9. To measure the prevalence of anaemia in non-pregnant women of reproductive age (15-49 years);
10. To investigate IYCF practices among children aged 0-23 months;
11. To determine the coverage of selective feeding programme for children aged 6-59 months;
12. To determine the coverage of measles vaccination among children 6-59 months;
13. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women;
14. To establish recommendations on actions to be taken to address the situation in the Bhutanese Refugee Camps.

Methodology

The survey was designed and conducted using the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology and UNHCR Standardised Expanded Nutrition Survey (SENS) guidelines for refugee populations. Simple random sampling was applied to generate the survey sample of children (0-59 months) (n=177) and women of reproductive age (15-49 years) (n=180) using the list of eligible subjects generated by UNHCR ProGres. Anthropometric measurements, haemoglobin tests and interviews were conducted by trained and experienced survey members. Data were analysed by UNHCR HQ Nutrition team using ENA for SMART software and Epi info 7.2.1.0.

A total of six survey teams composed of four members each were included in each survey. A two days training with one day pre-test were conducted by UNHCR and AMDA medical coordinator to the team members.

Summary of results

Table 1 Primary outcomes of UNHCR nutrition survey, Bhutanese Refugee camps, Nepal 2018

	Number / total	% (95% CI)	Classification of public health significance or target (where applicable)
CHILDREN 6-59 months % [95% CI]			
Acute Malnutrition (WHO 2006 Growth Standards)			
Global Acute Malnutrition (GAM)	2/127	1.6% (0.4 - 5.6)	Critical if ≥ 15% (WHO) UNHCR Target of < 10%
Moderate Acute Malnutrition (MAM)	2/127	1.6% (0.4 - 5.6)	
Severe Acute Malnutrition (SAM)	0/127	0.0% (0.0 - 2.9)	UNHCR Target of < 2%
Oedema	0/127	0.0%	
Mid Upper Arm Circumference (MUAC)			
MUAC <125 mm and/or oedema	0/127	0.0% (0.0 - 2.9)	
MUAC 115-124 mm	0/127	0.0% (0.0 - 2.9)	
MUAC <115 mm and/or oedema	0/127	0.0% (0.0 - 2.9)	
Stunting (WHO 2006 Growth Standards)			
Total Stunting	43/127	33.9% (26.2 - 42.5)	Critical if ≥ 40% (WHO)
Severe Stunting	9/127	7.1% (3.8 - 12.9)	
Programme coverage			
Measles vaccination with card or recall (9-59 months)	118/123	95.9% (90.8-98.7)	Target of ≥ 95%
Vitamin A supplementation within past 6 months with card or recall	92/127	72.4% (63.8-80.1)	Target of ≥ 90%
Diarrhoea			
Diarrhoea in last 2 weeks	9/123	7.3% (3.4-13.4)	
Anaemia			
Total Anaemia (Hb <11 g/dl)	45/126	35.7% (27.4-44.7)	High if ≥ 40% Target of <20%
Mild (Hb 10-10.9)	32/126	25.4% (18.1-33.9)	
Moderate (Hb 7-9.9)	13/126	10.3% (5.5-17.0)	
Severe (Hb <7)	0/126	0.0%	

	Number / total	% (95% CI)	Classification of public health significance or target (where applicable)
Women 15-49 years, non-pregnant		All (95% CI)	
Total Anaemia (<12.0 g/dL)	44/126	(44) 34.9% (26.7-43.9)	
Mild Anaemia (11.0-11.9 g/dL)	26/126	(26) 20.6% (13.9-28.8)	
Moderate Anaemia (8.0-10.9 g/dL)	18/126	(18) 14.3% (8.7-21.6)	
Severe Anaemia (<8.0 g/dL)	0	0.0%	
Mean Hb (g/dL)		12.6 g/dL	
(SD)		(1.52)	
[range]		[8.2-16.8]	

Interpretations

- The survey sample included 177 children of 0-59 months and 180 women aged 15-49. The overall nutrition status remains stable with the improved GAM status, however there is a significant increase of anaemia prevalence in both children 6-59 months and in non-pregnant women 15-49.
- The prevalence of global acute malnutrition among children aged 6-59 months was found to be 1.6 % (CI 0.4-5.6) with no case of severe acute malnutrition observed.
- No case of malnutrition detected when taking measurements using the MUAC.
- The prevalence of anaemia in children aged 6-59 months was 35.7% (CI 27.4-44.7), with mean haemoglobin levels at 11.3 g/dl. Within the survey sample, 25.4% (CI 18.1-33.9) had mild anaemia and 10.3% (CI 5.5-17.0) had moderate anaemia. There was no case of severe anaemia.
The prevalence of anaemia among children of 6-59 months has increased significantly compared to 21% (CI 16.7-26.0) found in 2014. The anaemia was found to be higher among children aged 6-23 months 44.7% (28.6-61.7), which was the same in 2014 (43.2% (CI 33.9-53.0)).
- The prevalence of stunting (chronic malnutrition) has significantly increased in 2018 (33.9%) as compared to 2014 (19.2%). However the prevalence of underweight has decreased in 2018 (8.7%) as compared to 2014 (17.9%).
- The Vitamin A supplementation coverage for the children aged 6-59 months within the past 6 months is 72.4% (63.8-80.1). This is low compared to the UNHCR target of ≥ 90%.
- The coverage of measles vaccination is 95.9%, which is beyond the UNHCR target of >95%.
- The prevalence of anaemia in non-pregnant women aged 15-49 years was found to be 34.9% (26.7-43.9), which is higher compared to 2014 where it was 21.9% (CI 17.5-27.6).
- The prevalence of vitamin A supplementation for women who have given birth in the last six months is 83.3% which is below UNHCR target of > 90%.
- The ante natal care (ANC) enrolment and iron folic acid pills coverage were found to be 83.3% and 90.5% respectively.

- Regarding IYCF we found that the prevalence of exclusive breastfeeding at 6 months was only 29.4% which is low and even lower compared to 2014 where it was 38.5%, although continued breastfeeding at 1 and 2 years were found to be 92.3% and 83.3% respectively.

Nutrition survey findings 2007-2018

Table 2 shows the trend of Bhutanese refugee's nutrition survey's findings from 2007 to 2018 6-59 months (95% CI)

Table 2: Comparison of primary outcomes of nutrition surveys 2007-2018

Indicator	Jan 2007	Oct 2008	May 2009	May 2010	Dec 2011	Nov 2012	Sep 2013	Oct 2014	Oct 2018
	N=497	N=502	N=568	N=569	n=541	n=505	N=448	N=314	N=127
	%	%	%	%	%	%	%	%	%
Anaemia (6-59 months)									
Total (Hb< 11.0)	43.3	43.6	35.9	40.2	26.1	49.9	29.9	21.0	35.7
Mild (Hb 10-11)	24.3	25.1	21.1	25.8	18.5	30.9	17.4	16.6	25.4
Moderate(7-9.9)	18.9	18.1	14.6	14.4	7.6	18.8	12.5	4.5	10.3
Severe(Hb<7)	0	0.4	0.2	0	0	0.2	0	0	0
Mean Hb	11.2	11.1	11.3	11.1	11.5	10.9	11.2	11.8	11.3
Overall anaemia prevalence by age									
6-23 months	71.6	70	59.7	61.5	41	68.3	50.8	43.2	44.7
24-59 months	28.7	31.3	22.4	29.1	17.3	37.9	13.8	8.9	31.8
Nutrition indicators (6-59 months)									
GAM	4	9.2	7.2	8.1	6.8	5	4.7	5.8	1.6
SAM	0.4	1	1.4	0.4	0.4	0.4	0	0.6	0
Stunting	39.2	32.5	28.3	23.2	28.5	19.8	18	19.2	33.9
Underweight	20.9	28.1	22.7	21	20	15.1	15.2	17.9	8.7
Programme indicators									
Vit A coverage	97.6	96.4	98.9	97.7	91.9	90.9	80.6	77.7	72.4
Deworming coverage*	93.9	91.7	97.6	95.1	89.6	88.4	80.3	74.1	77.3
Diarrhoea(2 week incidence)	30	16.9	18	13.2	14.4	7.1	9.2	12.1	7.3

*Includes only children 12-59 months

The results for children 6-59 months of this survey are compared with the findings from previous nutrition surveys and presented in Table 2.

Based on WHO growth standards; the prevalence of global acute malnutrition (GAM) decreased as compared to the previous survey in 2014 (1.6% versus 5.8%). However the prevalence of stunting

(chronic malnutrition) has significantly increased in 2018 (33.9%) as compared to 2014 (19.2%) while the prevalence of underweight has decreased in 2018 (8.7%) as compared to 2014 (17.9%).

The overall anaemia prevalence among children 6-59 months has increased significantly as compared to the prior survey in 2014 (34.9% versus 21%). Children aged 6-23 months are much more affected by anaemia (44.7%) defining a public health problem (level above WHO cut-off of 40 %.)

In regard to programme indicators; the vitamin A coverage in children 6-59 months remains below the UNHCR Target of >90%. In 2018 it has decreased to 72.4% from 77.7% in 2014. Meanwhile the deworming coverage has increased to 77.3% in 2018 from 74.1% in 2014. The diarrhoea incidence in the past 2 weeks has decreased to 7.3% in 2018 from 12.1 % in 2014. The coverage of measles for children aged 9-59 months vaccination was found to be 95.9% (UNHCR target $\geq 95\%$).

Recommendations

- Enhance access to public health services following the rationalization of health services in the camps especially enhancing the access to public/government nutrition programme centres for children aged 6-59 months.
- Enhance the capacity building of CHWs to scale up case finding and timely referral to Nutrition centres.
- Immediate follow up of the children who have not received vitamin A and/or deworming supplementation to increase coverage to optimum levels.
- CHWs to systematically send and follow up children for vitamin A supplementation and deworming to ensure sustainable maintenance of >90% coverage.
- To organize anaemia awareness activities and dietary counselling for young women through existing health education programmes in the camps.
- CHWs to systematically send and follow up pregnant women for ANC and iron folic acid pills supplementation to improve the coverage.
- To use behaviour change communication to stress the nutritional benefits of vegetable gardening, chicken, goat and other small scale animal rearing, and promote consumption of iron rich foods.
- Strengthen the awareness, promotion, and protection of Infant and Young Child Feeding to emphasize more on improving the current IYCF and breastfeeding practices by improving caring behaviour through maternal health education sessions.
- Investigate the factors determining use of breast milk substitutes and bottle feeding and provide appropriate support for safe breast milk substitute utilisation where needed as well as promote breast feeding in the non-breast feeding population.

Introduction

Bhutanese refugees in Nepal are in Province 1, Jhapa and Morang Districts. The camp population has decreased to less than one tenth of its original population of approximately 108,000 due to a large-scale resettlement programme which was launched in 2007. With the conclusion of the large-scale resettlement program at the end of 2016 and the resettlement of over 90% of Bhutanese refugees, UNHCR Sub-Office Damak transitioned from a largely resettlement-driven operation to promoting alternative solutions. There are currently 6656 refugees living in two camps, Beldangi and Sanischare with 5224 and 1432 population respectively.

This report presents the outcomes of the nutrition survey conducted in Beldangi and Sanischare Refugee Camps from 07th to 31st October 2018.

Background

In 2016 the Nutrition programme in Beldangi and Sanischare refugee camps was merged with the health programme considering the camp stability, population reduction and improved nutrition status. As part of local solutions in 2017 and 2018 almost all health services have been transferred to accessible government health hospitals and health posts near by the camps after supporting them to improve the quality of services.

Refugees from Sanischare camp are accessing health and medical services in Pathari Health Post and Mangalbare Hospital while Beldangi refugees have access to Amm Chowk urban community health center and Damak Hospital. The integrated Management of Childhood Illnesses (IMCI) and Maternal and Child Health (MCH) strategies as well as comprehensive Nutrition programmes are available and accessible to refugees in the host community.

Pregnant refugee women are receiving ANC through the safe motherhood programme, which is a National health intervention aiming to reduce maternal and neonatal morbidity and mortality and to improve the maternal and neonatal health through preventive and promotive activities. The package includes incentive of NPR 400 for 4 ANC visits and NPR 500 for delivery in the birthing centre of government recognized health facilities.

In collaboration with AMDA, World Food Programme (WFP) and Centres for Disease Control and Prevention (CDC), UNHCR has carried out five nutrition surveys in the Bhutanese refugee camps from 2007 to 2011. In 2012, the nutrition survey was conducted with onsite technical support from nutrition unit, UNHCR Headquarters, Geneva and in close coordination with WFP and AMDA. In 2013 the survey was carried out by UNHCR Nepal with assistance of a locally hired international consultant with usual collaboration of AMDA and WFP. In 2014, the nutrition survey was conducted in Beldangi and Sanischare camps by UNHCR Nepal with the regular assistance of WFP and AMDA.

Following the rationalization of nutrition and health services in the camps and the changes from food ration support to cash based assistance, UNHCR commissioned to conduct the nutrition survey in Beldangi and Sanischare camps in October 2018 to assess the refugee's nutritional status.

Objectives

The main objective of the nutrition survey was to assess the prevalence of malnutrition and anaemia in children aged 6-59 months and anaemia prevalence in non-pregnant women 15-49 years old and formulate workable recommendations for appropriate nutritional and public health interventions. Additional data was collected on coverage of vitamin A supplementation, deworming, supplementary feeding programme, antenatal care program and Infant and young child feeding (IYCF) practices in the camps.

The specific objectives of this survey are:

1. To measure the prevalence of acute malnutrition in children aged 6-59;
2. To measure the prevalence of stunting in children aged 6-59 months;
3. To measure the prevalence of underweight in children aged 6-59 months;
4. To determine deworming coverage among children aged 12-59 months;
5. To determine the coverage of vitamin A supplementation received during the last 6 months among children aged 6-59 months;
6. To assess the two-week period prevalence of diarrhoea among children aged 6- 59 months;
7. To determine the coverage of measles vaccination among children aged 9-59 months (or context-specific target group e.g. 9-23 months) (see Module 1);
8. To measure the prevalence of anaemia in children aged 5-59 month;
9. To measure the prevalence of anaemia in non-pregnant women of reproductive age (15-49 years);
10. To investigate IYCF practices among children aged 0-23 months; ;
11. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women;
12. To determine the coverage of measles vaccination among children 6-59 months;
13. To determine the coverage of selective feeding programme for children aged 6-59 months;
14. To establish recommendations on actions to be taken to address the situation in the Bhutanese Refugee Camps.

Methodology

The survey was developed using the SMART methodology and UNHCR Standardised Expanded Nutrition Survey (SENS) guidelines for refugee populations. Simple random sampling was applied to generate the survey sample of children (0-59 months) and women of reproductive age (15-49 years) using the list of eligible subjects generated by UNHCR ProGres. Anthropometric measurements, haemoglobin tests and interviews were conducted by trained and experienced survey members. Data were analysed by UNHCR HQ Nutrition unit Geneva using ENA for SMART software and Epi info 7.2.1.0.

Sample size

For this survey, simple random sampling was used to select the subjects. All children aged 0-59 months, women aged 15-49 years registered in UNHCR ProGres and living in the camps are eligible for inclusion in the survey population. UNHCR ProGres provided a list of all eligible women (n=1595) and children (n=498) within the population of 6656 by end of September 2018.

The sample size was calculated using SMART methodology and ENA for SMART software. The sample size was calculated as to estimate the prevalence of GAM with a precision of 5 % and a Confidence Interval (CI) of 95%. Estimated prevalence of GAM of 5.8% was based on the results of the nutrition survey conducted in September 2014.

The sample size was adjusted for a 10% non-response rate and due to the small population size (<10000), a correction factor was applied.

Table 3 sample size justification

Total population (n) 6656							
Group	Indicator	Pop'n (n)	Desired precision (%)	Estimated prevalence of indicator (%)	Expected non response rate (%)	Sample size needed (n)	Correction small size population (<10000) n
Children 0-59 month	GAM	498	3	5.8	10	233	154
Women 15-49 years	Anaemia	1595	5	21.9	10	180	150

Data collection and measurements

All interviews, anthropometric and clinical data collections were performed in the AMDA Primary Health Care Centre (PHCC) of Beldangi and Sanischare camps. Selected children were identified and their primary care givers were requested to come on the day of the survey with Road to Health Cards (RTH) cards. The RTH card includes the child's date of birth, growth progress, immunization status and receipt of vitamin A and deworming tablets. The survey participants, women and children living in camps received instructions and guidance to present at the PHC on different time slots for a smooth progression of the survey and to reduce waiting time. As children and women arrived at the PHCC, their arrival was recorded on the sample list. Women included in the survey were requested to bring their ID card. At the end of each survey day, CHWs visited the households to recruit selected children and women yet unaccounted for by the survey.

The registration list was used to ensure the number of completed questionnaires is equal to the number of registered women and children who participated in the survey.

Questionnaire

The questionnaires were developed following the standard questionnaires used in previous surveys in the Bhutanese refugee camps adapted to the UNHCR SENS standardized questionnaire for Anthropometry and Health, Anaemia, and IYCF. Feedbacks from the interviewers who conducted the interviews previously were incorporated. All questionnaires were reviewed by AMDA and UNHCR.

The questionnaires were developed in English and translated into Nepali and then back translated (English version can be found in Annexe II. a and b). Informed consents were also translated into Nepali. Interviews were conducted in Nepali.

Three questionnaires were used in the survey:

1. A questionnaire to be completed for every child 6-59 months to assess health and nutrition programme coverage. This questionnaire was also used to record data from anthropometry and haemoglobin (Hb) measurements (Annexe III.A).
2. A questionnaire to assess IYCF practices to be completed for every child 0-23 months (Annexe III.B).

3. A questionnaire used for the women of reproductive age (Annexe III.C).

Anthropometric measurements of children included height, weight, Mid-Upper Arm Circumference (MUAC) and presence of bilateral pitting oedema. Children were weighed using a Seca electronic scale (model number 874) and recorded to the nearest 100 grams. The scales were checked for accuracy before each survey day using standardization weights. Caregivers were asked to remove shoes and clothing from the children prior to measuring their weight. Younger children who were not able to stand up straight independently were weighed using the double weighing method.

Height or length was taken to the nearest millimeter using an infant-child United Nations Children's Fund (UNICEF) standard height board. Children less than 24 months of age were measured lying down, while children 24 months and older were measured standing. The length/height measurements were taken by at least two anthropometric measurers following the standard procedure described by the SMART methodology.

MUAC was measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the closest millimeter using a standard MUAC tape.

Bilateral pitting oedema was assessed by applying gentle thumb pressure on to the tops of both feet of the child for a period of three seconds, and thereafter, observing the presence or absence of an indent.

Haemoglobin measurement

Haemoglobin measurements in children aged 6-59 months and non-pregnant women were obtained using Hemocue 301. Blood samples (finger prick) were collected and measurements taken following the SENS guidelines. A quality assurance control of the Hemocue devices was performed each morning prior to data collection using the standard control solutions. Quality control log sheets were kept and Hemocues' were only used when the control solution results fell within assigned ranges.

Referrals

After primary data analysis, children with haemoglobin values less than 11.0 g/dl and women with haemoglobin values less than 12.0 g/dl were advised to visit the health facilities for follow-up evaluation. Among children aged 6-59 months, no case of oedema or MUAC <125 mm was found, however those with either WHZ score <-2 Standard Deviation (SD) or who did not receive the last distribution of vitamin A capsule and the children aged 12-59 months who did not receive the last distribution of deworming were communicated to CHWs and instructed to visit hospital's nutrition centres for follow up.

Definitions:

Malnutrition in children 6-59 months:

Acute malnutrition is defined using weight-for-height index values or the presence of oedema and classified as show in the table below. Main results are reported after analysis using the WHO 2006 Growth Standards.

Table 4 Definitions of acute malnutrition using weight-for-height and/or oedema in children 6–59 months (WHO 2006)

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

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

Table 5 Definitions of stunting using height-for-age in children 6–59 months (WHO 2006)

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

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

Table 6 Definitions of underweight using weight-for-age in children 6–59 months (WHO 2006)

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

Mid Upper Arm Circumference (MUAC) value is used to define malnutrition according to the following cut-offs in children 6-59 months:

Table 7 Classification of acute malnutrition based on MUAC in children 6-59 months (WHO 2006)

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

Child enrolment in selective feeding programme for children 6-59 months: selective feeding programme coverage was assessed using the direct method as follows:

Coverage of SFP programme (%) =

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

Coverage of OTP programme (%) =

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

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

WHO core indicator 1. Early initiation of breastfeeding:

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

Children born in the last 24 months who were put to the breast within one hour of birth

Children born in the last 24 months

WHO core indicator 2. Exclusive breastfeeding under 6 months:

Proportion of infants 0–5 months of age who are fed exclusively with breast milk: including milk expressed or from a wet nurse, ORS, drops or syrups (vitamins, breastfeeding minerals, medicines)

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

Infants 0–5 months of age

WHO core indicator 3. Continued breastfeeding at 1 year:

Proportion of children 12–15 months of age who are fed breast milk.

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

Children 12–15 months of age

WHO core indicator 4. Introduction of solid, semi-solid or soft foods:

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

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

Infants 6–8 months of age

WHO optional indicator 9. Children ever breastfed:

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

Children born in the last 24 months who were ever breastfed

Children born in the last 24 months

WHO optional indicator 10. Continued breastfeeding at 2 years:

Proportion of children 20–23 months of age who are fed breast milk.

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

Children 20–23 months of age

WHO optional indicator 14. Bottle feeding:
 Proportion of children 0-23 months of age who are fed with a bottle
Children 0–23 months of age who were fed with a bottle during the previous day
 Children 0–23 months of age

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

Anaemia in children 6-59 months and women of reproductive age:

Anaemia is classified according to the following cut-offs in children 6-59 months and non-pregnant women of reproductive age. Anaemia cut-offs for pregnant women should be adjusted depending on the stage of pregnancy (gestational age). Pregnant women are not included in routine UNHCR nutrition surveys for the assessment of anaemia due sample size issues (usually a small number of pregnant women is found) as well as the difficulties in assessing gestational age in pregnant women.

Table 8 Definition of anaemia (WHO 2000)

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

Classification of public health problems and targets

Anthropometric data: UNHCR’s target for the prevalence of global acute malnutrition (GAM) for children 6-59 months of age by camp, country and region is < 10% and the target for the prevalence of severe acute malnutrition (SAM) is <2%.

The table 9 below shows the classification of public health significance of the anthropometric results for children under-5 years of age according to WHO.

Table 9 Classification of public health significance for children under 5 years of age

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

Selective feeding programmes: UNHCR Public Health Strategic Plan for Nutrition and Food Security 2014-2018 includes the following indicators. The table below shows the performance indicators for malnutrition treatment programmes according to UNHCR Strategic Plan for Nutrition and Food Security (same as Sphere Standards).

Table 10 Performance indicators for selective feeding programme (UNHCR Strategic Plan for Nutrition and Food Security)

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

* Also meet SPHERE standards for performance

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

Vitamin A supplementation coverage in children: UNHCR Strategic Plan for Nutrition and Food Security states that the target for vitamin A supplementation coverage for children aged 6-59 months by camp, country and region should be >90%.

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

Table 11 Classification of public health significance (WHO 2000)

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

Survey teams and supervision

The survey team was comprised of staff from AMDA and UNHCR most of them had experience in collecting data from previous nutrition surveys. The team consisted of registration, anthropometric measurements, interview team, laboratory technicians, supervisors, data managers and two survey contacts person (survey managers) (see Annexe I for list of name and titles of survey members).

The survey team included 22 refugee incentive workers from the camps. Each survey team member with direct interaction with respondents was fluent in Nepali, the local language. The lab technicians were formally trained in laboratory science. During the survey day, the survey manager supervised the survey members to ensure adherence to measurement protocols and smooth progression of the survey.

Training of survey members

Most of team members had participated in the previous nutrition survey; two-day training was conducted in both English and Nepali (see Annexe IV for the training schedule). The training was prepared and facilitated by UNHCR and AMDA. The training commenced with a plenary session on objectives of the nutrition survey, survey design, codes of conduct and importance of data collection within the overall process of conducting the nutrition survey. Afterwards, the teams were trained individually. The interviewers were trained using training tests especially developed for the questionnaires that were used in the survey. Interviewers conducted a pre-test, including 10 children. The anthropometry team and lab team were sensitized with globally standardized measurement protocols and performed standardization exercises following SMART methodology and SENS guidelines including 10 children.

Training Topics

- Objectives of the nutrition survey
- Anthropometrical measurements: height/length, weight and MUAC measurement techniques and precautions on taking measurements
- Age assessment: preparation of local calendar and how to use local calendar to assist mother to recall the age of their children
- Assessment of health status of the child (illness), immunization data
- Haemoglobin measurement, use of a blood analyzer machine (HemoCue 301)
- Standardization exercise for anthropometric and haemoglobin measurements
- Data collection and interview techniques, procedures
- How to fill the formats properly with practice (data recording procedure and precautions ethical considerations of assessment and sampling procedures).

Data management and analysis

Data was collected by a team of experienced data managers. The head of the team was involved in all previous Bhutanese nutrition surveys. Data was entered on location of the survey and at the office. All questionnaires were manually checked for completeness, consistency and range before data entry by the supervisors and survey managers. This check was also used to provide feedback to the teams to improve data collection as the survey progressed.

Excel templates were used for data entry and creation of data base sheets. Random checks were performed by the survey managers to detect entry errors. The data base sheets were shared with UNHCR HQ Nutrition unit, which performed the data analysis using ENA for SMART and Epi info. The SMART Plausibility Report was generated in order to check the quality of the anthropometric data and a summary of the key quality criteria is shown in Annexe V.

Results Children 6-59months

Response rate

Table 12 shows the samples size estimated using ENA with consideration of 10% of non-response. As the population size was 6656 (below 10000) adjustment with the correction of small size population was applied. The response rate was 100% for children 0-5month, 82.46 % and 88 % for children aged 6-59 months and women respectively.

Table 12 Sample size of the survey population and response rate, Bhutanese refugee camps, 2018

Group	Estimated sample size needed	Number of targeted subjects after adjusting with correction of small population size	Actual surveyed sample	Response rate (%)
0-5 months		23	23	100%
6-59 months Children	223	154	127	82.5%
15-49 Women	180	150	132	88%

Description of the survey sample

Data was collected on a total of 127 children 6-59 months, 63 boys and 64 girls. The sex ratio was 1.7. The Mean age of the children was 28.8 months. Median age was 34.9 months.

Table 13 Distribution of age and sex of sample

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-11	5	62.5	3	37.5	8	6.3	1.7
12-23	12	38.7	19	61.3	31	24.4	0.6
24-35	9	45.0	11	55.0	20	15.7	0.8
36-47	19	50.0	19	50.0	38	29.9	1.0
48-59	18	60.0	12	40.0	30	23.6	1.5
Total	63	49.6	64	50.4	127	100.0	1.0

Acute malnutrition

Prevalence of global acute malnutrition in children 6-59 months was found to be 1.6 %.

Mean of WHZ was -0.17 with a SD of 0.91. No cases of severe acute malnutrition or oedema found in the sample population.

Table 14 presents the prevalence of Global Acute Malnutrition (GAM), MAM and SAM by sex.

Table 14 Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 127	Boys n = 63	Girls n = 64
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(2) 1.6 % (0.4 - 5.6 95% C.I.)	(1) 1.6 % (0.3 - 8.5 95% C.I.)	(1) 1.6 % (0.3 - 8.3 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(2) 1.6 % (0.4 - 5.6 95% C.I.)	(1) 1.6 % (0.3 - 8.5 95% C.I.)	(1) 1.6 % (0.3 - 8.3 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)

The prevalence of oedema is 0.0 %

Acute malnutrition 2007-2014

Table 15 shows the trend of GAM and SAM from 2007 to 2018 as estimated during the annual nutrition surveys. It can be concluded that the prevalence of GAM among children 6-59 months remains low. There is a decrease of prevalence in 2018 (1.6%) as compared to 2014 prevalence (5.8%).

Table 15 trend of GAM and SAM from 2007 to 2018

	Jan 2007 (n=497) % (95% CI)	Oct 2008 (n=502) % (95% CI)	May 2009 (n=568) % (95% CI)	May 2010 (n=569) % (95% CI)	Dec 2011 (n=541) % (95% CI)	Nov 2012 (n=501) % (95% CI)	Sep 2013 (n=444) % (95% CI)	Oct 2014 (n=314) % (95% CI)	Oct 2018 (n=154) % (95% CI)
GAM	4.2% (2.8-6.4)	9.2% (7.0-12.1)	7.2% (5.4-9.6)	8.1% (6.1-10.2)	6.8% (5.0-9.3)	5.0% (3.4-7.3)	4.7% (3.1-7.1)	5.8% (3.7-9.0)	1.6% (0.4-5.6)
SAM	0.6% (0.2-1.8)	1.0% (0.4-2.3)	1.4% (0.7-2.8)	0.4% (0.1-1.3)	0.4% (0.1-1.3)	0.4% (0.1-1.4)	0.0% (0.0-0.9)	0.6% (0.2-2.3)	0.0% (0.0-2.9)

MUAC in children 6-59 months

No case of acute malnutrition was detected by using MUAC measurement.

Bilateral pitting oedema was neither detected in any of the children; therefore, Kwashiorkor prevalence was found to be zero.

Table 16 shows the prevalence of acute malnutrition by sex based on results for MUAC.

Table 16 Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 127	Boys n = 63	Girls n = 64
Prevalence of global malnutrition (< 125 mm and/or oedema)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)

Underweight

The prevalence of total underweight in children 6-59 months was 8.7%, while the prevalence of severe underweight was estimated at 0%. Mean of WAZ was -0.91 with a SD of 0.87.

Table 17 and 18 show the prevalence of underweight by sex and age respectively.

Table 17 Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 127	Boys n = 63	Girls n = 64
Prevalence of underweight (<-2 z-score)	(11) 8.7 % (4.9 - 14.8 95% C.I.)	(6) 9.5 % (4.4 - 19.3 95% C.I.)	(5) 7.8 % (3.4 - 17.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(11) 8.7 % (4.9 - 14.8 95% C.I.)	(6) 9.5 % (4.4 - 19.3 95% C.I.)	(5) 7.8 % (3.4 - 17.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)	(0) 0.0 % (0.0 - 5.7 95% C.I.)

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

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-11	8	0	0.0	0	0.0	8	100.0	0	0.0
12-23	31	0	0.0	3	9.7	28	90.3	0	0.0
24-35	20	0	0.0	2	10.0	18	90.0	0	0.0
36-47	38	0	0.0	3	7.9	35	92.1	0	0.0
48-59	30	0	0.0	3	10.0	27	90.0	0	0.0
Total	127	0	0.0	11	8.7	116	91.3	0	0.0

Stunting in children 6-59 months

The prevalence of stunting (chronic malnutrition) was found to be 33.9% and the prevalence of severe stunting was observed at 7.1%. The mean HAZ score was -1.41 (SD1.16).

Table 20 and 21 show the prevalence of stunting by sex and age respectively.

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

	All n = 127	Boys n = 63	Girls n = 64
Prevalence of stunting (<-2 z-score)	(43) 33.9 % (26.2 - 42.5 95% C.I.)	(21) 33.3 % (22.9 - 45.6 95% C.I.)	(22) 34.4 % (23.9 - 46.6 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(34) 26.8 % (19.8 - 35.1 95% C.I.)	(16) 25.4 % (16.3 - 37.3 95% C.I.)	(18) 28.1 % (18.6 - 40.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(9) 7.1 % (3.8 - 12.9 95% C.I.)	(5) 7.9 % (3.4 - 17.3 95% C.I.)	(4) 6.3 % (2.5 - 15.0 95% C.I.)

Table 21 Prevalence of stunting by age based on height-for-age z-scores

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-11	8	0	0.0	0	0.0	8	100.0
12-23	31	3	9.7	4	12.9	24	77.4
24-35	20	2	10.0	5	25.0	13	65.0
36-47	38	2	5.3	15	39.5	21	55.3
48-59	30	2	6.7	10	33.3	18	60.0
Total	127	9	7.1	34	26.8	84	66.1

Stunting and underweight 2007-2018

Table 22 shows the prevalence of stunting and underweight in children 6-59 months from 2007 to 2018.

The prevalence of stunting has significantly increased in 2018 (33.9%) as compared to 2014 (19.2%). However the prevalence of underweight has decreased in 2018 (8.7%) as compared to 2014 (17.9%)

The general trend was reduction of stunting and underweight over the time since 2007. There was a slight increase of stunting and underweight in 2014 compared to 2013. However the increase was not statistically significant with $p=0.65994$ and $P=0.33706$ for stunting and underweight respectively.

Table 22 Prevalence of stunting and underweight in children 6-59 months from 2007 to 2018

	Jan 2007 (n=497) (95% CI)	Oct 2008 (n=502) (95% CI)	May 2009 (n=568) (95% CI)	May 2010 (n=569) (95% CI)	Dec 2011 (n=541) (95% CI)	Nov 2012 (n=501) (95% CI)	Sep 2013 (n=444) (95% CI)	Oct 2014 (n=314)	Oct 2018 (n=127)
Prevalence (Stunting)	(195) 39.2%	(163) 32.5%	(161) 28.3%	(132) 23.2%	(154) 28.5%	(100) 19.8% *2011 vs. 2012 $p=0.001$	(80) 18.0%	(60) 19.2%	(43) 33.9% *2014 vs. 2018 $p=0.0021$
Mean HAZ	-1.63 ± 1.07	-1.56 ± 0.91	-1.48 ± 1.09	-1.33 ± 0.94	-1.38 ± 1.00	-1.21 ± 0.94	-1.11 ± 1.01	-1.15 ± 1.01	-1.41 ± 1.16
Prevalence (Underwei -ght)	(104) 20.9%	(141) 28.1%	(128) 22.5%	(119) 20.9%	(108) 20.0%	(76) 15.1% *2011 vs. 2012 $p=0.04$	(68) 15.2%	(55) 17.9%	(11) 8.7% *2014 vs. 2018 $p=0.0059$
Mean WAZ	-1.25 ± 1.00	-1.46 ± 0.93	-1.36 ± 0.90	-1.20 ± 0.88	-1.22 ± 0.99	-1.09 ± 0.90	-1.03 ± 0.95	-1.09 ± 0.95	-0.91 ± 0.87

Overweight

Based on weight for height cut offs by sex, one child (0.8%) was found to be overweight.

Mean z-scores and excluded subjects

Table 23 shows that for the calculation of the prevalence of acute malnutrition, underweight and stunting; no subjects were excluded, there is no z score out of range, from the mean observed; z-scores for Weight-for-Height, Weight-for-Age and Height-for-Age.

Table 23 Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	127	-0.17±0.91	1.00	0	0
Weight-for-Age	127	-0.91±0.87	1.00	0	0
Height-for-Age	127	-1.41±1.16	1.00	0	0

* contains for WHZ and WAZ the children with oedema.

Comparison nutrition indicators refugees, local population Eastern Terai, national prevalence

Table 24 Comparison of the prevalence of acute malnutrition, underweight and chronic malnutrition among refugee children, children living in Eastern Terai and children of Nepal as per Nepal's Demographic Health Survey (NDHS) 2011

Group	Acute Malnutrition %	Underweight %	Stunting %
Refugee children 6-59 months in Bhutanese refugee camps (Oct.2018)	1.6	8.7	33.9
Non- Refugee children 6-59 months in Eastern Terai region, Nepal 2011	10.3	24.0	31.4
Children 6-59 months in Nepal (National 2011)	10.9	28.8	40.5

Anaemia

The overall prevalence of anaemia for children aged 6-59 months is 35.7%. The prevalence of mild and moderate anaemia were found to be 25.4% and 10.3% respectively. No cases of severe anaemia were identified. The prevalence of anaemia was found to be much higher among children 6-23 months (44.7%) than among older children 24-59 months (31.8%). The mean haemoglobin level was 11.3 g/dl.

Anaemia among children 6-23 months remains a public health problem (level >40%).

Table 25 shows the mean haemoglobin and the anaemia prevalence by severity disaggregated for age group.

TABLE 25 PREVALENCE OF TOTAL ANAEMIA, ANAEMIA CATEGORIES, AND MEAN HAEMOGLOBIN CONCENTRATION IN CHILDREN 6-59 MONTHS OF AGE AND BY AGE GROUP

	6-59 months (95% CI) N=126	6-23 months (95% CI) N=38	24-59 months (95% CI) N=88
Total Anaemia (Hb<11.0 g/dL)	(45) 35.7% (27.4-44.7)	(17) 44.7% (28.6-61.7)	(28) 31.8% (22.3-42.6)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(32) 25.4% (18.1-33.9)	(11) 29.0% (15.4-45.9)	(21) 23.9% (15.4-34.1)
Moderate Anaemia (7.0-9.9 g/dL)	(13) 10.3% (5.5-17.0)	(6) 15.8% (6.0-31.3)	(7) 8.0% (3.3-15.7)
Severe Anaemia (<7.0 g/dL)	(0) 0.0%	(0) 0.0%	(0) 0.0%
Mean Hb (g/dL) (SD) [range]	11.3 g/dL (1.02) [8.4-13.6]	10.9 g/dL (1.00) [8.4-12.7]	11.4 g/dL (1.00) [8.6-13.6]

Overall anaemia prevalence among children 6-59 months has increased significantly as compared to the prior survey in 2014 (35.7% versus 21.0%). The majority of the cases with anaemia were found to be mild (25.4%) and the survey sample did not find any case of severe anaemia. The mean Hb level has slightly decreased from 11.8 g/dL in 2014 to 11.3g/dl in 2018.

Table 26 gives an overview of the anaemia prevalence estimations by age group and mean Hb levels that were found in the nutrition surveys conducted from 2007-2018.

Table 26 Prevalence of anaemia by age group and mean Hb levels in the nutrition surveys from 2007-2018

Indicator	Jan 2007	Oct 2008	May 2009	May 2010	Dec 2011	Nov 2012	Sep 2013	Oct 2014	Oct 2018
	N=497	N=502	N=568	N=569	n=541	n=505	N=448	N=314	N=126
	%	%	%	%	%	%	%	%	%
Anaemia									
Total (Hb<11.0)	43.3	43.6	35.9	40.2	26.1	49.9	29.9	21.0	35.7 *2014 vs. 2018 p=0.0026
Mild (Hb 10-11)	24.3	25.1	21.1	25.8	18.5	30.9	17.4	16.6	25.4
Moderate(Hb 7-9.9)	18.9	18.1	14.6	14.4	7.6	18.8	12.5	4.5	10.3
Severe(Hb<7)	0	0.4	0.2	0	0	0.2	0	0	0
Mean Haemoglobin levels									
Mean Hb	11.2	11.1	11.3	11.1	11.5	10.9	11.2	11.8	11.3
Anaemia prevalence by age group									
6-23 months	121 71.6%	112 70.0%	123 59.7%	120 61.5%	121 41.0%	139 68.3%	99 50.8%	48 43.2%	38 44.7%
24-59 months	94 28.7%	81 31.3%	31 22.4%	109 29.1%	94 7.3%	116 37.9%	35 13.8%	18 8.9%	88 31.8%

Table 27 compares the observed anaemia prevalence with data from the Nepal's Demographic Health Survey 2011 (NDHS 2011).

Table 27 Comparison of anaemia prevalence by severity in children 6-59 months living in the Bhutanese refugee camps, children living in Eastern Terai and children living in Nepal as per NDHS

	Total Anaemia (Hb<11) %	Mild (Hb 10-10.9) %	Moderate (Hb 7-9.9) %	Severe (Hb<7) %
Refugee children 6-59 months in Bhutanese refugee camps	35.7	25.4	10.3	0
Non-refugee children 6-59 month in Eastern Terai region, Nepal	49.5	30.2	18.6	0.7
Children 6-59 months in Nepal (National)	46.2	27.2	18.5	0.5

Supplementary feeding programmes

Based on the WHZ score, 2 children were identified with acute malnutrition, both with moderate acute malnutrition (MAM) and no child was found with severe acute malnutrition.

As there is no more supplementary Feeding programmes (SFP) in the camps, the 2 children with MAM were found not yet enrolled in the SFP services of government health facilities where refugees have access.

Morbidity and health programme coverage

Table 28 shows the results for the questions on diarrhoea and coverage of the deworming and vitamin A supplementation.

TABLE 28 PERIOD PREVALENCE OF DIARRHOEA

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	9/123	7.3% (3.4-13.4)

TABLE 29 DEWORMING COVERAGE FOR CHILDREN AGED 12-59/24-59 MONTHS WITHIN THE PAST 6 MONTHS

	Number/total	% (95% CI)
Deworming within the past 6 months with card	71/119	59.7% (50.3-68.6)
Deworming within the past 6 months with card or confirmation from mother	92/119	77.3% (68.7-84.5)

TABLE 30 VITAMIN A SUPPLEMENTATION COVERAGE FOR CHILDREN AGED 6-59 MONTHS WITHIN THE PAST 6 MONTHS

	Number/total	% (95% CI)
Vitamin A supplementation in the last 6 months with card	73/127	57.5% (48.4-66.2)
Vitamin A supplementation in the last 6 months with card <u>or</u> confirmation from mother	92/127	72.4% (63.8-80.1)

Infant and young child feeding practices

In total 56 children in the survey sample were aged 0-23 months and their primary caretakers were requested to complete the questionnaire on infant and young child feeding practices.

Table 31 summarizes the findings with regard to IYCF practices.

Only 30.4 % of new-borns had been breastfed within the first hour after birth, and 29.4% of children under 6 months are exclusively breastfed.

Continuation of breastfeeding at 1 and 2 years of age was high (92.3% and 83.3% respectively).

44.4 % of children aged 6-23 months have been introduced to solid, semi solid or soft food while 41.0% consumed iron rich or iron-fortified foods.

Table 31 Prevalence of IYCF

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	17/56	30.4	18.8-44.1
Exclusive breastfeeding under 6 months	0-5 months	5/17	29.4	10.3-56.0
Predominant breastfeeding under 6 months	0-5 months	11/17	64.7	38.3-85.8
Continued breastfeeding at 1 year	12-15 months	12/13	92.3	64.0-99.8
Continued breastfeeding at 2 years	20-23 months	5/6	83.3	35.9-99.6
Introduction of solid, semi-solid or soft foods	6-8 months	4/9	44.4	13.7-78.8
Consumption of iron-rich or iron-fortified foods	6-23 months	16/39	41.0	25.6-57.9
Bottle feeding	0-23 months	25/59	42.4	29.6-55.9
UNHCR INDICATOR				
No breastfeeding under 6 months	0-5 months	1/17	5.9	0.2-28.7
No breastfeeding under 12 months	0-11 months	2/32	6.3	0.8-20.8

Results Women 15-49 years

Response rate

Table 32 shows the response of women and the targeted number of women needed to estimate the prevalence of anaemia with a precision of 5%, a non-response rate of 10% was considered during the planning. The final sample included 150 women aged 15-49 years from whom 132 participated in the survey giving a response rate of 88 %.

Table 32 women response rate

Group	Estimated sample (n)	After adjustment	Actual surveyed sample (n)	Response rate (%)
Women	180	150	132	88

Description of the survey sample

The survey sample only included women aged 15-49 years and the mean age of the women was found to be 30.6 years. Among the 132 surveyed women, 6 women confirmed to be pregnant and 18 women have given birth in the last 6 months.

Table 33 shows the women physiological status and mean age of the women included in the survey sample.

Table 33 Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	126/132	95.5%
Pregnant	6/132	4.6%
Given birth in the last 6 months	18/132	13.6%
Mean age in years [min, max] (all women)	30.6 years [15-49]	

ANC programme coverage

Five out of six pregnant women were enrolled in the ANC programme by the time of the survey. All pregnant women enrolled in to ANC programme have received iron folate pills and deworming.

TABLE 34 ANC ENROLMENTS AND IRON-FOLIC ACID PILLS COVERAGE AMONG PREGNANT WOMEN (15-49 YEARS)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	5/6	83.3% (35.9-99.6)
Currently receiving iron-folic acid pills	38/42	90.5% (77.4-97.3)

Anaemia non-pregnant women 15-49 years

The overall prevalence of anaemia among non-pregnant women aged 15-49 years was found to be 34.9%. The majority of the anaemic women had mild anaemia (20.6%). Moderate anaemia was found to be 14.3%. No case of severe anaemia detected in the survey sample. The mean haemoglobin level of the sample was 12.6 g/dL.

TABLE 35 PREVALENCE OF ANAEMIA AND HAEMOGLOBIN CONCENTRATION IN NON-PREGNANT WOMEN OF REPRODUCTIVE AGE (15-49 YEARS)

Anaemia in non-pregnant women of reproductive age (15-49 years)		All (95% CI) N=126
Total Anaemia (<12.0 g/dL)		(44) 34.9% (26.7-43.9)
Mild Anaemia (11.0-11.9 g/dL)		(26) 20.6% (13.9-28.8)
Moderate Anaemia (8.0-10.9 g/dL)		(18) 14.3% (8.7-21.6)
Severe Anaemia (<8.0 g/dL)		0.0%
Mean Hb (g/dL) (SD) [range]	SRS design	12.6 g/dL (1.52) [8.2-16.8]

Table 36 shows the trend of anaemia prevalence from 2012 to 2018. Compared to the findings of the nutrition survey conducted in 2014, total anaemia prevalence has increased from 14.7% to 20.6%.

Table 36 Anaemia prevalence from 2012 to 2018

	Nov-2012 n=290 (n) % (95% CI)	Sept-2013 n=301 (n) % (95% CI)	Oct-2014 n=278 (n) % (95% CI)	Oct-2018 n=126 (n)%(95%CI)
Mild anaemia (Hb 11.0-11.9 g/dL)	(46)15.9% (11.9-20.6)	(47) 15.6% (11.8-20.3)	(41) 14.7% (10.8-19.4)	(26) 20.6% (13.9-28.8)
Moderate anaemia (Hb 8.0-10.9 g/dL)	(31) 10.7% (7.4-14.8)	(27) 9.0% (6.1-12.9)	(20) 7.5% (4.7-11.3)	(18) 14.3% (8.7-21.6)
Severe anaemia (Hb <8.0 g/dL)	(1) 0.3% (0-1.9)	(0) 0%	(0) 0%	(0)0%
Total anaemia (Hb <12 g/dL)	(78) 26.9% (21.9-32.4)	(74) 24.6% (19.9-29.9)	(61) 21.9% (17.5-27.6)	(44) 34.9% (26.7-43.9) *2014 vs. 2018 <i>p</i> =0.0085
Mean Hb (g/dL)	12.9 (SD 5.8)	12.6 (SD 1.2)	12.8(SD 1.3)	12.6 (SD 1.52)

Table 37 compares the estimated anaemia prevalence of the Bhutanese refugee women of reproductive age with anaemia prevalence of women of the same age in Eastern Terai and Nepal's national prevalence of anaemia among women of reproductive age as per Nepal's demographic and health survey 2011

Table 37 Prevalence of anaemia in Bhutanese refugee women, women in Eastern Terai and women in Nepal

Women 15-49 years	Total anaemia (%)	Mild anaemia (%)	Moderate anaemia (%)	Severe anaemia (%)
Refugee women	34.9	20.6	14.3	0.0
Women Eastern Terai	44.9	37.4	7.6	0.0
Women Nepal	35.0	28.9	5.7	0.3

Limitations

Survey subjects were not much motivated to participate as they used to be in previous surveys. This was due to their feelings with the operation situation in general with the rationalization of health services from camps to host community, the cut of food rations and the nutrition programme already handed over to government health facilities.

In the sample size of children, both genders were equally represented however there was an imbalance in age group towards older children in the sample. This might be attributed to small number of new-borns in 2018 and previous years consecutive to camp refugee population reduction.

Discussion and Conclusion

Sample

Children 0-59 months

The desired sample size for this survey was achieved (>80% of the desired target). The sex ratio of 1.0 indicates that both genders were equally represented in the sample. In regard to age representation, there was a large imbalance in age group towards older children in the sample.

Women 15-49 months

The sample of women comprised women from all age categories. Desired sample size was achieved (>80% of the desired target) to give a precise estimation of anaemia prevalence.

Nutritional status

- Acute malnutrition/Wasting, low weight for height, is caused by a decrease in food consumption and/or illnesses resulting in weight loss which can be sudden or develop over time. Based on WHO classification of public health significance, the critical level is when GAM is $\geq 15\%$. The UNHCR target is $< 10\%$. The GAM has decreased significantly from 5.8% in the previous survey in 2014 to 1.6% in 2018. There were only two cases found during the survey with moderate acute malnutrition. The observed prevalence of acute malnutrition among children 6-59 months in the Bhutanese refugee camps is lower than the local benchmark.
- The prevalence of a low weight for age, referred to as underweight, has increased from 2007 to 2008, and then decreased steadily reaching approximately 2007 levels in 2010. It further decreased to 15.1% in 2012 and remained at 15.2% in 2013. In 2014 the level has raised to

17.9% and in 2018 it has decreased to 8.7% with 11 children out of 127 with moderate underweight. No case of severe underweight found in 2018.

- The prevalence of chronic malnutrition/stunting showed a dramatic decrease from 39.2% in 2007 to 23.2% in 2010, a relative decrease of approximately 40% ($p < 0.001$). After an unexpected increase in 2011, stunting prevalence continued to decrease, reaching 18.0% stunting in 2013. Prevalence of stunting has slightly increased in 2014 to 19.2%. Again this fractional increase is not statistically significant ($p=0.65994$). In 2018 the prevalence of stunting has increased significantly to 33.9% ($p=0.0021$). However the prevalence of stunting remains below the UNHCR critical level (40%), the increase may be in part attributed to discontinuation of nutrition programme in the camp, lack of intake of nutrients essential for linear growth and cut of (fortified) food distribution.

Anaemia

The overall prevalence of anaemia among children aged 6-59 months has increased significantly to 35.7% in 2018 compared to 2014 where it was 21.0% ($p=0.0026$). In 2012, the anaemia prevalence was found to be 49.9% whereas in 2013 the anaemia prevalence came down to 29.9% and 2014 the figure further dropped to 21.0%.

The mean Hb level has decreased from 11.8 g/dL in 2014 to 11.3g/dl in 2018.

With the handover of Nutrition programme to government public health facilities, the MNP programme as well as activities like mother support groups, which were in the camps to provide counselling on prevention and treatment of anaemia, were discontinued in 2016, CHWs are currently responsible to identify suspected cases in the community and refer them to public health facilities.

Comparison with national data shows that the prevalence of anaemia among children of Eastern Terai region is higher than anaemia prevalence found in children 6-59 months living in the Bhutanese refugee camps.

The overall estimated anaemia prevalence for the children in the Bhutanese refugee camps is classified as 'medium' according to WHO criteria for severity of the public health situation. UNHCR Strategic plan for Nutrition and Security states that the target for anaemia prevalence in children 6-59 months of age should be low i.e. $<20\%$, continuation and reinforcement of the anaemia interventions mentioned above will still be essential.

Morbidity and health programme coverage

The prevalence of diarrhoea in the two weeks prior to the survey among children 6-59 months was 7.3%. The diarrhoea prevalence in 2018 has decreased when compared to the prevalence observed in 2014 which was 12.1%.

Vitamin A supplementation programme coverage decreased from 77.7% in 2014 to 72.4% in 2018, which is below the UNCHR standard of $>90\%$.

The coverage of measles for children aged 9-59 months vaccination was found to be 95.9% (Within UNHCR target $\geq 95\%$)

The coverage of deworming in the last 6 months for children 12-59 months increased as compared to 2014 from 74.1% to 77.3%. However the observed deworming coverage is also below the UNHCR standard of $>90\%$.

Infant and young child feeding practices

The 2012 JAM mission highlighted the needs of improved IYCF practices in the camps; hence the nutrition survey has included data on several indicators of IYCF practices among children aged to 0 to 23 months since 2012.

The prevalence of children aged 0-23 months that were breastfed immediately or within the first hour of life is 30.4%. The observed prevalence has decreased compared to 2014 prevalence, which is 55.3%. Due to high number of deliveries by caesarean section (40% of all deliveries), mothers cannot breastfeed immediately within 1 hour after delivery.

The prevalence of exclusive breastfeeding under 6 months is 29.4%, which is lower compared to 2014 survey where it was 38.5%. Exclusive breastfeeding fulfils the food and fluid requirement of the infants during first 6 months of life and provides immunity against common infections.¹

However the prevalence of continued breastfeeding at 1 year and 2 years were found to be 92.3% and 83.3% respectively. There is a slight decrease in these prevalence's compared to 2014 where it was 96.8% and 100% respectively.

Information on bottle feeding was collected because of the association between bottle feeding and increased diarrhoeal disease, morbidity and mortality. 42.4% of the children were bottle fed. The proportion of children that was bottle fed increased quite a lot as compared to 2014 (23.7%).

After six months of exclusive breastfeeding the infant requires complementary food to meet the nutrient requirements needed for a healthy growth. Timely introduction of complementary food is critical for the child's nutritional status. A small proportion of the children aged 6-8 months (44.4%) received solid or semi-solid food the day before the survey. This is a significant decrease compared to 2014 (81.8%). 41.0% of children 6-23 months received iron rich or iron fortified foods which is also low compared to 2014 (48.1%).

The findings show that it is important to strengthen the community based health promotions and education about maternal and child health, importance of best IYCF practices.

ANC programme for pregnant women

Out of 132 surveyed women, six were pregnant (4.6%). Five of them were enrolled in the ANC programme (83.3%). The iron-folic supplementation coverage was 90.5%.

Anaemia in non-pregnant women 15-49 years

Overall prevalence of anaemia among non-pregnant women of reproductive age (15-49 years) was observed at 34.9% and has increased significantly ($p=0.0085$) compared to 2014 (21.9%).

Anaemic women with mild anaemia were 20.6%, moderate anaemia, 14.3% and no cases of severe anaemia were detected.

Generally, Hb levels of the women living in the Bhutanese refugee camps were found to be better than Hb levels of women in reproductive age group living in the Eastern-Terai.

¹ WHO. Indicators for assessing infant and young child feeding practices Part 1 Definitions. 2007. Geneva, Switzerland.

The overall observed anaemia prevalence for non-pregnant women 15-49 years in the Bhutanese refugee camps can be classified as 'medium' according to WHO criteria for severity of the public health situation.

UNHCR Strategic plan for Nutrition and Food Security states that the target for the prevalence of anaemia in women 15-49 years should be low i.e. <20%. Anaemia interventions addressing the multiple causes of anaemia should be continued. Anaemia awareness activities and dietary counselling for young women should be implemented through education programmes in the camps. Vegetable gardening and small scale animal rearing might be reinforced to improve dietary intake of iron.

Comparison findings with local population

The nutritional status and Hb levels, findings of 2018 nutrition survey of Bhutanese refugees in Beldangi and Sanischare camps are still improved as compared to nutrition status findings in the local population and Nepali population.

Conclusion

The prevalence of acute malnutrition and underweight among children 6-59 months in 2018 have decreased significantly compared to 2014. However the prevalence of stunting has increased compared to 2014. The overall prevalence of anaemia among children aged 6-59 months has increased in 2018 compared to 2014. The anaemia prevalence among non-pregnant women of reproductive age (15-49 years) has also increased compared to 2014 findings. The IYCF practices, Vitamin A supplementation, deworming coverage, ANC programme and iron-folic supplementation coverage have deteriorated as compared to 2014. Despite the difference in prevalence compared to 2014, the findings are below the critical levels of UNHCR and remain in acceptable ranges classifying the current nutrition status in Bhutanese refugees as stable situation.

Recommendations

- Enhance access to public health services following the rationalization of health services in the camps especially enhancing the access to public/government nutrition programme centres for children aged 6-59 months.
- Enhance the capacity building of CHWs to scale up case finding and timely referral to Nutrition centres.
- Immediate follow up of the children who have not received vitamin A and/or deworming supplementation to increase coverage to optimum levels.
- CHWs to systematically send and follow up children for vitamin A supplementation and deworming to ensure sustainable maintenance of >90% coverage.
- To organize anaemia awareness activities and dietary counselling for young women through existing health education programmes in the camps.
- CHWs to systematically send and follow up pregnant women for ANC and iron folic acid pills supplementation to improve the coverage.
- To use behaviour change communication to stress the nutritional benefits of vegetable gardening , goat, chicken, pig and other small animal farming, and promote consumption of iron rich foods.
- Strengthen the awareness, promotion, and protection of Infant and Young Child Feeding to emphasize more on improving the current IYCF and breastfeeding practices by improving caring behaviour through maternal health education sessions.
- Investigate the factors determining use of breast milk substitutes and bottle feeding and provide appropriate support for safe breast milk substitute utilisation where needed as well as promote breast feeding in the non-breast feeding population.

ANNEXES

Annexe I. 2018 Nutrition Survey team Members

Consultant/Contact Persons:

Dr. Erick Vladescu Ayirwanda: Associate Public Health Officer -UNHCR

Suman Kumar Nepal: Project Manager AMDA

Supervisors:

Salina Khatoon -Health Associate – UNHCR

Dr. Mira Khadka – Health Coordinator –AMDA

Bahadur Prasad Chaudhary-AMDA

Guru Dhungana - FBM – WFP

Deepika Tamang –Health Program-AMDA

Interviewer:

Nabin Shrestha – Referral Assistant- AMDA

Lekhnath Ghimire-ACHI-AMDA

Sabita Adhikari-Field Associate-WFP

Bhim Kumari Budhathoki-MCHA-AMDA

Anthropometric Measurers:

Dharmendra Rimal- AMDA

Uddhav Khokrel – AMDA

Jagat Mohan Giri-AMDA

Bigyan Thapa-AMDA

Anthropometric Assistant:

Alap Kumar Pradhan

Santa Bahadur Rasaily

Yog Raj Lungeli

Arjun Rai-CHW-Sanischare

Laboratory Assistants:

Birkha Bahadur Gurung- AMDA

Naren Dhungana

Hasta Hang Kerung

Bikram Adhikari

Registration/Control:

Kamal Kumari-CHW-Sanischare

5 CHW/FHP-Beldangi

Laxmi Neopany-Logistic

Data Entry:

Deepak Mahat – AMDA

Dipak Regmi-AMDA

Buddha Hang Rai-AMDA

Sangita Adhikari-AMDA

Data analysis and Report writing:

Caroline Wilkinson –

UNHCR, Nutrition Unit Geneva

Dr Erick Vladescu Ayirwanda

UNHCR, Nepal

Support team:

Vijaya Wasti - UNHCR

Jayendra Raj Koirala – UNHCR

Deep Raj Uprety - UNHCR

Katherine Harris - UNHCR

Annexe II a. Informed consent form- children

Consent form to be signed by caretakers of children 0 to 59 months of age

Nutrition Survey in Bhutanese refugee camps in Nepal 2018.

Hello, we are a group from the Association of Medical Doctors of Asia and United Nations High Commissioner for Refugees (UNHCR). We would like to invite you to participate in a survey that is looking at the nutrition and health status of children and women living in this camp.

- UNHCR is sponsoring this nutrition survey.
- Taking part in this survey is totally your choice. You can stop taking part in this survey at any time and it will not have any negative effects on you or your child.

Your child has been chosen at random from a list of children. I will ask you some questions about your child and I will also measure the weight and height of your child who is older than 6 months and younger than 5 years. We will test a small amount of blood from the finger of your child to see if she/he has anaemia.

- There is no risk to you or your child's health from being in this survey.
- You will not get anything, such as money for being in this survey.
- Before we start, we will ask you to state your consent on this form.
- Any information that you will provide will be kept strictly confidential.
- You can ask me/ members of the survey team any question about this survey.
- If you do not understand the information or if your questions were not answered to your satisfaction, do not declare your consent on this form. Thank you.

Are you willing to be in this survey? Yes___ No___

Name of Caretaker: _____

Signature/Fingerprint of Caretaker:

_____ Date: ___ October, 2018

Annexe II b. Informed consent form- women Consent form Women 15-49 years of age

Nutrition Survey in Bhutanese refugee camps in Nepal 2018.

Hello, we are a group from the Association of Medical Doctors of Asia and United Nations High Commissioner for Refugees (UNHCR). We would like to invite you to participate in a survey that is looking at the nutrition and health status of children and women living in this camp.

UNHCR is sponsoring this nutrition survey.

Taking part in this survey is totally your choice. You can stop taking part in this survey at any time and it will not have any negative effects on you.

You have been chosen at random from a list of women. I will ask you some questions and we will test a small amount of blood from your finger to see if you have anaemia.

- There is no risk to your health from being in this survey.
- You will not get anything, such as money for being in this survey.
- Before we start, we will ask you to state your consent on this form.
- Any information that you will provide will be kept strictly confidential.
- You can ask me/ members of the survey team any question about this survey.
- If you do not understand the information or if your questions were not answered to your satisfaction, do not declare your consent on this form. Thank you.

Are you willing to be in this survey? Yes___ No___

Name of Women:

Signature/ Fingerprint of Women:

_____ Date: ____ October, 2018

Annexe III a. Questionnaire 6-59 months

Data Collection Form, Damak, Nepal, 2018

One questionnaire per child (6 to 59 months)

Date of interview: ____/____/October 2018

Camp: _____ Child ID ____ Interviewer code: ____

(C1) Child ID ____

(C2) HH No ____

(C3) Consent given?..... Yes 1
No 2
Absent 3

(C4) Sex of child Male..... 1
Female..... 2

(C5) Child's date of birth ____ (mm) / ____ (dd) / 2018

(C6) Age in full months ____ full months

(C7) Weight ____ . ____ kg

(C8) Height ____ . ____ cm

(C9) Oedema ? Yes 1
No 2

(C10) MUAC ____ . ____ cm

(C11) Is the child enrolled in any of the nutrition programmes? TFP(SC/OTP 1
TSFP 2
None 3

(C12) Is this child enrolled into BSFP?..... Yes 1
No 2

(C13) Did this child receive Measles Vaccine?..... Yes CARD 1
Yes RECALL 2
No or Don't know 3

(C14) Did this child receive vitamin A past 6 months (show capsule)?..... Yes CARD 1
Yes RECALL 2
No or Don't know 3

(C15) Did this child receive deworming past 6 months (show Tablet)?..... Yes CARD 1
Yes RECALL 2
No or Don't know 3

(C16) During the last 2 weeks, has this child had diarrhoea (Pakhala)? Yes 1
No 2

Don't know 8

(C17) During the last 2 weeks, has this child had other sickness? Yes 1
No 2
Don't know 8

If YES C16 and/or C17:

(C18) did the child visit a health facility?..... Yes 1
No 2
Don't know 8

(C19) Haemoglobin (child) ____ ____ . ____ g/dl

(REFER CHILDREN WITH <7G/DL)

Supervisor's Name:

Annexe III b. Questionnaire 0-23 months

Data Collection Form, Damak, Nepal, 2018

Infant and Young Child Feeding

One questionnaire per child 0–23 months old

Camp: _____ Child ID _____ Interviewer code: _____

Date of interview: ____/____/2018 (MM/DD/YYYY)

SECTION 1:

1) Sex of child..... Male 1
Female 2

2) Child's date of birth from Road to Health Card ____(mm) /dd)/2018

3) Age in full months____ full months

(ESTIMATE USING EVENT CALENDAR AND RECALL IF AGE DOCUMENTATION NOT AVAILABLE)

4) Has this child ever been breastfed? Yes 1
No 2
Don't know 8

If NOT or DON'T KNOW, go to question 7

5) How long after birth did you first put this child to the breast?

- a. Less than one hour 1
- b. Between 1 and 23 hours 2
- c. More than 24 hours 3
- d. Don't know 8

6) Was this child breastfed yesterday during the day or at night? Yes 1
No 2
Don't know8

SECTION 2:

Now I would like to ask you about liquids that this child may have had yesterday during the day and night. I am interested in whether your child had the item even if it was combined with other foods.

7) Yesterday, during the day and night, did this child receive any of the following?

A. Plain water..... Yes 1
No 2
Don't know 8

B. Lactogen, Ceralac, Sarbottompitho, etc (infant formula) Yes 1
No 2
Don't know 8

C. Fresh cow's milk, buffalo milk, adult's milk powder (Everyday, Red Cow, etc)..... Yes 1
No 2
Don't know 8

D. Juice or juice drinks Yes 1
No 2
Don't know 8

- E. Clear broth Yes 1
 No 2
 Don't know 8
- F. Yogurt, curd..... Yes 1
 No 2
 Don't know 8
- G. Maad.....Yes 1
 No 2
 Don't know 8
- H. Milk tea or milk coffee..... Yes 1
 No 2
 Don't know 8
- I. Any other water-based liquids Sodas, other sweet drinks, herbal infusion,
 gripe water, clear tea with no milk, black coffee, ritual fluidsYes 1
 No 2
 Don't know 8
- 8) Yesterday, during the night and day, did this child eat solid or semi-solid food? ..** Yes 1
 No 2
 Don't know 8

SECTION 3:

- 9) Did this child drink anything from a bottle with a nipple yesterday during the day or at night?**
 Yes 1
 No 2
 Don't know..... 8

SECTION 4:

- 10) Is child aged 6-23 months old? ..** Yes..... 1
 No 2

If NO, stop here.

Now I would like to ask you about some particular foods this child may eat. I am interested in whether your child had the item even if it was combined with other foods.

- 11) Yesterday, during the day or at night, did this child consume any of the following?**

- A. Flesh foods like Yes 1
 No 2
 Don't know 8
- B. CSB+..... Yes 1
 No 2
 Don't know 8
- C. CSB++/Super cereal +(SHOW SACHET)..... Yes 1
 No 2

Annexe III c. Questionnaire women (15-49 years old)

Data Collection Form, Damak, Nepal, 2018

Women's Questionnaire

One questionnaire per woman 15 – 49 years old

Date of interview: ____/____/October 2018

Camp: _____ Interviewer code: ____

(W1) Woman ID ____

(W2) HH ____

(W3) Consent given?..... Yes 1
No 2
Absent 3

(W4) Age in years ____

(W5) Did you give birth in the last 6 months?..... Yes 1
No 2
Don't know 8

If NO or DON'T KNOW, go to question W7

(W6) Did you receive a vitamin A capsule after delivery? (*SHOW CAPSULE*)..... Yes card..... 1
Yes recall..... 2
No 3
Don't know 8

(W7) Are you pregnant? Yes 1
No 2
Don't know 8

If NO or DON'T KNOW, go to question W10

(W8) Are you currently enrolled in the ANC programme? Yes 1
No 2

(W9) Are you currently receiving iron-folate pills (show pill)? Yes 1
No 2
Don't know 8

(W10) Haemoglobin ____ . ____ g/dl
(Refer To Clinic For Severe Anaemia IF HB <8.0 G/DL)

(W11) Woman referred for anaemia Yes 1
No 2

Supervisor's Name:

Annex IV. Training schedule

DAY 1				
Time	Activity	Facilitator	Participants	Subjects
08.30-09.00	Breakfast and chia	Dipika	All	
09.15-09.45	Introduction among the team member (game!)	Suman	All	
9.45 - 10.00	High words regarding successful conduction of the Nutrition survey	Dipika	All	
10.00-10.15	Elaboration on Nutrition survey of this year	Salina	All	
10.15 - 10.30	Objectives of the training	Dr Erick	All	
10.30-11.00	Game (catch the ball) and tea	Dr Mira	All	
11.00-12.00	Survey logistics (set up, planning, lunch arrangements, ground rules, clarification of queries, reminder cards, code of conduct for interaction with participants, schedule of the training)		All	
12.00-13.00	LUNCH	Dipika	All	
13.00-14.00	Theory interview - Walk through questionnaire - common errors - quiz terminology and questions - explaining practice round	Dipika	Interviewers	5 children aged 0-23 months and caretakers
14.00-14.45	Practice Round1 (5 participants in each group)	Dipika	Interviewers	5 children aged 0-23 months and caretake
14.45-15.30	Practice Round 2	Mira/Dipika	Interviewers	2women aged 15-49 years old
15.30-16.00	Wrap up and training evaluation		Dr Mira	
DAY 2				
08.30-09.00	Breakfast		All	
09.00-10.15	<ul style="list-style-type: none"> • Theory Anthropometry • Theory Anaemia 	Dr Erick/Dr Mira	All	
10.15 - 12.15	Standardization test Anthropometry	Dr Erick/Dr Mira	Anthropometry team	10 Children
12.15-13.15	LUNCH		All	
13.15 - 14.30	Standardization test Haemoglobin	Dr Erick/Dr Mira	Laboratory team	10 children
14.30-15.30	Discuss standardization test anthropometry/haemoglobin	Dr Erick/Dr Mira	Anthropometry and Laboratory teams	
15.30-16.00	Evaluation Session for the supervisors	Dr Erick	Supervisors	
15.30-16.30	Wrap up/ extra practice/ training evaluation	Dr Erick/Dr Mira/Dipika	All	

Annexe V. Plausibility check for 2018 Nepal SENS

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 (0.0 %)
Overall Sex ratio (Significant chi square) (p=0.929)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0
Age ratio(6-29 vs 30-59) (Significant chi square) (p=0.258)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (10)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (7)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (7)
Standard Dev WHZ .	Excl	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	0 (0.91)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	1 (0.25)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0.09)
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	3 %

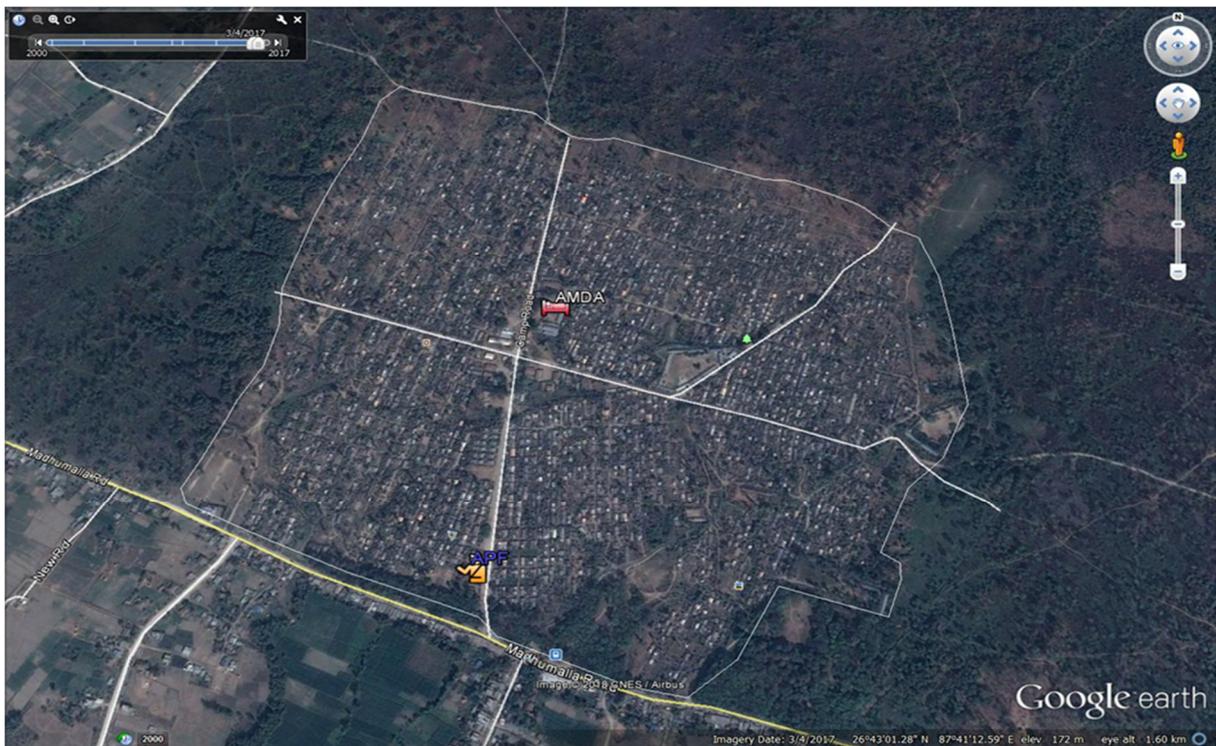
The overall score of this survey is **3 %**, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: **0 %**

Annex VI. Survey area maps (the camps).

1. Beldangi camp located Jhapa District, Damak Municipality



2. Sanischare camp; Morang District, Sanischare Pathari Municipality

