



**Nutritional anthropometric assessment
(Based on SMART methodology)**

**Children aged 6 to 59 months living in IDP camps
Plan intervention area**

**Bhamo, Chipwi, Hpakan, Mansi, Mogaung, Mohnyin, Momaunk, Myitkyina, Swegu, Waimaw
Townships,
Kachin State – Republic of the Union of Myanmar**

January 2014

Data collection period: 14th to 22nd of December 2013

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LIST OF ACRONYM

ANC	Ante-Natal Care
ARI	Acute Respiratory Infection
CHW	Community Health Worker
CI	Confidence Interval
DoH	Department of Health
EBF	Exclusive Breastfeeding
ENA	Emergency Nutrition Assessment (software)
GAM	Global Acute Malnutrition
GCA	Government Controlled Area
GFD	General Food Distribution
H/A	Height-for-Age
HAZ	Height-for Age in Z-score
HH	Household
IDP	Internal Displaced people
IYCF	Infant and Young Child Feeding
KBC	Kachin Baptist Convention
KIA	Kachin Independence Army
KMSS	Karuna Myanmar Social Services
MAM	Moderate Acute Malnutrition
MICS	Multiple Indicator Cluster Survey
MoH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
NCHS	National Centre for Health Statistics
NFI	Non-Food Item
NGCA	Non-Government Controlled Area
NGO	Non-Governmental Organization
NNC	National Nutrition Centre
OPD	Out-Patient Department
OR	Odd Ratio
PLW	Pregnant and Lactating Women
PNC	Post-Natal Care
RSB	Rice Soya Blend
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transitions
TBA	Traditional Birth Attendant
TFP	Therapeutic Feeding Programme
U2	Under two
U5	Under five
UN	United Nations
UNHCR	United Nation High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
W/H	Weight-for-Height
WHZ	Weight-for-Height Z-score
WHO	World Health Organization

EXECUTIVE SUMMARY

Assessment area: Bhamo, Chipwi, Hpakan, Mansi, Mogaung, Mohnyin, Momaunk, Myitkyina, Swegu, Waimaw Townships' IDP camps, Kachin State.

Date of the assessment: 14th to 22nd of December 2013

OBJECTIVES:

- To estimate prevalence of global and severe acute malnutrition among children aged from 6 to 59 months;
- To obtain global and severe chronic malnutrition prevalence among children aged from 6 to 59 months;
- To determine underweight and overweight prevalence among children aged from 6 to 59 months
- To estimate incidence of diarrhoea and acute respiratory infection (ARI) during the preceding two weeks;
- To assess vitamin A supplementation coverage among children aged 6-59 months
- To determine measles vaccination coverage among children aged 9-59 months living in IDP camps
- To define trends for infant and young child feeding (IYCF) core indicators and practices;
- To determine the coverage of food assistance and the duration the food assistance lasts for recipient households.

METHODOLOGY:

- 524 households (HH) selected through simple random sampling within IDP camps' household lists.
- Household data and population figures were provided by camp committees; the number of children below the age of 5 years was estimated to be 13.6% of the total population (around 2632 children)

RESULTS:

Acute Malnutrition rates (in terms of Z-scores and / or prevalence of oedema) with 95 % confidence interval (CI)

Very low rate of acute malnutrition

GAM: 1.9% [95% CI: 0.7 – 4.7%]

SAM: 0.0% [95% CI: 0.0 – 1.7%], no case of kwashiorkor

Chronic Malnutrition rates (in terms of Z-scores) with 95 % CI

Global stunting prevalence above WHO emergency threshold (40%)

Global stunting: 44.5% [95% CI: 38.1 – 51.2%]

Severe stunting: 11.8% [95% CI: 8.2 – 16.8%]

Underweight (in terms of Z-scores) with 95 % CI

Underweight under WHO emergency threshold (30%)

Global underweight: 16.1% [95% CI: 11.8 – 21.5%]

Severe underweight: 0.9% [95% CI: 0.3 – 3.3%]

Overweight (in terms of Z-scores) with 95 % CI

Extremely low overweight rates

Global Overweight: 0.5% [95% CI: 0.1 – 2.6%]

Severe Overweight: 0.0% [95% CI: 0.0 – 4.0%]

Morbidity (2-week cumulated prevalence):

Diarrhoea: 14.2% [95% CI: 10.3 – 19.2%]

ARI: 44.6% [95% CI: 10.3 – 19.2%],

Immunization coverage:

Vitamin A supplementation (6 months recall): 45.3% [95% CI: 38.4 – 51.1%]

Measles vaccination of 9-59 months (with or without card): 86.7% [95% CI: 81.6– 90.5%], 5 children between 6 and 9 months vaccinated (4 with immunization cards)

Coverage of humanitarian food ration

Population benefiting from ration: 99.5%

Gap in food distribution in the past 12 months: 11.5%

Number of gap: 1.35

Average length: 19.5 days

Access to antenatal care (ANC) and postnatal care (PNC)

Attendance to 4 or more ANC visits: 32%

Tetanus immunization: 95%

Deworming: 63%

Supplementation: Iron/folic acid=49%, vitamin A=88%, vitamin B1=47%

Main delivery place: home=42%, hospital=41%;

Main assistance: Doctor=32%, midwife=25%

New-born health check within 48 hours: 17%

Infant and Young Child Feeding – Summary finding:

Timely initiation of breastfeeding (0-23 months): 55.9%

Exclusive breastfeeding under 6 months: 61.9%

Timely complementary feeding: 46.2%

Introduction of solid, semi-solid or soft foods: 62.5%

Continued breastfeeding at 1 year: 69.2%

Minimum dietary diversity: 65.3%

Minimum meal frequency: 47.1%

Minimum acceptable diet: 37.1%

Consumption of iron-rich or iron-fortified foods: 64.8%

Bottle feeding: 4.3%

INTRODUCTION

The conflict in Kachin State broke out again in June 2011 between the Kachin Independence Army (KIA) and the Myanmar Army. In addition to civilian casualties and increased insecurity, major infrastructural damages were caused affecting population access to health, water and sanitation, food and livelihood... and leading to the displacement of many families in various camps spread over a wide area in Kachin State and Northern Shan States^{1 2}. Latest figures from September 2013 estimated the total number of internally displaced people (IDP) to be over 91,000 with 52,000 IDPs (> 55%) in areas beyond the Government's control.

Some families are living in IDP camps since 2 years relying mainly on humanitarian assistance to subsist. Camps are of various sizes and welcome from 20 to 1000 families in wooden/bamboo elevated shelters that required regular maintenance. Recent reports from the humanitarian community stated that authorities, United Nation (UN) agencies as well as local and international Non-Governmental Organizations (NGOs) have quite a good access to camps located in government controlled area (GCA), whereas in some parts of non-government controlled area (NGCA) approximately only 58% of the IDPs are covered by emergency interventions.

Local relief organisations have been the only regular source of assistance in the NGCA since the beginning of the crisis and have been supporting IDP families with the help from international organizations. However, access limitations of international organizations have resulted in a variation in the quality and quantity of assistance provided to those within Government areas, compared to those beyond. As a result and despite the enormous efforts of the local NGOs, not all needs in NGCA have been attended.

Water, sanitation and hygiene (WASH) situation may vary from one camp to another. In term of sanitation most of the camps are equipped with fly-proof latrines, helpful to maintain a relatively good hygiene and prevent water-borne diseases. However, dug well or tube well which quality is not guaranteed seem to be the main water source available, although some camps have also access to water pipelines and tanks. Organizations such as the UN High Commissioner for Refugees (UNHCR), United Nations Children's Fund (UNICEF), the Metta Development Foundation, the Kachin Baptist Convention (KBC), the Karuna Myanmar Social Services (KMSS) and NGOs such as Cesvi, Solidarités International or Oxfam among others are supporting families with Non-Food items (NFI), including hygiene kits. They are also building or renovating WASH facilities.

Camps in GCA get monthly food assistance through the World Food Programme (WFP), each family receiving standard ration complemented with Rice Soy Blend (RSB) for each pregnant and lactating women (PLW) and children aged from 6-23 months³ living in the household. WFP recently reduced its target age group for RSB from 6-59 months to 6-23 months effective this January 2014. In NGCA, no RSB is distributed to PLW and 6-23 months children. The food ration may differ from one month to another and quantity may change according to items availability, security context... Ration mainly comprises 15kg of rice, 1kg of Oil, and 1kg of pulses per person for one month and is distributed every two months. In both GCA and NGCA, families typically supplement this ration with fresh food bought on local markets although quantities remain small and significantly reduce during season (particularly March-August).

With regards to the health situation, most IDPs have access to the hospital in Myitkyina and other main towns or in China. The level of services include usually surgery, radiology, laboratory and general out-patient department (OPD) with in some cases in-patient department, radiology, a maternity ward and a paediatric specialist. Camps are from 5 minutes to 24 hours' drive far from

¹ Myanmar: International Displacement Snapshot – Kachin and northern Shan States, September 2013

² Inter-agency assessment mission to Laiza and Mai Ja Yang areas in Kachin State, UNOCHA, September 2013

³ Standard WFP ration 13.5kg fortified rice, 1.8kg pulse, 0.9Kg fortified cooking palm oil, 0.15Kg salt per person/month and covering 2,100 Kcal/day/person. PLW and 6-23 months children also receive 1.9Kg RSB with sugar and oil /person/month.

hospital. Health centres or local private clinics are an alternative although services are limited, covering antenatal care (ANC), postnatal care (PNC), assistance during delivery and general OPD.

Last Kachin response plan for March to December 2013 raised concern that prolonged displacement may start to impact on the nutritional status of the most vulnerable including children under the age of five years (U5). Strategy was to prioritize nutrition interventions such as Mid-Upper Arm Circumference (MUAC) screening, nutrition assessments, provision of micronutrient supplements and tablets to U5 and PLW as well as nutrition and breastfeeding awareness raising. Taking into account these recommendations, Plan International is starting a nutrition intervention in partnership with KBC in Kachin State IDP camps.

Nutrition assessments in the IDP population in Kachin have been sporadic and limited. There is therefore no extensive data on malnutrition among IDP at State level. However in late 2012, the National Nutrition Centre (NNC) and the Department of Health (DoH) with support from nutrition partners conducted a nutritional assessment among children U5 (0-59 months) in three townships of Kachin State. Findings revealed low level of moderate acute malnutrition (MAM, 1%) and severe acute malnutrition (SAM, 0.7%). Underweight and stunting prevalence were respectively 24% and 39%.

As part of its monitoring programme and in order to clarify the nutrition situation of displaced children aged 6-59 months, Plan International and KBC conducted a nutrition anthropometric SMART survey in IDP camps of Bhamo, Chipwi, Hpakan, Mansi, Mogaung, Mohnyin, Momaunk, Myitkyina, Shwegu, Waimaw Townships (GCA and NGCA). Data were collected from 14th until 22nd of December 2013 corresponding to the cold season where lowest rates of malnutrition can usually be observed among this population.

OBJECTIVES

Main Objective

To determine the nutritional status among children aged 6 to 59 months living in IDP camps within 10 townships of Plan nutrition program's intervention area in Kachin State, Myanmar and collect further information on IYCF and humanitarian food distribution for improved emergency programming.

Specific Objectives

- To estimate prevalence of global and severe acute malnutrition among children aged from 6 to 59 months;
- To obtain global and severe chronic malnutrition prevalence among children aged from 6 to 59 months;
- To determine underweight and overweight prevalence among children aged from 6 to 59 months
- To estimate incidence of diarrhoea and acute respiratory infection (ARI) during the preceding two weeks;
- To assess vitamin A supplementation coverage among children aged 6-59 months
- To determine measles vaccination coverage among children aged 9-59 months living in IDP camps
- To define trends for infant and young child feeding (IYCF) core indicators and practices;
- To determine the coverage of food assistance and the duration the food assistance lasts for recipient households.

METHODOLOGY

Data collection took place from 14th to 22nd of December 2013 in IDP camps in Bhamo, Chipwi, Hpakan, Mansi, Mogaung, Mohnyin, Momaunk, Myitkyina, Swegu, Waimaw Townships, Kachin State. (Household sampling in annexe 1).

Overall work was conducted following SMART⁴ methodology, a fast, standardized and simplified method meant to ensure each household/individual in IDP camps had the same chance to be chosen.

1. Sample size and selection

Target population was children aged from 6 to 59 months and living in above mentioned Townships' IDP camps. Household selection (HH, the basic sampling unit) was performed from an updated list using simple random sampling method under ENA⁵ delta software (September, 1st 2013 version) according to population data per camp/site given shared by camp committees.

As it was not possible to visit the whole population, only a part of it was randomly selected in order to represent the whole population in the target area (10 above mentioned townships). Thus, 493 HH/243 individuals should provide a quite accurate estimation of acute malnutrition prevalence:

Table 1: Summary sample size requirement for nutritional component – Bhamo, Chipwi, Hpakan, Mansi, Mogaung, Mohnyin, Momaunk, Myitkyina, Swegu, Waimaw Townships, Kachin State, Myanmar.

Variable	Data	Comment
Total population	19353	Data from camps committees (October-November 2013 update)
Expected GAM prevalence	8.8	From 2009-2010 MICS survey results
precision	3.4	According to SMART recommendations and context
Design effect	N/A	Value of 1 due to simple random sampling.
HH size	4.62	Extracted from camps committees' data
% children U5	13.6	Data from UNHCR/Kachin state camp profiles, June 2013
% Non-response	10	To compensate for frequent mobility and absence
minimum individuals	243	Correction for small population size
minimum HH	493	Correction for small population size

2. Household and individual selection

2.1. Household selection

In statistical terms, all sampling methods are equivalent, as long as they result in a representative sample. The sampling scheme that should be chosen is determined mainly by the size of the population, the area's topography and households' organization.

In this case and as mentioned above, Household selection was performed from the camp list using simple random sampling method under ENA delta software and were given a unique HH number. A list of selected household (annexe 1) with names was then provided to the team for each day.

That updated list of HH was not based on socio-economic indicator but on the following definition:

"People who slept in the house last night and ate from the same cooking pot".

4 Standardized Monitoring and Assessment of Relief and Transitions

5 Emergency Nutrition Assessment

2.2 Individual selection

All children from 6 to 59 months old in the selected HH were part of the sample for this assessment. Their mother or primary caretaker was also interviewed to collect further data on IYCF for children aged 0-23 months.

Special cases Children

When a child as living in a house but was not present at the time of the visit, he/she was recorded on the data sheet. The team returned at mid-day and end of the day to take the child's measurements. When the child was still absent, he/she was not replaced, an identifying number was given to him/her.

When a child was in a health structure, it was important to measure him. The team then reached the health structure if possible in a reasonable time. When not possible to visit the child in the structure, he/she was not replaced and an ID number was given to him/her. The team recorded that the child was in a health structure.

In case of refusal from the parents to measure their child, he/she was not replaced and an identifying number was given to him/her.

Orphan children taken in by a selected family were considered as part of the HH and therefore included in the sample. It was similar for children who were under care (living permanently) of their grandparents.

Disabled children were eligible and thus included in this assessment. They were given an identifying number and all anthropometric data that were not affected by the disability were measured as well as other additional information. Other data were recorded as missing. In both case a note mentioned the child disability.

Special case household

When a house was empty and neighbours confirmed that the family slept in the house the previous night and would come back (=house not abandoned), the team returned there at the end of the day. When it was not possible to return at the end of the day or when people where still absent at the second visit, it was then recorded as absent. Absent household were never substituted by another one.

In some cases, HH had left the area between the listing/sampling time and the day of the interview. In this case, the HH was considered has abandoned and was not replaced.

When a selected household refused or could not participate because of important reasons, an explanatory note was written on the questionnaire. The HH was not replaced by another one; the team proceeded to the next HH according to the rule.

3. Data collection

SMART questionnaire is provided in annexe 3. For each child eligible and aged 6 to 59 months, following data were collected:

Age: child's age was copied from its birth certificate whenever available. Majority of children had no certificate and birth date was unknown and a local events calendar (annexe 2) was used to approximate the child's age. In any case, birth date was cross checked with event calendar.

Gender: The sex of each child was recorded as "M" for male/boys and "F" for female/girls.

Weight: Children were weighed to the nearest 100 g with a 25kg Hanging Scale similar to Salter scale. All scales were checked daily by using a standard weight of 2 kg and adjusted to "0" with an empty weighing pant, before each measurement. Children were weighed undressed/with a minimum of clothes.

Height/Length: Each child was measured to the nearest 1 mm with a measuring board. Children below 87 cm were measured lying down as those same or above 87 cm were measured in standing position.

Oedema: presence oedema was diagnosed by applying moderate thumb pressure for at least three seconds to both feet (upper side). Oedema grade was not recorded. Only children with bilateral pitting oedema were recorded as having nutritional oedema (kwashiorkor).

Mid-Upper Arm Circumference (MUAC): The MUAC were measured to the nearest 1 mm, at the midpoint of the left upper arm (between the tips of shoulder and elbow) using a coloured MUAC tape.

Vitamin A supplementation: administration of vitamin A caps (sample showed to the family) within the last 6 months was considered. Record was as follow: “0” for No, “1” for Yes, “4” when the respondent did not know.

Diarrhoea: history of disease in the past 15 days was first assessed by the team. When sick, description of the symptoms was cross checked with diarrhoea case definition: *Emission of 3 or more liquid stools over 24 hours*. Coding was as follow: “0” for No, “1” for Yes, “4” when the respondent did not know.

Treatment of diarrhoea: when the child was sick, surveyors also found out about the type of treatment the child may have received using pictures of oral rehydration solution (ORS) and zinc tablets. Following codes were used: “0” for No, “1” when received ORS, “2” when received ORS and Zinc, “4” for Does not know.

Acute respiratory infection (ARI): when enquiring about history of disease in the past 15 days, and when sick, also cross checked symptoms with ARI case definition: *Fever and at least one of the following: rhinitis, cough, redness or soreness of throat OR Fever and fast breath (> 50 breaths/min) and at least one of the following: cough, difficulty in breathing*. Coding was “0” for No, “1” for Yes and “4” when the respondent did not know.

Treatment of ARI: surveyor determined whether the child was brought to an health facility to receive treatment or not (use of picture of amoxicillin). Answer was recorded “0” for No, “1” when brought to a facility and received treatment, “2” when brought to a facility and but did not received treatment, “4” for Does not know.

Measles’ vaccination: immunization against measles was checked and vaccination card requested. Coding was as follow: “0” when child was not vaccinated, “1” when vaccination was confirmed by the card, “2” when only verbally confirmed, “4” when the respondent did not know.

Coverage of general food ration: families were asked if they benefited from the food aid. When they did, enumerator enquired about the occurrence of gap in the past 12 months. For both questions, answer was recorded as follow: “0” for No, “1” for Yes, “4” when the respondent did not know. In case a gap occurred, number of gap and average length of the gaps (in days) was also collected.

For each child aged 0-23 months, IYCF KAP questionnaire was also completed (details in annexe 4).

4. Training and supervision

4.1 Training

A total of 22 people were trained. They attended a total of 6 day theoretical training on assessment methodology, measurement, questionnaires and other assessment tools such as the use of the event calendar. Theory was completed by various practical exercises. In addition, 3 standardization tests took place in order to evaluate and guarantee enumerators’ accuracy and precision in taking measurements (summary results in annex 5). This also allowed supervisor to determine optimal team composition taking also into account post-training test results.

Overall training was completed with a one day field test in non-selected households to recreate real work conditions and enable each team to get familiar with all work aspects (introduction, individual selection, questionnaire filling, measurement, team organization). HH including in field test were not part of the survey sample.

Finally, 17 enumerators and 2 supervisors were identified by the end of the training. At least one woman was part of each of the 6 teams. Six teams were dispatched to complete the sample: 4 teams of three persons in government controlled area along with 2 supervisors and 2 teams (1 team of 3 persons and 1 team with only 2 persons due to limited access) in non-government controlled area with 1 supervisor each. One guideline with main instructions and a materiel kit was provided to each team member and supervisor.

4.2 Supervision

During data collection period teams were supervised by PLAN (one national nutrition programme manager and one nutrition officer) and KBC staff and supported by PLAN nutrition expert. Each team was reviewed at least once every second day. Data collected were entered every evening under ENA delta software, allowing daily quality checking. A meeting was then held the next morning between the team and the supervisor to comment results and make readjustment when necessary.

5. Data analysis (indicators and international/national thresholds used)

Children measurements' check and analysis were done using the latest version of ENA delta software (September, 1st 2013). The results are presented based on WHO standards⁶ and the United States National Centre for Health Statistics (NCHS) references⁷ (in annexe 6).

Analysis was performed using ENA, Excel and EpiInfo 7 for Chi² test in order to explore statistical linkage between parameters (when relevant). Results for this survey are valid for all camps present in the 10 assessed townships and cannot be extrapolated to other townships.

5.1 Acute malnutrition rate

In this report, acute malnutrition (wasting) is estimated according to the weight for height (W/H) of each child and/or the presence of oedema. Weight for height (expressed in z-score) are calculated by comparing the measurements of the sample with 2006 WHO standard population.

Results are presented in annex according to NCHS reference in z-score and in percentage of the median for comparative value with previous assessments. Acute malnutrition is defined as follow⁸:

Table 2: Acute malnutrition classification according to W/H index and/or presence of bilateral pitting oedema

Classification	Criteria
Global acute malnutrition	W/H below -2 z-score (80% of the median) and/or Oedema
Severe acute malnutrition	W/H below -3 z-score (70% of the median) and/or Oedema

The weight for height index is used to quantify and qualify the prevalence of wasting in a population in emergency situations, where acute forms of malnutrition are the predominant pattern. However, the mid-upper arm circumference (MUAC) is a useful tool for rapid screening of children and detection of those who are at high risk of death. Though MUAC was measured in all children, analysis was only performed on those with a height same or above 67 cm.

Table 3: Acute malnutrition classification according to MUAC cut off in children under 5 years old population and height ≥ 67cm

MUAC in mm	Classification
115 – 124 mm	moderate acute malnutrition
< 115 mm	severe acute malnutrition

5.2 Chronic malnutrition - Stunting

The height-for-age (H/A) index provides indication on the nutritional history of a child rather than his/her current nutritional status. This indicator is used to identify chronic malnutrition or stunting.

The same principle is used as for weight-for-height, except that a child's chronic nutritional status is estimated by comparing its H/A with WHO standards height-for-age curves, as opposed to weight-for-height curves. As for the weight-for-height index, the height-for-age index as a Z-score was calculated according to WHO standard data and the following H/A cut-off points were applied:

6 World Health Organization, 2006

7 NCHS: National Centre for Health Statistics (1977) NCHS growth curves for children birth-18 years. United States. Vital Health Statistics. 165, 11-74.

8 WHO, use and interpretation of anthropometric indicators of nutritional status, Bulletin of the WHO, 64 (6) : 929-941 (1995)
WHO: World Health Organization, WHO growth curves for children, 2005

Table 4: Chronic malnutrition classification among under five years old children

Classification	Criteria
Not stunted:	≥ -2 z-score
Moderate stunting:	$-3 \text{ z-score} \leq \text{H/A} < -2 \text{ z-score}$
Severe stunting:	$< -3 \text{ z-score}$

5.3 Underweight

Underweight is often used in growth monitoring to monitor general nutrition status without differentiating acute malnutrition and chronic malnutrition.

Prevalence are determined using the weight-for- age (W/A) in z-score and compared to WHO reference following below cut-off points:

Table 5 : Underweight classification among under five years old children

Classification	Criteria
Underweight	<i>W/A below -2 z-score</i>
Severe underweight	<i>W/A below -3 z-score</i>

5.4 Overweight

As obesity become an increasing public health issue in developing countries, prevalence of overweight using the W/H in z-score was also calculated using WHO reference and followed below cut-off points:

Table 6 : Overweight classification among under five years old children

Classification	Criteria
Overweight	<i>W/H above 2 z-score</i>
Severe overweight	<i>W/H above 3 z-score</i>

5.5 Immunization prevalence

WHO recommends that 90% of children aged from 9 to 59 months are being vaccinated against measles for an efficient protection against the disease.

Last mass measles campaign in Kachin State conducted by the Ministry of Health (MoH) occurred in March 2012 (22nd-30th) and Vitamin A supplementation campaign in August 2013.

5.6 Infant and Young Child feeding data – KAP questionnaire

IYCF practices were evaluated for children aged 0-23 months that were part of selected HH household. Due to the limited number of children, results presented will not be representative but will show trends in feeding practices.

Following the CARE Guide, document which provides guidance and tools for the implementation of IYCF Knowledge Attitude and Practice (KAP) surveys, compliance rates for below core indicators were determined:

Timely initiation of breastfeeding (children 0-23 months): Proportion of children 0-23 months who were put to the breast within one hour.

Children 0-23 months who were put to the breast within the first hour of birth

Total number of children 0-23 months

Exclusive breastfeeding under 6 months: Proportion of infant 0-5 months of age who were fed exclusively with breastmilk in the past 24 hours (no other liquids not even water with the exception of drops or syrup consisting of vitamins, mineral supplements or medicines)

This definition follows WHO 2001 recommendation⁹.

Children 0-5 months who received breast milk in the past 24 hours
and did not receive any other foods or liquids in the past 24 hours

Total number of infant 0-5 months old

Timely complementary feeding: Percent of infant 6-9 months of age who receive breastmilk and a solid or semi-solid food in the previous 24 hours. Solid, Semi-solid and soft foods are defined as mushy or solid foods, not fluids. They should be included after 6 completed months (180 days).

Number of infant 6-9 months who were breastfed in the past 24 hours
and who also received at least one food in the past 24 hours

Total number of breastfed infant 6-9 months

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

Number of infant 6-8 months who received at least one food in the past 24 hours

Total number of infant 6-8 months

Continued breastfeeding at 1 year: Proportion of children 12-15 months old who are fed breastmilk.

Number of children 12-15 months who received breastmilk in the past 24 hours

Total number of children 12-15 months

In this report we'll also look at an alternative indicator suggested by WHO: continued breastfeeding at 2 years of age (when children are 20-23 months)

Minimum dietary diversity: Proportion of children 6-23 months who received food from 4 or more food groups in the past 24 hours. The 7 food groups used to calculate this indicator are:

- 1) Grain, roots tubers;
- 2) Legumes and nuts;
- 3) Dairy product like milk, yoghurt or cheese;
- 4) Flesh food;
- 5) Eggs;
- 6) Vitamin A rich fruits and vegetable;
- 7) Other fruits and vegetables.

Number of children 6-23 months who received food from 4 or more
of the 7 food groups in the past 24 hours

Total number of children 6-23 months

Minimum meal frequency: Proportion of breastfed and non-breastfed children 6-23 months of age who receive solid, semi-solid or soft foods the minimum number of times or more.

Expected number of meal depend of whether or not children are breastfed leading to two calculations and are as follow:

If children are breastfed: 2 times meal/snacks for 6-8 months, 3 times for 9-23 months.

If they are not breastfed: 4 times for 6-23 months.

⁹ WHO (2001): The optimal duration of exclusive breastfeeding. Report of an Expert Consultation.

Number of children 6-23 months who received solid, semi-solid or soft foods
the minimum number of times or more during the previous day

Total number of children 6-23 months old

Minimum acceptable diet: Proportion of children 6-23 months of age who receive a minimum acceptable diet (apart from breastmilk). Calculation performed in two times: for breastfed and non-breastfed children.

Number of children 6-23 months who had at least the minimum dietary diversity
and minimum meal frequency in the past 24 hours

Total number of children 6-23 months

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

Number of children 6-23 months who received at least one iron-rich or iron-fortified food

Total number of children 6-23 months

Bottle feeding: Proportion of children 6-23 months who were fed with a bottle during the previous day.

Number of children 6-23 months who were fed with a bottle during the previous 24 hours

Total number of children 6-23 months

DATA QUALITY CHECK

1. Anthropometry

After correction, overall survey can be considered of good quality with an overall score of 10% (plausibility check report in annexe 7¹⁰). The quality of the anthropometric data is good with standard deviations within acceptable range for all indicators¹¹ and the percentage of SMART flags for each index are very low. In addition, digit preference scores for weight, height and MUAC are either good or excellent. A summary is provided in table below.

Table 7: Mean Z-scores, Design effect and excluded subject for Weight-for-Height, Height-for-Age and Weight-for-Age index per strata.

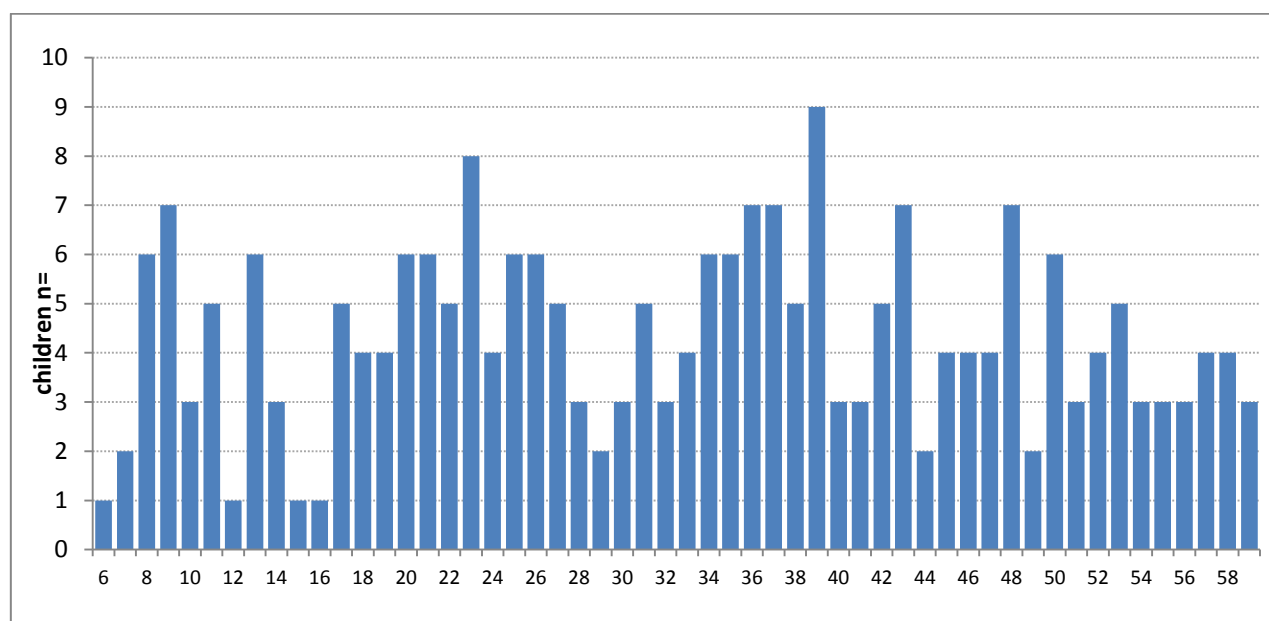
Indicator	N	Mean z-score $\pm$ SD	Design effect (Z-score < -2)	z-score not available	Out of range z-score	% SMART Flags
Weight-for-Height	216	-0,17 $\pm$ 0,83	1,00	17	1	0.5
Weight-for-Age	218	-1,11 $\pm$ 0,87	1,00	16	0	0.0
Height-for-Age	220	-1,77 $\pm$ 1,06	1,00	14	0	0.0

Shapiro-Wilk test indicates the data are normally distributed (Gaussian curves normal, $p > 0.05$). Skewness and Kurtosis values for WHZ and WHA are normal¹². However, HAZ Kurtosis absolute value is borderline which translates into a relative flatness of the HAZ curve (cf. results section) and indicates that data may be affected with a problem. Yet, all other test on height, age and HAZ indicator points to a good quality of data. Therefore with regards to the Skewness and Kurtosis values, distribution of the population regarding WHZ, HAZ and WAZ can be considered as symmetrical and quite normal.

2. Age distribution

Analysis of the sample age distribution was performed on all children with age data available (N=234) and is presented in the figure below. Age distribution is considered excellent and as expected with a 6-29 /30-59 months ratio of 0.75¹³. Slight pic observed in this figure are therefore not considered significant.

Figure 1 : Distribution of sample according to the age (in month)



¹⁰ The Poisson distribution score (=5) does not apply since there was no cluster sampling. Therefore, overall survey score is 10% instead of the 15% mentioned in the plausibility check.

¹¹ Normal range [0.8-1.2]

¹² Skewness normal range [-0.2-0.2], Kurtosis normal range $< |0.2|$

¹³ The value should be around 0.85

RESULTS

1. Sample characteristics

1.1 Non-response rate and proportion of under 5 children in population

Although accurate data is not available, reports from field teams mention only a limited number of selected households not found during data collection period. Non-response rates is therefore not expected to be more than 10%.

Survey showed that 4.1% of the children mentioned in camp list were not found which, in addition to the absent rate and refusal rate, results in a sample completion of 89.3% and less precise results (3.6% precision instead of the 3.4% initially planned). Taking this into account, average number of U5 per household instead of the 0.61 according to camp's data is rather expected to be around 0.5 child/HH.

Table 8: Sample non response rate

	Plan N	Covered n	% Non- Response	Not found		Absent		Refusal	
				n	%	n	%	n	%
Household	493	N/A	N/A						
Children 6-59 m	243	217	10.7%	10	4.1%	11	4.5%	5	2.1%

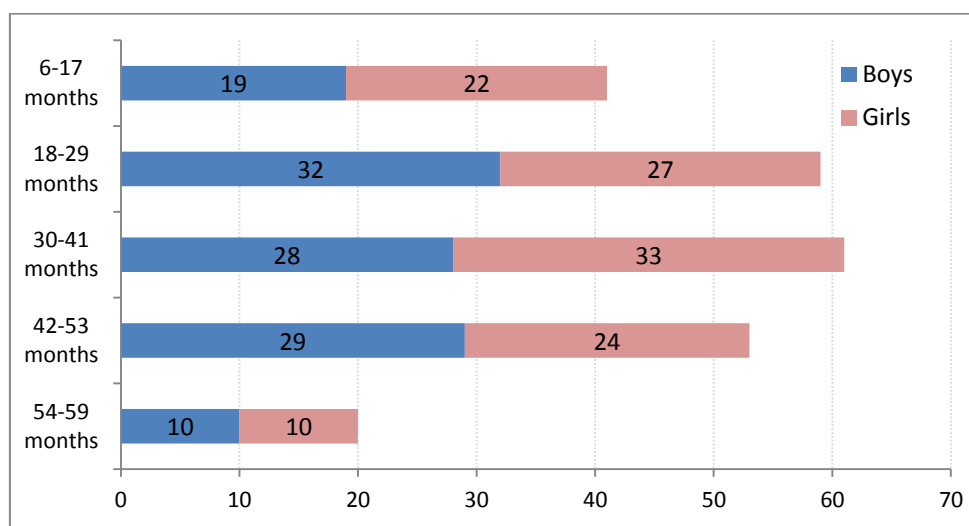
1.2 Gender distribution per age group

Overall sex ratio of 1.0 is within normal range¹⁴ with no significant imbalances within each age categories suggesting an equal representation of boy and girls in the sample and a standard gender/age distribution¹⁵.

Table 9 : Sample age and gender distribution (N=234)

Age	Boys		Girls		Total		Ratio Boys/Girls
	n	%	n	%	n	%	
6-17 months	19	46.3	22	53.7	41	17.5	0.9
18-29 months	32	54.2	27	45.8	59	25.2	1.2
30-41 months	28	45.9	33	54.1	61	26.1	0.8
42-53 months	29	54.7	24	45.3	53	22.6	1.2
54-59 months	10	50	10	50	20	8.5	1.0
Total	118	50.4	116	49.6	234	100	1.0

Figure 2: Age distribution (in months) among sampled children in IDP camps (N=234)



¹⁴ Normal range for the sex ratio: [0.8-1.2]

¹⁵ Ratio 6-29/30-59 months = 0.75, normal value around 0.85

2. Nutritional status of children aged 6-59 months in the area

2.1 Acute malnutrition prevalence

Weight-for-height analysis (W/H) has been performed under 2006 WHO standards. After exclusion of SMART flags (1 child, 0.5% flag WHZ), 216 children aged 6 to 59 months were part of this analysis. Results showed an average W/H index of -0.17 with a standard deviation (SD) of 0.83 within normal range¹⁶.

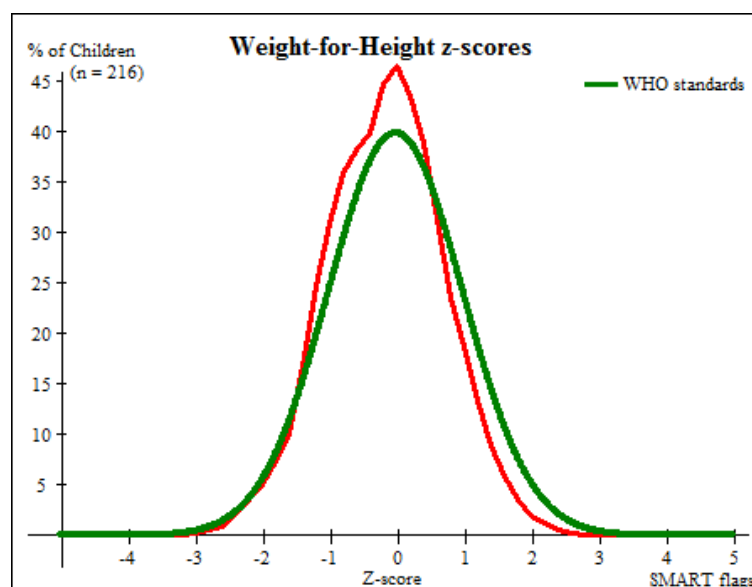
Prevalence of GAM in IDP camps is only 1.9% (n=4) with all affected children being MAM cases. This result is far under the 15% emergency threshold defined by WHO. Considering the possibility some of the non-response children may have been malnourished, it is likely that GAM rate would still be very low. No link was established between age or gender and malnutrition ($p>0.05$).

Table 10 : Acute malnutrition prevalence in children aged 6-59 (N=216) and 6-29 months (N=93), per strata and expressed as weight for height in z-score and/or presence of oedema, WHO standards

	Global acute malnutrition	Moderate acute malnutrition	Severe acute malnutrition
6-59 months	1.9% [95% CI:0.7 – 4.7]	1.9% [95% CI:0.7 – 4.7]	0.0% [95% CI:0.0 – 1.7]
6-29 months	0.0% [95% CI:0.0 – 4.0]	0.0% [95% CI:0.0 – 4.0]	0.0% [95% CI:0.0 – 4.0]

Figures below illustrate samples weight for height distribution curve in z-scores compared to the WHO standards. Sample curve is almost not shifted to the left, which indicated that the assessed populations has a quite good nutritional status, similar to the WHO reference curve.

Figure 3: Weight-for-height distribution: sample versus 2006 WHO reference population, with SMART flags' exclusion (N=216)



2.2 MUAC analysis

MUAC was taken for all surveyed children but only those with a height ≥ 67 cm were part of the analysis. Therefore, 2 children were excluded from this analysis both their MUAC being above 125cm. Considering MUAC criteria and independently from their WHZ, results seem to indicate that no children suffer from acute malnutrition.

¹⁶ Normal range for SD [0.8-1.2]

Table 11 : Nutritional status based on MUAC measurement (height≤67cm) and presence of oedema for children aged 6-59 months (n=218) and 6-29 months (n=94)

	MUAC<115mm and/or oedema	115mm≤MUAC<125mm no oedema	MUAC≥125mm no oedema
6-59 months	0.0% [95% CI:0.0– 1.7]	0.0% [95% CI:0.0 – 1.7]	100.0% [95% CI:98.3 – 100.0]
6-29 months	0.0% [95% CI:0.0 – 3.8]	0.0% [95% CI:0.0 – 3.8]	100.0% [95% CI:96.2 – 100.0]

2.3 Chronic malnutrition prevalence

Chronic malnutrition or stunting prevalence estimations were done through Height-for-Age (H/A) analysis under 2006 WHO standards. No SMART flag was detected and 220 children aged 6 to 59 months living in the camps were part of this analysis.

Average H/A index for the sample is -1.59 ± 1.04 , SD in the normal range¹⁷. Prevalence of stunting in the area is above the 40% WHO emergency threshold with 44.5% (n=98) of the children affected by the disease, indication of a long term nutrient deprivation and micronutrients deficiencies. Among them, 32.7% (n=72) are moderate cases and 11.8% (n=26) suffer from severe forms of stunting.

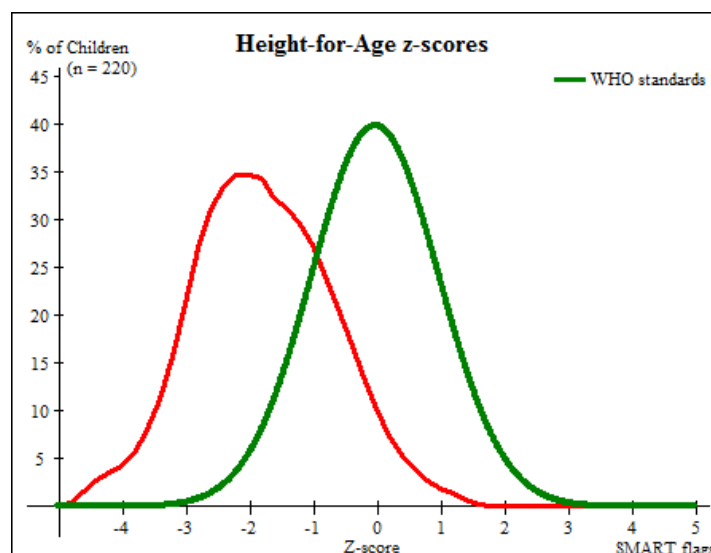
In addition, children aged 6-29 months seem to be slightly more vulnerable to stunting compared to children aged 30-59 months ($p<0.001^{18}$), mainly due to the impact of the displacement on HH living conditions and feeding practices. This, since younger children are likely to be born after the family had moved to the IDP camps. No statistical link was observed between gender and stunting ($p>0.05$).

Table 12 : Chronic malnutrition prevalence in children aged 6-59 (n=220) and 6-29 months (n=96), expressed as height-for-age in z-score, WHO standards

	Global chronic malnutrition	Moderate chronic malnutrition	Severe chronic malnutrition
6-59 months	44.5% [95% CI:38.1 – 51.2]	32.7% [95% CI: 26.9 – 39.2]	11.8% [95% CI:8.2– 16.8]
6-29 months	31.3% [95% CI:22.9 – 41.1]	22,9 % [95% CI:15.6 – 32.3]	8.3% [95% CI:4.3 – 15.6]

Figure next page illustrates the sample H/A distribution curve in z-score compared to the WHO standards. Sample curve is shifted to the left, which indicated that the assessed populations has a poorer nutritional status compared to the reference.

Figure 4: Height-for-age distribution: sample versus 2006 WHO reference population, with SMART flags' exclusion (N=220)



¹⁷ Normal range for SD [0.8-1.2]

¹⁸ OR=0.37 [0.21-0.65], $\chi^2=12.1882$, $p=0.0004821073$

2.4 Underweight prevalence

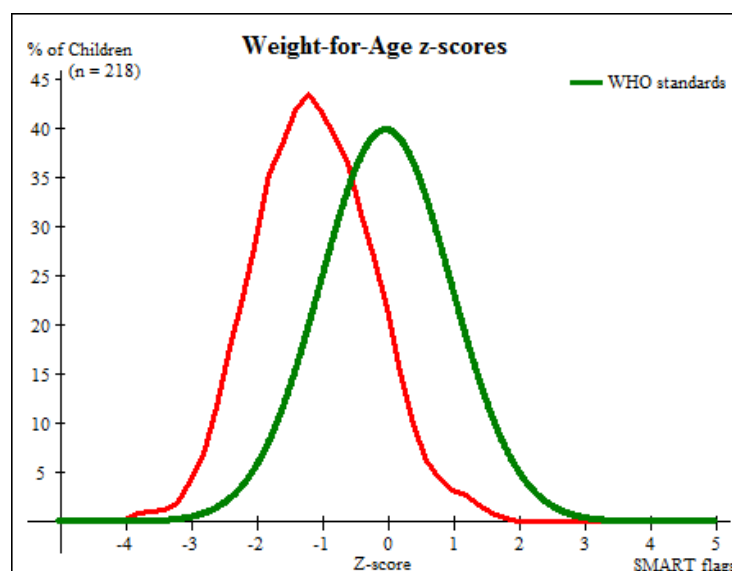
Weight-for-age analysis has been done under 2006 WHO standards. No SMART flags were noticed for this index and 218 children aged 6 to 59 months for whom data was available were part of this analysis. Average W/A index in the population equals -1.11 with a SD of 0.87, in the normal range¹⁹. Prevalence of underweight among children was 16.1% (n=35) with 15.1% (n=33) moderate and 0.9% (n=2) severe forms. This results is far under the 30% WHO emergency threshold and expected considering the low GAM rate. Children aged 6-29 months were found to be slightly more at risk to be affected by underweight than older children ($p < 0.05$ ²⁰). No correlation between gender and underweight was found ($p > 0.05$).

Table 13 : Underweight prevalence in children aged 6-59 (n=218) and 6-29 months (n=94), expressed as weight-for-age in z-score, WHO standards²¹

	Global underweight	Moderate underweight	Severe underweight
6-59 months	16.1%	15.1%	0.9%
	[95% CI:11.8 – 21.5]	[95% CI:11.0 – 20.5]	[95% CI:0.3 – 3.3]
6-29 months	9.6%	9.6%	0.0%
	[95% CI:5.1 – 17.2]	[95% CI: 5.1 – 17.2]	[95% CI:0.0 – 3.9]

As for W/H and H/A curves, figure illustrates the sample W/A distribution curve in z-score compared to the WHO standards. Sample curve is also shifted to the left, indicating that the assessed population has a poorer nutritional status than the WHO reference population.

Figure 5: Weight-for-Age distribution: sample versus 2006 WHO reference population, with SMART flags' exclusion (N=218)



2.5 Overweight

Overweight analysis was also performed under 2006 WHO standards using W/H index. Assessed population does not seem to be affected by overweight as only one cases of moderate overweight was detected during field work. This leads to a prevalence of global overweight of 0.5%.

Table 14 : Overweight prevalence in children aged 6-59 (n=216) and 6-29 months (n=93), expressed as weight-for-age in z-score, WHO standards

	Global overweight	Moderate overweight	Severe overweight
6-59 months	0.5%	0.5%	0.0%
	[95% CI:0.1 – 2.6]	[95% CI:0.1 – 2.6]	[95% CI:0.0 – 1.7]
6-29 months	0.0%	0.0%	0.0%
	[95% CI:0.0 – 4.0]	[95% CI:0.0 – 4.0]	[95% CI:0.0 – 4.0]

¹⁹ Normal range for SD [0.8-1.2]

²⁰ OR=0.40 [0.18-0.90], $\chi^2=5.1497$, $p=0.0232512077$

²¹ Results presented according to ena calculation and rounding explaining discrepancies between global and moderate + severe

2.6 Malnutrition caseload estimation

Figure 6 below summarize main findings and clearly show that the 6 to 59 months children population is mostly struggling with chronic malnutrition. They were indeed 44.5% to suffer from stunting when only 1.9% of them are affected by acute malnutrition and 15.1% by underweight. Therefore, acute malnutrition, underweight but also overweight cannot be considered critical problems in these camps whereas chronic malnutrition is.

Cases present in intervention area at the time of the assessment were estimated in table 15 given population data (cf. methodology) and W/H, H/A, W/A based findings.

Figure 6 : Summary of malnutrition prevalence among children 6 to 59 months old living in Kachin IDP camps

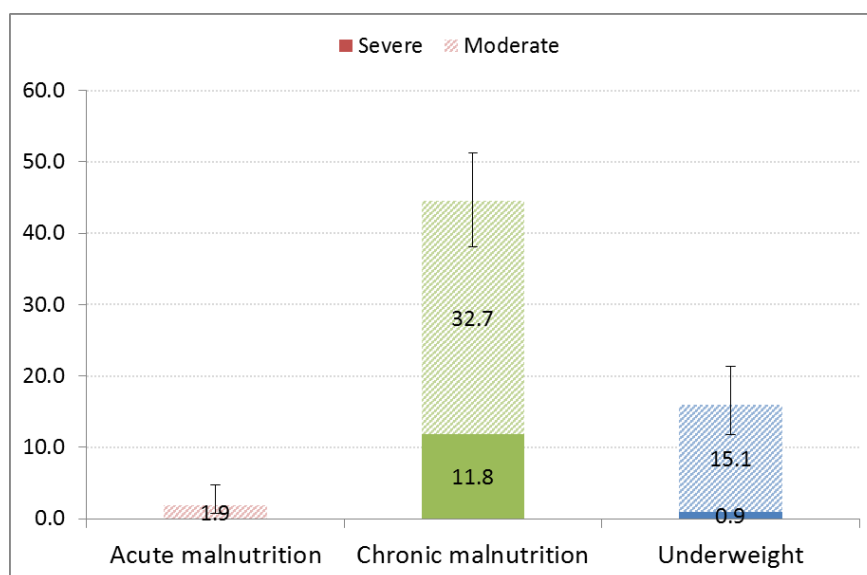


Table 15 : Estimated cases of acute malnutrition, chronic malnutrition and underweight in Kachin IDP camps

	Acute malnutrition	Chronic Malnutrition	Underweight
<i>Population 6-59 months*</i>		2369	
Total cases	45	1054	381
Moderate form	45	775	358
Severe form	0	280	21

* Estimation with 6-59 months=90% of U5 population

3. Morbidity and immunization

3.1 Diarrhoea and acute respiratory infection (ARI) incidence and treatment

Table 16 present findings related to morbidity among surveyed children in the past 2 weeks. Despite the possibility of misdiagnosis, overall ARI incidence is alarming with 44.7% of children affected by the disease in the last 15 days. Overall diarrhoea incidence of 14.2% was concerning but not yet critical. Also, 8.2% of the children were reported to have suffered from both infections in the past 2 weeks.

Table 16 : Incidence of diarrhoea and ARI among children living in IDP camps (15 days recall)

N	Diarrhoea only		ARI only		Diarrhoea +ARI		Not sick/ Do not know	
	n	%	n	%	n	%	n	%
233	14	6.0%	85	36.5%	19	8.2%	115	49.4%

Lack of treatment may impact on length and virulence of the infection thus the nutritional status although no statistical link could be established between diarrhoea or ARI and acute malnutrition. When looking further into access to treatment, results indicated that 42.7% of children affected by diarrhoea received ORS and 18.2% ORS and Zinc which is a positive sign but can be improved. With regards to ARI treatment, among the 80.7% children brought to a health facility 69.2% received an antibiotic treatment (amoxicillin).

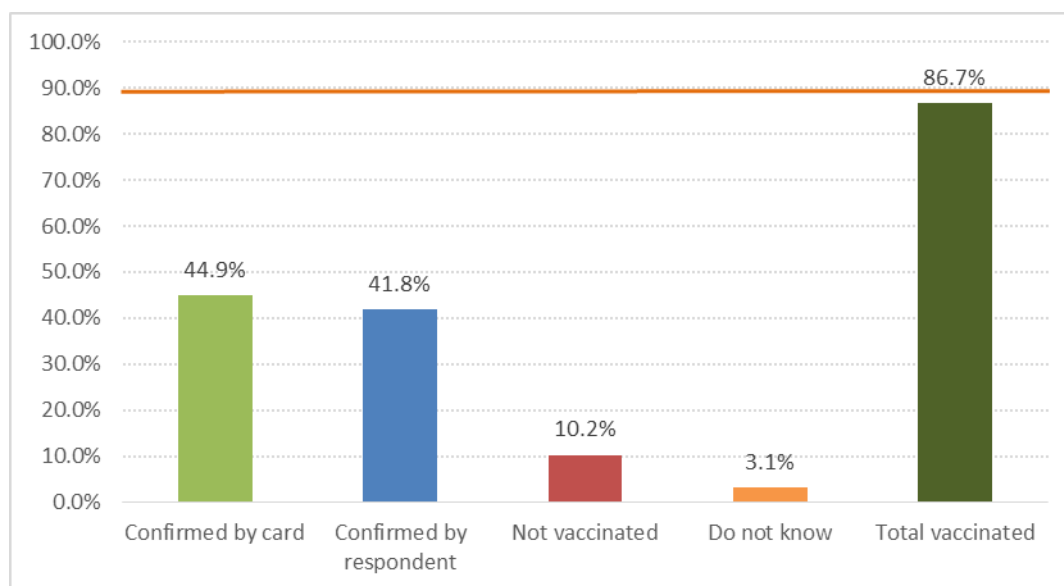
3.2 Vitamin A supplementation and measles coverage

Last mass measles campaign in Kachin State conducted by the Ministry of Health (MoH) occurred in March 2012 (22nd-30th) and Vitamin A supplementation in August 2013.

Coverage of target population for vitamin A treatment is low among children aged 6-59 months. Indeed, only 45.3% of them had been supplemented in vitamin A in the last 6 months (52.1% not covered and 2.6% did not know). This low coverage is surprising considering the dates of the last supplementation campaign.

Regarding measles immunization, findings revealed good coverage for children aged 9-59 months. They were indeed, 86.7% to be immunized in camps with also 5 children vaccinated against measles though less than 9 months. This result is above the 80% minimum coverage recommended by WHO to prevent epidemics yet under the 90% coverage required for an efficient protection against measles. A significant number of children did not have cards which indicates that they may have been reached through massive campaigns rather than routine immunization, where cards are usually provided.

Figure 7: Measles vaccination status among children aged 9 to 59 months and living in Kachin State IDP camps (N=225)



4. General food ration coverage

A total of 183 household with children aged 6-59 months were included in this survey and almost all of them were benefitting from the humanitarian food assistance (99.5%) which is as expected. However, 11.5% of the families mentioned some interruption in the distribution (4.9% form GCA and 6.6% form NGCA) with an average of 1.35 gap in the past 12 months lasting around 19.5 days.

Table 17 : General food distribution coverage for families with children aged 6-59 months living in Kachin IDP camps.

	N	Do not know		No		Yes	
		n	%	n	%	n	%
Receveid the food ration?	183	1	0.5%	0	0.0%	182	99.5%
Gap in the past 12 months?	182	0	0.0%	161	88.5%	21	11.5%
Number of gap	21					1.35	
Average lenght (days)	21					19.5	

5. Access to maternal and child health care

Although families surveyed are living in camps, pregnant women have access to town services in addition to camp health facilities, making a follow up of pregnancy, safe delivery condition and post-natal care possible. Antenatal care (ANC) and post-natal care (PNC) visits are also the opportunity to sensitize the mother on positive IYCF practices.

Interviews of mother of children U2 revealed that 86% had at least 1 ANC visit during their pregnancy which show a good access to such service yet only 32% made four or more visits as recommended by national guideline.

Table below summarizes findings related to ANC visits and pregnant women immunization and supplementation, very good for tetanus and vitamin A but moderate for other components.

Table 18 : Coverage of ANC services and attendance during U2 mothers' pregnancy

N	93		78	78	78	76	79
Number of visit	n	%	Tetanus	iron/ folic acid	vitamin A	vitamin B1	Deworming
Don't know	1	1%					
No visit	12	13%					
1 visit	10	11%	95%	49%	88%	47%	63%
2 visits	13	14%					
3 visits	27	29%					
4 or more	30	32%					

Delivery mainly takes place at home (42%) or at the hospital (41%) and less so in other health facilities (9%), camp clinic (7%) or other places.

Pregnant women always had assistance for their delivery, main one coming from doctors (32%), closely followed by midwives (25%) and nurses(22%), then by family members (13%), traditional birth attendant (TBA, 6%) or other persons like their husband (2%).

After delivery, only 10% of the mother reported no check on the new-born's or did not know, 17% confirmed that someone had checked the child's health within 48 hours although 73% of the baby's health check was performed after 48 hours.

6. Infant and young child feeding (IYCF)

6.1 Summary findings on IYCF principles awareness and feeding practices

Questions on IYCF practices were asked for each child included in this assessment and less than 2 years old. Due to the limited number of children covered, these results cannot be considered as representative for the whole area but are rather trends in feeding practices and believes.

Figure 8 and 9 summarize sampled population meeting international recommendations on IYCF according to each core indicator and knowledge on the 4 IYCF principles.

When comparing practices to knowledge of the population on the 4 main IYCF principles, results seem to indicate that half of the population have a quite good knowledge of them (52.7%). However, when comparing knowledge to practices, some discrepancies can be noticed.

Figure 8 : Summary findings on IYCF practices among children aged 0-23 months old living in Kachin IDP camps

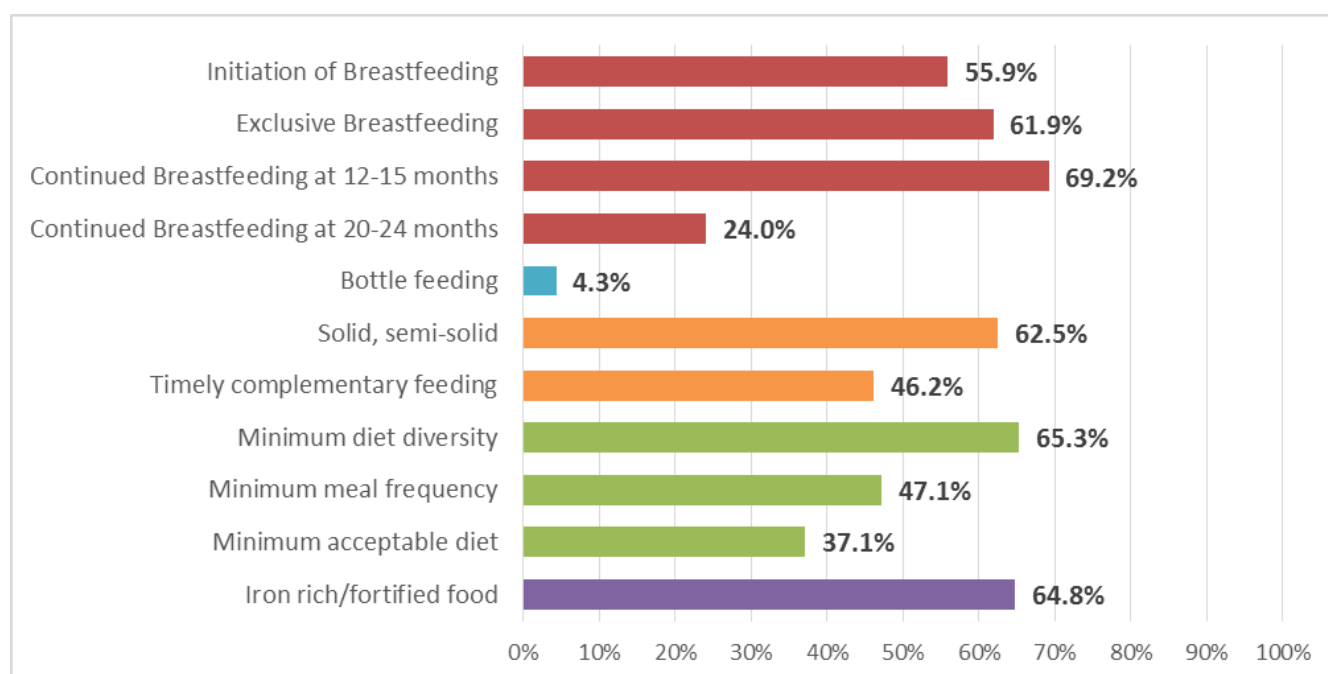
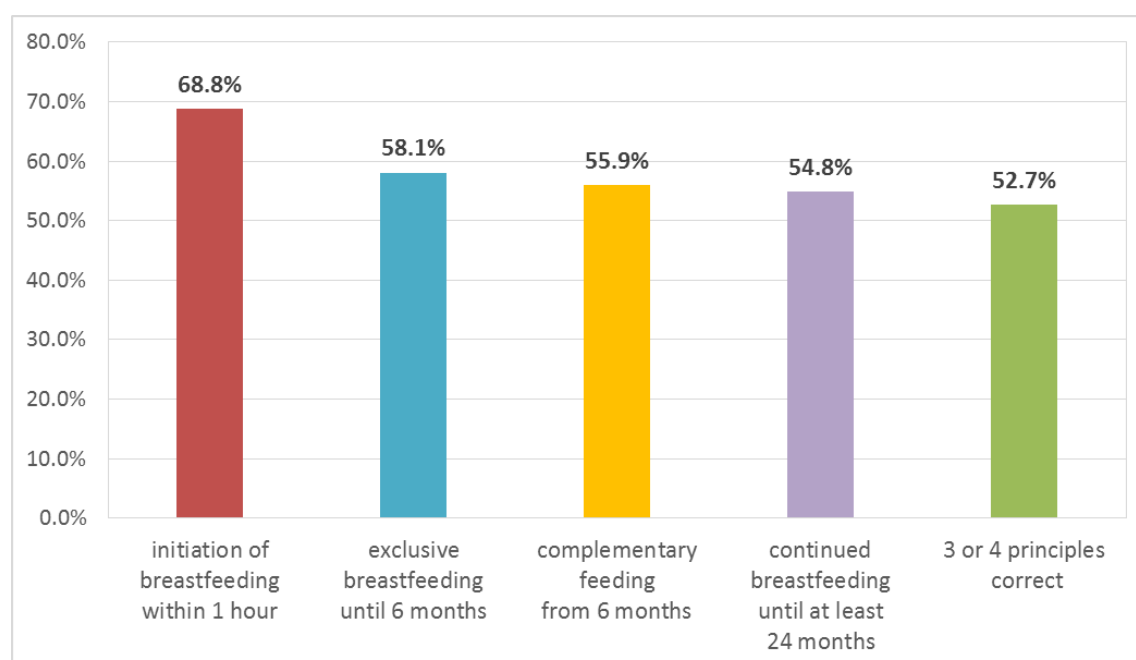


Figure 9 : Caretaker's knowledge on IYCF principles



6.2 Initiation of breastfeeding

International community recommends to initiate breastfeeding within the first hour after child's birth to contribute to infant optimal nutrition and decrease by up to 22% neo-natal mortality²². In this area, although 68.8% of the respondent were aware of the importance of initiating breastfeeding within an hour only 55.9% actually did it. This result is still quite low considering impact on child's health and survival and highlight the need for more sensitization in the community on that topic.

For 69.9% of the mothers, it was perceived as beneficial for the child even when initiation did not take place within an hour (14%). Reason not to initiate breastfeeding as per international recommendations were diverse, some linked to sickness or caesarean (11.8%), misconception around the colostrum (6.5%) or perception the colostrum was not enough (6.4%).

²² Edmond, K et Al. Delayed breastfeeding initiation increases risk of neonatal mortality. *Pediatrics* 2006;117(3):e380-6

Main decision maker on that matter were the mothers (75%) followed by medical staff or nurses (16%) which show the importance of more awareness raising among that community. Grandmother/in-law family or husbands were not major decision maker (respectively 6% and 2%).

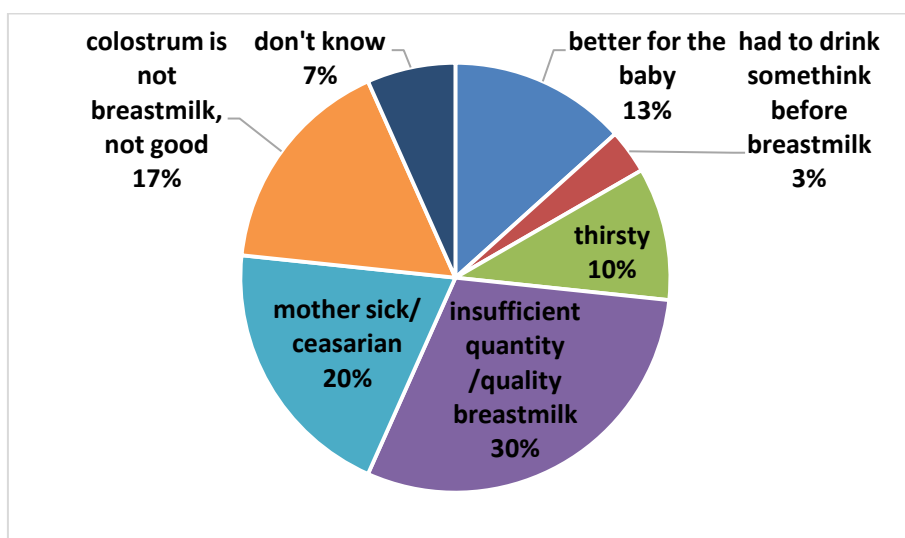
6.3 Exclusive breastfeeding

Relation between knowledge around exclusive breastfeeding (58.1%) and practice seem consistent. Overall area shows indeed an exclusive breastfeeding rate of 61.9%, which indicate already good practices in the community.

However, this results could be improved considering misconception and believes present in some areas. The majority of U2 children were not given any liquid in the following 3 day of birth (68%). When caretaker introduced a liquid, this was mainly infant formula (19%) and linked to caesarean. In a lesser extend water (5%) sugary water (4%), animal milk (2%) or plant mixture (1%) were also provided. Availability of infant formula, animal milk and bottle and teats was reported to be limited.

This may impact on the bottle feeding rate found to be relatively low among surveyed community (4.3%) and indicates that liquids are likely given using a cup or a spoon. Orphans were reported to be fed with infant formula or by wet-nursing although no orphan was still breastfed at the time of the survey. Reason to introduce liquid within 3 days after birth are described in figure below.

Figure 10 : Reason for introducing liquids within 3 days after the child's birth



Surprisingly, medical staff and nurses are the main decision maker for introducing liquids into the new-born's diet (63.3%) with the mother being far behind (20%). Other persons such as elders (10%), grandmother and in-law (3.3%) or the husband (3.3%) also play a role. This reinforces the need for sensitization among the medical sector as such practice may be harmful for the child.

6.4 Complementary feeding

International recommendations are to maintain exclusive breastfeeding until the age of 6 months to then introduce complementary food while continuing breastfeeding until 24 months and onwards.

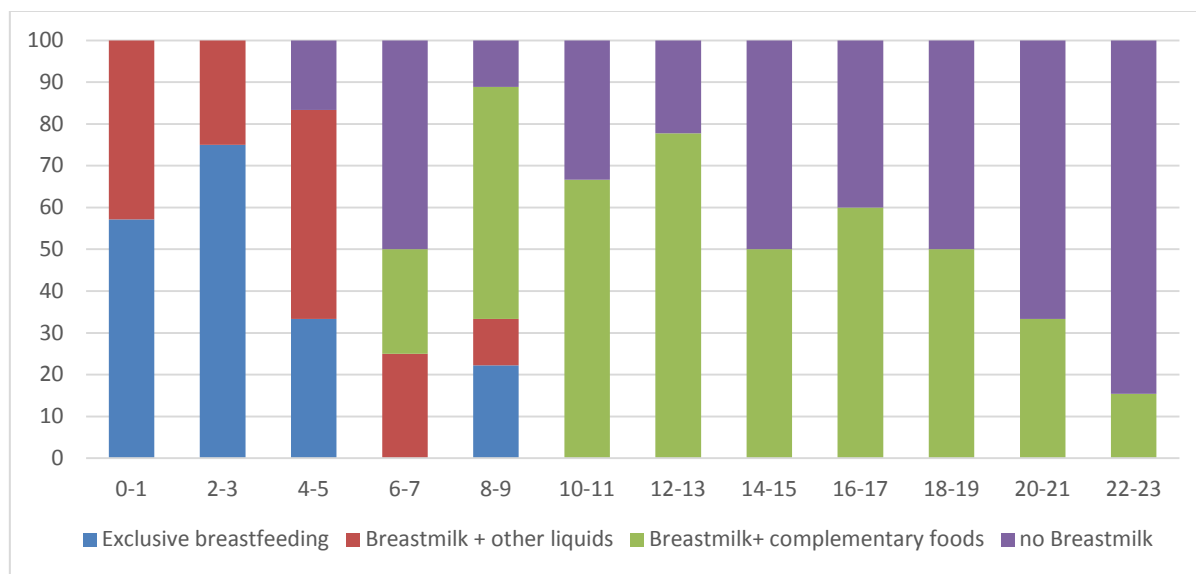
Population seems quite aware of this recommendation as 55.9% know about the appropriate timing for complementary feeding and the importance of extended breastfeeding up to 24 months (54.8%). However, they do not always put that knowledge into action. Indeed, figure below summarize the findings from a 24 hour recall diet among the U2 population and reveal that some children 6 months or older are still under exclusive breastfeeding or liquid based diet, this even until 9 months of age which very likely compromise their growth.

Timing of complementary feeding seem therefore to be one problem and only 46.2% of eligible children complied with international recommendation on that indicator. However, 62.5% were introduce semi-solid, solid or soft foods between 6-9 months which let us think that such food is introduced mostly around 8-9 months instead of 6 months.

With regards to continued breastfeeding, only 1 child out of 4 meets international recommendation to continue breastfeeding until 24 months (WHO indicator, 24.0%). Results seem to indicate weaning

ends mostly within the second year of the child's life as a much higher rate of 69.2% of continued breastfeeding at 1 year is observed (see figure 11).

Figure 11 : 24 hours recall diet summary of children aged 0 – 23 months living in the intervention area



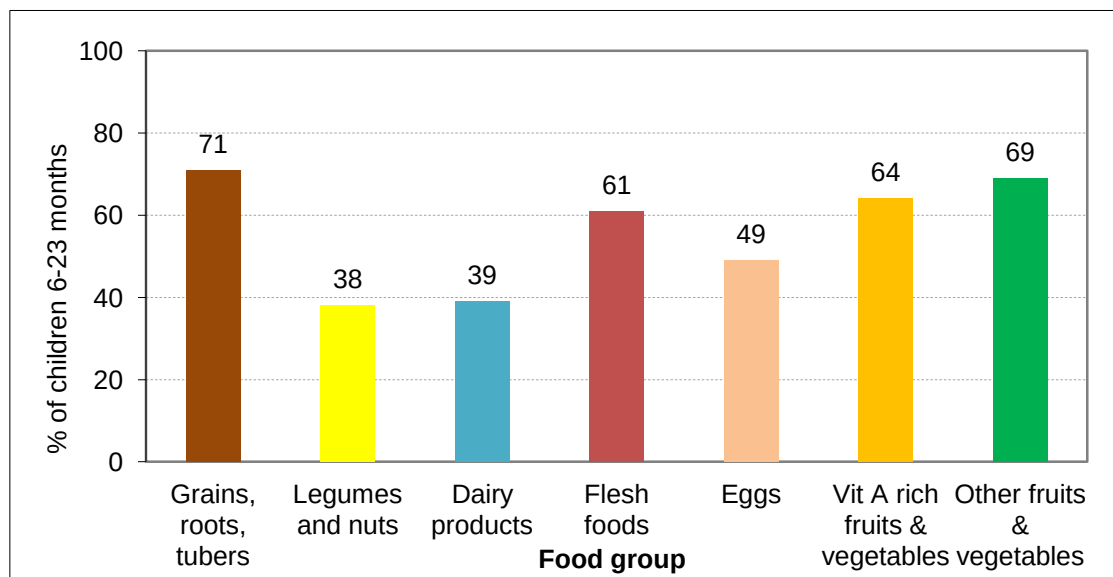
When looking more in detail into the complementary food, data showed that the overall proportion of children aged 6-23 months with a minimum acceptable diet was very low (37.1%).

This can mainly be attributed to the number of meal provided to the children although diet diversity could be improved. Indeed, if 65.3% of these children were having an adequate diet diversity, they were only 47.1% receiving a proper number of meal within a day (depending of age and breastfeeding). However, 64.8% of the children had consumed iron rich food and/or iron fortified food in the past 24h which is a positive sign since families seem to have access to such type of food and include it in the child's diet (figure 12).

With regards to the type food group, grains (mostly rice) appear to be the main component of children's diet, followed by fruit and vegetable (not vitamin A rich and vitamin A rich), flesh food, eggs, dairy product and legumes. These last 3 groups are consumed by less than 50% of the 6-23 months, although they are source of specific amino acid, calcium and proteins among others.

Diverse issues related to meal content and/or number is very likely to have an impact on children's growth and therefore be one of the determinant to the critical rate of chronic malnutrition observed in Kachin IDP camps.

Figure 12 : Percentage of children aged 6-23 months consuming items from each food group in the past 24 hours in the intervention area



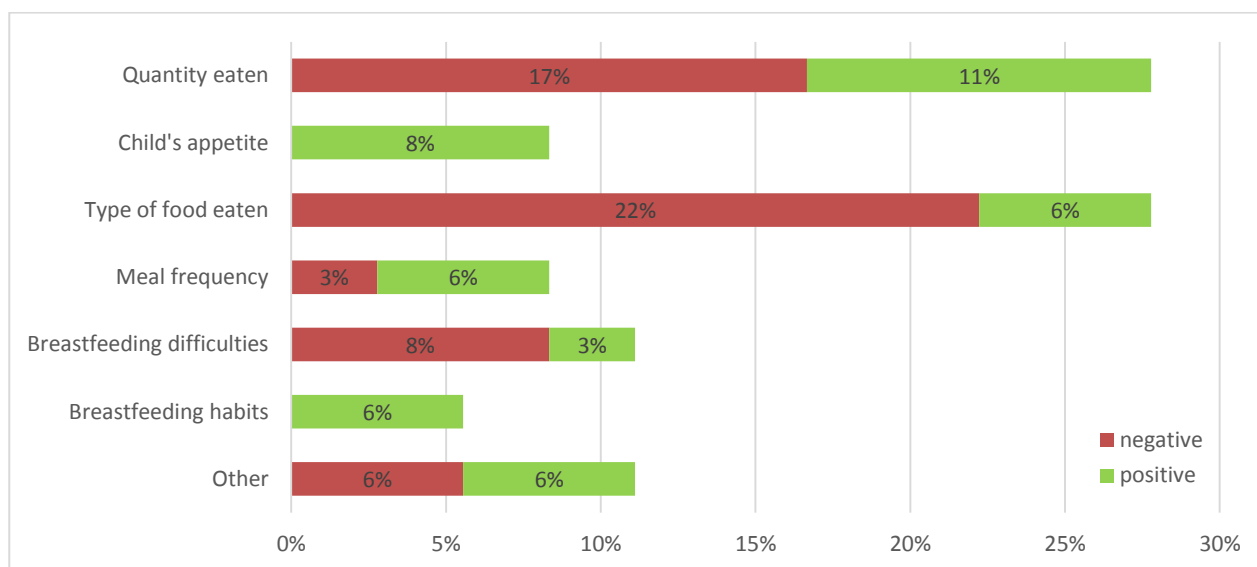
6.5 Crisis and feeding practices

Current conflict has change many aspects of Kachin families' lives from access to land, job, health care and food available at household level. However, not all these changes may impact negatively on U2 feeding practices as it is suggested by present findings.

Among families interviewed, the majority of them (61%) did not consider that the conflict had affected the way they were feeding their children. Among the 35% who did, 55% considered this impact as negative and 42% as positive.

Mixed perceptions were reported. Main negative effect noticed seem to be on the type of food and quantity eaten (influence complementary feeding and minimum acceptable diet) when 11% of the respondent found that quantity eaten had improve as well as the child appetite (more time available for the child, possible impact of food distribution). Detailed results are presented in below figure.

Figure 13 : Positive and negative changes in IYCF practices noticed by mothers and resulting from the conflict



Another negative impact of the conflict seem to be an increase in breastfeeding difficulties. With 8%, it is indeed the third main negative effect on U2 feeding according to caretakers. Results showed that one mother out of three had faced at least one breastfeeding problem with their young child, 4% still dealing with this issue at the time of the survey.

Figure 14 : Type of support provided to the mothers in order to overcome breastfeeding difficulty

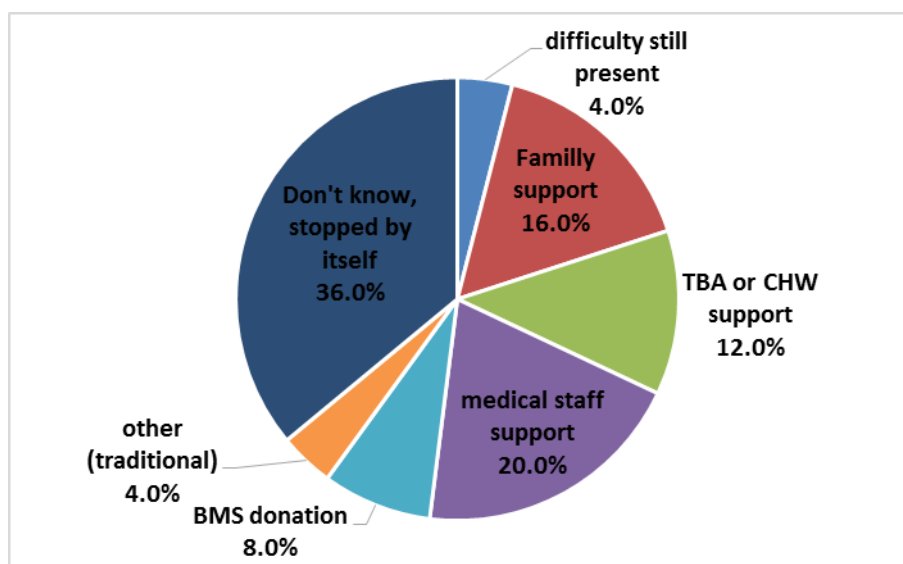


Figure 14 summarizes in which way these women overcame this situation. Although for the majority nothing specific was done to solve the issue (36%), medical staff and nurse seem to provide a significant support to the mothers, closely followed by family and TBA or community health workers (CHW). Although the nature of the breastfeeding difficulty was not mentioned, a concerning 8% of the mothers overcame the situation thanks to the donation and use of breastmilk substitute. More information should be collected on the topic if such alternative was adequate and harmless or not.

6.6 Impact of nutrition education

Nutrition education may help mother to deal with and even avoid breastfeeding difficulties and are sometimes conducted during ANC or PNC visits (see section 5). This assessment showed that 30% of the mothers had already participated to a nutrition education session on IYCF or other topics, which might explain that 52.7% of the respondent have an adequate knowledge of the 4 IYCF principles (see figure 9).

Their participation changed the way mothers were feeding their U2 child in 61% of the case as well as their diet (29%), workload (7%) or both (21%).

Interestingly, the main changes in U2 feeding practices was a diminution of breastfeeding difficulties (43%), an augmentation of mothers giving the colostrum or extending exclusive breastfeeding (14% each), extending overall breastfeeding (10%) or an improvement in child's meal content and knowledge on in complementary feeding (10%).

Knowledge acquired during the nutrition education sessions seem to motivate a change in diet and/or workload for 46% of the participants. However, 14% of the mother attending these same sessions did not change anything because they forgot or did not understood the discussion. Yet, main reason for the mother not to change their habits remains the lack of income (21%).

DISCUSSION/CONCLUSION

This assessment was conducted during the cold season where lowest rates of acute malnutrition are classically observed. Results for this survey are valid for all camps present in the 10 assessed townships and cannot be extrapolated to other townships.

Findings indicate that U5 population's main concern is with chronic malnutrition and not acute malnutrition. Indeed, results showed very low rates of acute malnutrition in Kachin IDP camps with GAM=1.9% (no SAM cases according WHZ). In addition, no acute malnutrition cases were found based on MUAC criteria. Underweight prevalence of 16.1% is far under critical threshold, with 6-29 months also 0.4 times more at risk ($p<0.05$) compared to children aged 30-59 months.

Although no statistical test could be performed, these results seem consistent with the NNC and the DoH 2012 survey findings, where less than 8% of U5 children were found at high risk of developing malnutrition, under 0.7 % were affected by SAM and 1% by MAM. In addition, underweight and stunting prevalence over the three assessed townships were respectively 24% and 39%.

No similar nutrition anthropometric survey has been conducted during rainy season (beginning in April-May), when malnutrition rates classically tend to increase, and there is therefore no conclusion to be drawn on how seasonality may affect children nutritional status and more specifically acute malnutrition. Yet generally, various humanitarian interventions including general food ration/blended food supply in conjunction with local context (access to market, health, job opportunities...) seem to be efficient to prevent children from falling into acute malnutrition.

Yet, such intervention do not solve the problem of chronic malnutrition. Indeed, overall prevalence is above the 40% WHO emergency threshold with 44.5% of the children affected by growth retardation. Younger children (6-29 months) seem also to be slightly more at risk to be affected by stunting than older children ($OR=0.37$, $p<0.001$), which is likely to be linked to camp's living condition and impact on diet since the U2 are likely to be born in camp. There is therefore an urgent need to tackle stunting and increase U5 children feeding practices in order to improve their overall nutritional status and health.

This is supported by findings on IYCF practices revealing issues on breastfeeding practices but also on complementary feeding practices, with still too many children U2 having inadequate timing, diet diversity and meal frequency. Though some behaviour might be the consequence of recent change in living conditions, loss of livelihood and trauma resulting from the displacement, cultural believes and/or lack of knowledge also seems to be involved. Overall IYCF activities need to be reinforced in the communities as a means to improve child nutrition and survival and prevent malnutrition. In addition, involvement of medical staff is important considering how they seem to be involved in some decision process, particularly when it comes to initiation of breastfeeding or exclusive breastfeeding.

Although IDP families benefit on a regular basis from general food distribution, it seem not to be sufficient to prevent children from being affect by chronic malnutrition. If the use of the food ration may certainly be maximized, improvement of diet content may also play a significant role particularly in long term. Access to market not being a problem, the lack of income and sometimes knowledge on the importance and specificity of food diversification is likely to be the main limiting factors to proper complementary feeding. On the other hand, increasing household income by creating job opportunities may also have adverse effects on breastfeeding practices and overall IYCF practices if it requires the mother of U2 leaving the house for a long period of time without any mechanism to protect IYCF.

From a health perspective, diarrhoea incidence and above all ARI incidence are a concern but may be linked to the winter season and are not significant risk factors for acute malnutrition at that time of the year (may change during rainy season). However, hygiene sensitization may impact on occurrence of both disease. Diarrhoea and ARI are also known to be linked to increase the risk of stunting when not properly and rapidly treated and you should be carefully monitored.

Measles coverage is satisfactory and meet minimum standard (80%) but an additional effort is needed to ensure that IDP camps meet the 90% coverage advised by WHO. Vitamin A supplementation coverage of 45.3% among U5 children is insufficient. Strengthening of local health facilities' capacity or global mass immunization/supplementation campaign in all IDP camps would help raising both coverage.

In conclusion, current effort and services should be maintained since assistance deployed so far has been proved effective in preventing deterioration of U5 children nutritional status, maintaining low prevalence of acute malnutrition. Considering the alarming rate of stunting, an intervention in public health nutrition and food security is require to tackle this chronic malnutrition problem with the aim of improving household capacity to diversify their diet therefore improving U2 complementary feeding while making sure positive breastfeeding practices are protected and encouraged.

RECOMMENDATIONS

- To maintain General Food Distribution (GFD) in IDP communities including Rice Soya Blend (RSB) ration for all Pregnant and lactating women (PLW) and children under 2 to prevent deterioration of their nutritional status. Inclusion of children 24-59 months old would allow to partially address the chronic malnutrition problem present in the area, particularly in NCA where GFD is not fortified.
- To look at other more long term, sustainable and development oriented strategy in micronutrient supplementation for the whole family, considering the critical rate of stunting, in order to prevent further deficiencies in U5 and elder children.
- To develop cash based interventions or income generating activities carefully designed to empower families including women and increase household income while preserving and promoting positive IYCF practices. Activities such as cash-for-breastfeeding, particularly for the period 0-5 months of age should be considered.
- To increase knowledge on IYCF through intervention also covering breastfeeding support and other IYCF related activities in camps focused though not restricted to mothers of U2 and pregnant women. This should indeed target as well other key decision maker than mothers such as medical staff, nurses and midwives who seem to play a major role in breastfeeding practices. Furthermore, a specific strategy compatible with family social and economic needs should be designed in order to improve continued breastfeeding rate up to 2 years of age.
- To complete this intervention with a set of cooking demonstration to maximize the use of the GFD and RSB in order to increase micronutrient intake among children U5 and put into practice knowledge acquired on complementary feeding during IYCF sensitization session. This should be implemented in coordination with other relevant actors.
- To promote the use of ANC and PNC services when available in the area. Promotion of positive IYCF practices during visits should be ensured (training of relevant staffs).
- To train key persons in camp and medical staffs on identification of SAM cases (full measurement) and local recipes for treatment while ensuring that a proper support in care practices and IYCF is provided to the family. Considering the low GAM rate, a Therapeutic Feeding Programme (TFP) is not a viable option.
- To conduct a mass immunization, deworming and supplementation of the affected population to improve current coverage and prevent disease's outbreak such as measles or polio.
- To monitor the nutritional situation in 6 months (rainy season and pick period of acute malnutrition) through another SMART assessment in IDP camps in order to establish the impact of seasonality on acute malnutrition. Morbidity and diet diversity should also be reassessed at that time.

ANNEXES

Annexe 1: Survey planning and household selection

Township	camp name	nHH	DAY n°	team N°
Myitkyina	Tat Kone Galile Baptist Church	4	DAY 1	team 1
Myitkyina	Tot kong Baptist Church	6		
Myitkyina	Tat Kone San Pya Baptist Church	8		
Myitkyina	Maliyang Baptist Church	9	DAY 1	team 2
Myitkyina	Le kone Bethlehem Church	9	DAY 1	team 3
Myitkyina	Du Kahtawng Qtr 4,5,14	9		
Myitkyina	Man Hkring Baptist Church	12		
Myitkyina	Le Kone Ziun Baptist Church	16	DAY 1	team 4
Myitkyina	Kyun Pin Thar Baptist Church	6	DAY 1	team 5
Myitkyina	Njang Dung Baptist Church	3		
Myitkyina	Shatapru Sut Ngai Tawng	12		
Myitkyina	Jan Mai kawng Baptist Church	18	DAY 1	team 6
Myitkyina	Jan Mai kawng Baptist Church	9	DAY 3	team 6
Myitkyina	Shwe Zet Baptist Church	11		
Wainmaw	Shing Jai	10	DAY 3	team 1
Waimaw	Qtr.2 Myoma Baptist Church	11	DAY 3	Team 3
Waimaw	Maina Lawang Baptist Church	5		
Waimaw	Mading Baptist Church	2		
Waimaw	Maina KBC (Bawng Ring)	20	DAY 3	team 4
Waimaw	Maina KBC (Bawng Ring)	20	DAY 3	team 5
Wainmaw	Zai Awng / Mung Ga Zup	18	DAY 4	team 2
Wainmaw	Hkau Shau (BP 12)	24	DAY 5	team 1
Wainmaw	Zai Awng / Mung Ga Zup	20	DAY 5	team 2
Bhamo	Htoi San Church	1	DAY 5	team 3
Bhamo	Phan Khar Kone	2		
Bhamo	Robert Church	18		
Bhamo	Robert Church	21	DAY 5	team 4
Bhamo	Robert Church	21	DAY 5	team 5
Mogaung	Kyun Taw Baptist Church	2	DAY 5	team 6
Mogaung	Nat Gyi Kone Baptist Church	2		
Wainmaw	Zai Awng / Mung Ga Zup	20	DAY 6	team 2
Momauk	Loi Je Baptist Church	12	DAY 6	team 3
Momauk	Momauk Baptist Church	20	DAY 6	team 4
Momauk	Momauk Baptist Church	20	DAY 6	team 5
Hpakan (Ka Mai)	Hlaing Naung Baptist	1	DAY 6	team 6
Wainmaw	Pajau / Jan Mai	23	DAY 7	team 1
Momauk	Loi Je Lisu Camp	6	DAY 7	team 3
Momauk	Seng Ja (Loi Je)	6		
Mansi	Mansi Baptist Church	14	DAY 7	team 4
Shwegu	Shwe Gu Baptist Church	7	DAY 7	team 5
Hpakan	Baptist Church, Hmaw Si Sar	6	DAY 7	team 6
Hpakan	Yumar Baptist Church	1		
Chipwi	Hpare Hkyer - BP6 (+TRAVEL)	6	DAY 8	team 2
Hpakan	5 Ward Baptist Church(lon Khin)	14	DAY 8	team 6

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Annexe 2: Event calendar – English version (approximate translation from Myanmar)

EVENTS CALENDAR - IDP camps in Kachin State, December 2013							
Seasons (myanmar)	Seasons	Religious celebration	Other event	Disaster/ Hazard	Local Event	Month/Year	Age (month)
□□□□□□	Winter	200 years anniversary celebration for Judson (the whole Myanmar Baptist Convention MBC) 1st and 2nd week of December, Christmas day 25 December	Most of camp leaders under KBC shall be very busy for the Christmas for the whole month, Picking season of mustard bud, World AIDS Day	Conflict unresolved	Normally, state government organized Public walking event during December and January, Public sport movement	December 2013	0
□□□□□□	Winter	Thanks Giving Day, Full Moon Day of Ta Zaung Mone, Cemetery Cleansing Ceremony (Roman Catholic)	Harvesting time	Conflict unresolved	Shan New Year, New crops celebration	November 2013	1
□□□□□□	Winter	Fruit eating festival, Thadingyut festival, Depavili	Time for poppy cultivation, Corn harvesting time	Conflict unresolved	Shan New Year	October 2013	2
□□□□□□□□	End of rainy season	The religious festival (Taking sabbath every week, monk did not travel outside the monastery), Starting Muslim fasting period		Conflict unresolved	Chinese Moon Cake Festival	September 2013	3
□□□□	Rainy Season	The beginning of religious festival (Taking sabbath every week, monk did not travel outside the monastery)	Time for paddy cultivation	Conflict unresolved		August 2013	4
□□□□	Rainy Season		Preparation for paddy cultivation, Martyrs' Day	Conflict unresolved	Paying Homage to Aged	July 2013	5
□□□□□□□□□□	Rainy Season	Chinese medicine day, Children's day, Father's day (third week, Sunday)	June 26 (Int'l Day for ban on the Drugs Illicit ...)	Conflict unresolved	Civil war broke between KIA and Military, Paddy cultivation	June 2013	6
□□□□□□□□	Summer	Mother's day (second week, Sunday), Full moon day of Kason, Payer Day (Roman Catholic)	May Day (Worker's Day), Time for seasonal fruits like Chinese plum and mangosteen	Conflict unresolved	Paddy cultivation	May 2013	7
□□□□□□□□	Summer	Kachin national wishing day (to wish for the refugees of conflict/ civil war), Bible Contest Day, Easter Sunday, Prayer Day (Roman Catholic)	Thingyan (water festival), April Fool, To pluck tea leaf, Hta Ma Hne' festival	Conflict unresolved	Cemetery cleaning festival (paying homage to ancestors), Paddy cultivation	April 2013	8
□□□□□□□□	Summer	Youth Summer camps, Holy childhood education, Burying firewood to keep warm (Christian), Full Moon Day of Tabaung, Pagoda festival of reclining Buddha in Moe Kaung	Last month of Myanmar government fiscal year, Final exam for matriculation students, Peasant's Day	Conflict unresolved		March 2013	9
□□□□□□□□□□	Spring		Union Day, Chinese New Year Day, St. Valentine's Day, Preparation for plantation, Final exam for the student of Basic Education	Conflict unresolved	Kachin Revolution Day	February 2013	10
□□□□□□	Winter		New Year Day, Independence Day	Conflict unresolved	Kachin State Day, Manaw festival	January 2013	11
□□□□□□	Winter	Christmas (25)	World AIDS day			December 2012	12

□□□□□□	Winter	Thank Giving Day, Full Moon Day of Ta Zaung Mone, Cemetery Cleansing Ceremony (Roman Catholic)	Harvesting time	Conflict unresolved	Shan New Year, New crops celebration	November	2012	13
□□□□□□	Winter	Thank Giving Day, Full moon day of Ta Zaung Mone, Thadingyut festival	Time for poppy cultivation, Corn harvesting time	Conflict unresolved	Shan New Year, New crops celebration	October	2012	14
□□□□□□□□	End of rainy season	The religious festival (Taking sabbath every week, monk did not travel outside the monastery), Starting Muslim fasting period		Conflict unresolved	Chinese Moon Cake Festival	September	2012	15
□□□□	Rainy Season	The beginning of religious festival (Taking sabbath every week, monk did not travel outside the monastery)	Time for paddy cultivation	Conflict unresolved		August	2012	16
□□□□	Rainy Season		Martyrs' Day, Preparation for paddy cultivation	Conflict unresolved	Paying Homage to Aged	July	2012	17
□□□□□□□□□□	Rainy Season	Chinese medicine day, Children's Day, Father's Day (third week, Sunday)	June 26 (Int'l Day for ban on the Drugs Illicit ...)	Conflict unresolved	Paddy cultivation	June	2012	18
□□□□□□□□	Summer	Mother's day (second week, Sunday), Full moon day of Kason, Payer Day (Roman Catholic)	May Day (Worker's Day), Time for seasonal fruits like Chinese plum and mangosteen	Conflict unresolved	Paddy cultivation	May	2012	19
□□□□□□□□	Summer	Thin Gyan (water festival), Kachin national wishing day (to wish for the refugees of conflict/civil war) Bible Contest Day, Easter Sunday, Prayer Day (Roman Catholic)	April Fool, To pluck tea leaf, Hta Ma Hne` festival	Conflict unresolved	Cemetery cleaning festival (paying homage to ancestors), Paddy cultivation	April	2012	20
□□□□□□□□	Summer	Ta Baung Festival □ burying firewood to keep warm (Christian), (End of Muslim fasting period), Full Moon Day of Tabaung, Pagoda festival of reclining Buddha in Moe Kaung	Peasant's Day, To milk the poppy bud	Conflict unresolved	Burying farm/field to prepare for plantation	March	2012	21
□□□□□□□□□□	Spring	Kachin Revolution Day, Making fireplace in front of God (to keep warm as it is coldest time of the year)	Union Day, Chinese New Year Day, St. Valentine's Day, Preparation for plantation, Final exam for the student of Basic Education	Conflict unresolved	Kachin Revolution Day, Shan National day	February	2012	22
□□□□□□□□	Winter		Independence Day, New Year Day	Conflict unresolved	Ka Chin State Day, Ka Yin New Year	January	2012	23
□□□□□□	Winter	Christmas (25)	World AIDS day			December	2011	24
□□□□□□	Winter	Thank Giving Day, Full moon day of Ta Zaung Mon		Conflict unresolved	Shan New Year, New crops celebration	November	2011	25
□□□□□□□□□□	Autumn	Fruit eating festival, Ta Din Gyt festival, Ta Zaung Tainh Festival, Denavili	Time for poppy cultivation, Corn harvesting time	Conflict unresolved	Shan New Year	October	2011	26
□□□□□□□□	End of rainy season	The religious festival (Taking sabbath every week, monk did not travel outside the monastery), Starting Muslim fasting period		Conflict unresolved	Chinese Moon Cake Festival	September	2011	27
□□□□	Rainy Season	The beginning of religious festival (Taking sabbath every week, monk did not travel outside the monastery)		Conflict unresolved		August	2011	28
□□□□	Rainy Season		Martyrs' Day	Conflict unresolved	Paying Homage to Aged	July	2011	29

□□□□	Rainy Season	Chinese medicine day, children's day, Father's day (third week, Sunday)		Conflict outbroken	Civil war broke between KIA and Military Paddy plantation	June 2011	30
□□□□□□	Summer	Mothers' day (second week, Sunday), Full moon day of Kason	May Day (worker)		Paddy plantation	May 2011	31
□□□□□□	Summer	Thin Gyan (water festival), Kachin national wishing day (to wish for the refugees of conflict/civil war) □ Hta Ma Hne festival	April Fool, Easter Sunday, To pluck tea leaf		Cemetery cleaning festival (paying homage to ancestors) □ Paddy plantation	April 2011	32
□□□□□□	Summer	Ta Baung Festival □ burying firewood to keep warm (Christian) (Full moon day of Ta Baung), (End of Muslim fasting period)	Peasant's Day, To milk the poppy bud		Burying farm/field to prepare for plantation	March 2011	33
□□□□□□□□	Autumn	Ka Chin Revolution day, Making fireplace in front of God (to keep warm as it is coldest time of the year)	Union Day		Chinese New Year, Shan National day	February 2011	34
□□□□□□	Winter	New Year Day (English Calendar)	Independant Day		Ka Chin State day(10), Ka Yin New Year	January 2011	35
□□□□□□	Winter	Christmas (25)	World AIDS day			December 2010	36
□□□□□□	Winter	Thank Giving Day, Full moon day of Ta Zaung Mon			Shan New Year, New crops celebration	November 2011	37
□□□□□□□□	Autumn	Fruit eating festival, Ta Din Gyt festival, Ta Zaung Tainh Festival, Denavili	Time for poppy cultivation, Corn harvesting time		Shan New Year	October 2010	38
□□□□□□□□	End of rainy season	Moon cake festival			Chinese Moon Cake Festival	September 2010	39
□□□□	Rainy Season					August 2010	40
□□□□	Rainy Season		Martyrs' Day		Paying Homage to Aged	July 2010	41
		Chinese medicine day, children's day, Father's day (third week, Sunday)			Paddy plantation	June 2010	42
□□□□□□	Summer	Mothers' day (second week, Sunday), Full moon day of Kason	May Day (worker)		Paddy plantation	May 2010	43
□□□□□□	Summer	Thin Gyan (water festival), Kachin national wishing day (to wish for the refugees of conflict/civil war) □ Hta Ma Hne festival	April Fool, Easter Sunday □ To pluck tea leaf		Opening Ceremony of Church in Kutkai, Cemetery cleaning festival (paying homage to ancestors) □ Paddy plantation	April 2010	44
□□□□□□	Summer	Ta Baung Festival □ burying firewood to keep warm (Christian) (Full moon day of Ta Baung), (End of Muslim fasting period)	Peasant's Day, To milk the poppy bud		Burying farm/field to prepare for plantation	March 2010	45
□□□□□□□□	Autumn	Ka Chin Revolution day, Making fireplace in front of God (to keep warm as it is coldest time of the year)	Union Day		Chinese New Year, Shan National day	February 2010	46
□□□□□□	Winter	New Year Day (English Calendar)	Independant Day		Ka Chin State day(10), Ka Yin New Year	January 2010	47
□□□□□□	Winter	Christmas (25)	World AIDS day			December 2009	48
□□□□□□	Winter	Thank Giving Day, Full moon day of Ta Zaung Mon			Shan New Year, New crops celebration	November 2009	49
□□□□□□□□	Autumn	Fruit eating festival, Ta Din Gyt festival, Ta Zaung Tainh Festival, Denavili	Time for poppy cultivation, Corn harvesting time		Shan New Year	October 2009	50
□□□□□□□□	End of rainy season	The religious festival (Taking sabbath every week, monk did not travel outside the monastery), Starting Muslim fasting period			Chinese Moon Cake Festival	September 2009	51
□□□□	Rainy Season	The beginning of religious festival (Taking sabbath every week, monk did not travel outside the monastery)				August 2009	52
□□□□	Rainy Season		Martyrs' Day		Paying Homage to Aged	July 2009	53

		Chinese medicine day, children's day, Father's day (third week, Sunday)			Paddy plantation	June 2009	54
□□□□□□	Summer	Mothers' day (second week, Sunday), Full moon day of Kason	May Day (worker)		Paddy plantation	May 2009	55
□□□□□□	Summer	Thin Gyan(water festival), Kachin national wishing day (to wish for the refugees of conflict/ civil war) □ Hta Ma Hne festival	April Fool, Easter Sunday □ To pluck tea leaf		Cemetery cleaning festival (paying homage to ancestors) □ Paddy plantation	April 2009	56
□□□□□□	Summer	Ta Baung Festival □ burying firewood to keep warm (Christian)(Full moon day of Ta Baung), (End of Muslim fasting period)	Peasant's Day, To milk the poppy bud		Palaung ethnic assembly, Burying farm/field to prepare for plantation	March 2009	57
□□□□□□□□	Autumn	Ka Chin Revolution day, Making fireplace in front of God (to keep warm as it is coldest time of the year)	Union Day		Chinese New Year, Shan National day	February 2009	58
□□□□□□	Winter	New Year Day (English Calendar)	Independant Day		Ka Chin State day(10), Ka Yin New Year	January 2009	59
□□□□□□	Winter	Christmas (25)	World AIDS day			December 2008	60
□□□□□□	Winter	Thank Giving Day, Full moon day of Ta Zaung Mon			Shan New Year, New crops celebration	November 2008	61
□□□□□□□□	Autumn	Fruit eating festival, Ta Din Gyt festival, Ta Zaung Tainh Festival Denavili	Time for poppy cultivation, Corn harvesting time		Shan New Year	October 2008	62
□□□□□□□□	End of rainy season	The religious festival (Taking sabbath every week, monk did not travel outside the monastery), Starting Muslim fasting period			Chinese Moon Cake Festival	September 2008	63
□□□□	Rainy Season	The beginning of religious festival (Taking sabbath every week, monk did not travel outside the				August 2008	64
□□□□	Rainy Season		Martyrs' Day		Paying Homage to Aged	July 2008	65
		Chinese medicine day, children's day, Father's day (third week, Sunday)			Paddy plantation	June 2008	66
□□□□□□	Summer	Mothers' day (second week, Sunday), Full moon day of Kason	May Day (worker)		Paddy plantation	May 2008	67
□□□□□□	Summer	Thin Gyan(water festival), Kachin national wishing day (to wish for the refugees of conflict/ civil war) □ Hta Ma Hne festival	April Fool, Easter Sunday □ To pluck tea leaf		Cemetery cleaning festival (paying homage to ancestors) □ Paddy plantation	April 2008	68
□□□□□□	Summer	Ta Baung Festival □ burying firewood to keep warm (Christian)(Full moon day of Ta Baung), (End of Muslim fasting period)	Peasant's Day, To milk the poppy bud		Burying farm/field to prepare for plantation	March 2008	69
□□□□□□□□	Autumn	Ka Chin Revolution day, Making fireplace in front of God (to keep warm as it is coldest time of the year)	Union Day		Chinese New Year, Shan National day	February 2008	70
□□□□□□	Winter	New Year Day (English Calendar)	Independant Day		Ka Chin State day(10), Ka Yin New Year	January 2008	71
□□□□□□	Winter	Christmas (25)	World AIDS day			December 2007	60
□□□□□□	Winter	Thank Giving Day, Full moon day of Ta Zaung Mon			Shan New Year, New crops celebration	November 2007	61
□□□□□□□□	Autumn	Fruit eating festival, Ta Din Gyt festival, Ta Zaung Tainh Festival Denavili	Time for poppy cultivation, Corn harvesting time		Shan New Year	October 2007	62

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Annexe 3 : SMART Questionnaire – English version

ANTHROPOMETRIC QUESTIONNAIRE - IDP population, Kachin State, December 2013																		
Date :		Camp/area name :				HH N°:				Team N° :								
ID	HH	Gender	Date of Birth	Age	Weight ±100g	Height ±0.1cm	Edema	MUAC ±1mm	Received Vitamin A caps within the last 6 months? (show sample)	Diarrhoea the last 15 days?	Received ORS (or similar) to treat diarrhoea? With zinc? (show samples)	Acute Respiratory Infection (ARI) the last 15 days?	Taken to health provider and/or receive treatment for ARI ?	Measle vaccination?	Do you receive the food ration?	Did you face a gap in food distribution in the last 12 months?	How many time did that gap occurred the last 12 months?	How long did this food gap last in average ?
N°	N°	M/F	dd/mm/yyyy	Month	Kg (00.0)	cm (000.0)	N = No Y = Yes	mm (000)	0=No 1=Yes 4=Doesn't know	0=No 1=Yes 4=Doesn't know	0=No 1=Yes/ORS 2=Yes/ORS+zinc 4=Doesn't know	0=No 1=Yes 4=Doesn't know	0=No 1=Facility/ treatment 2=Facility no treatment 4=Doesn't know	0=No 1 = Yes/card 2=Yes/no card 4=Doesn't know	0=No 1=Yes 4=Doesn't Know	0=No 1=Yes 4=Doesn't Know	N	days
1																		
2																		
3																		
4																		
5																		
6																		
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34																		
35																		

Diarrhea case definition: 3 or more liquid stools per day
ARI case definition: Fever and at least one of the following : rhinitis, cough, redness or soreness of throat
OR Fever and fast breath (> 50 breaths/min) and at least one of the following : cough, difficulty in breathing

Annexe 4 : KAP Questionnaire – English version

Feeding QUESTIONNAIRE Children 0-23 months

Camp _____ Interviewer ID _____ Result _____ (1=complete; 2= partially complete; 3=refused to take the survey, 4=Absent)

Date of Interview ____/____/____ Unique Serial number _____ Household Number ____ ____ Child Number ____ ____
DD MM YY

Assessing IYCF behaviors, assign unique numbers to each household and child.

This questionnaire is designed for *all* children in the household who are less than 24 months of age – that is, the child has not yet reached his/her 2nd birthday. This includes other children from the same mother as well as children from other caregivers in the same household. Once you have completed the survey for one child, use a separate form for each and every other child less than 24 months of age who lives in the same household. You should complete a FULL questionnaire for EACH child under 2 years of age.

My name is _____ We are conducting a survey with SCI. The purpose of the survey is to gather information from you about how (MOTHER/YOU) feed (YOUR) infants and young children. Your responses will help us understand the realities of IYCF nutrition in (VILLAGE NAME) and design interventions that are specifically tailored to women and children here.

I will ask you some questions, which I have prepared. If you do not want to answer a question, you do not have to.

All your answers will be kept confidential and your name will not be identified with the information you provide. Do you agree to participate in this survey?

Wait for the oral consent of the person and then start the questionnaire.

AGREED ?

YES

NO

SECTION 1: BACKGROUND

Make every effort to speak with the mother. If she is not available, speak with the primary caregiver responsible for feeding of the child.

Are there any children in the household who have not had their 2nd birthday? If YES, identify the mother/primary caregiver and continue:

What is your youngest child's name? _____ [Use this NAME in remaining questions] **please get his/her card.**

If there is more than 1 child under 2 years of age in the household, identify each child's mother or primary caregiver and arrange to interview her once the first interview is completed. After you have completed the questionnaire for the first child, repeat the entire interview for the 2nd child, substituting the correct NAME for this child.

1.	Date of birth of child [There are various sources for documenting date of birth of child including identification cards, health or immunization cards, birth certificates and baptismal certificates. Copy date of birth from one of these sources, if available. If there is no document showing the child's DOB, ask the mother if she knows the child's DOB. Record her response. If you cannot obtain DOB from a card or the mother, you will need to skip to question 3 and ask the mother how old the child is.]	____/____/____ DD MM YY		
2.	Source for date of birth ['Card' could be an identification card, a health or immunization card, a birth certificate or a baptismal certificate.]	1 2 8	Card -----→ Caregiver -----→ Don't know -----→	
2b	Was the child register at birth?	1 0 8	Yes No Don't know	
3.	How many months old is [NAME]? Since all children should be between 0 and 23 months of age. If the child has completed 2 years on his or her last birthday, the child is older than the age range for the survey. Thank the mother and terminate the interview.	_____ MONTHS		
4.	Sex of child	1 2	Boy Girl	

SECTION 2: FEEDING HISTORY

#	Question	Code		Action
5.	Sometimes babies are fed breastmilk in different ways; for example, the baby may be breastfed by his/her mother or given breastmilk by spoon, cup or bottle. Giving breastmilk from a spoon, cup or bottle may happen when the mother cannot always be with her baby. Sometimes babies are breastfed by another woman, or given breastmilk from another woman by spoon, cup or bottle or some other way. This can happen if a mother cannot breastfeed her own baby. Has [NAME] ever consumed breastmilk in any of these ways?	1 0 8	Yes No DK	Go to 6 Go to 7 Go to 7

6.	How long after birth did you first put [NAME] to the breast? If respondent reports she put the infant to the breast immediately after birth, circle IMMEDIATELY. If less than 1 hour, write '00' for hours. If 1-24 hours, record number of completed hours from 1 to 23. Otherwise, record number of completed days. If the respondent doesn't know, circle 'Don't know.'	→ → → 99	Immediately OR Hours __ __ OR Days __ __ Don't know	Go to (7)
6b	What was the main reason to put [NAME] to the breast after that time?	1 2 3 4 5 8	Early initiation of breastfeeding is good for my baby Colostrum is bad for my baby My baby had to drink something else before he can receive breast milk I was sick and could not breastfeed my baby Other, specify _____ I don't know	
6c	Who decided about when [NAME] could be breastfed?	1 2 3 4 5 6	I did My mother / mother in law did My husband did The Traditional Birth Attendant (TBA) did The nurse or other medical person did Other, specify _____	
7	In the first 3 days after delivery, was [NAME] given anything to drink other than or in addition to breastmilk? If yes, circle ALL items that are reported. Simply record all liquids mentioned. Do not read the list of possible responses.	0 1 2 3 4 5	Nothing Plain water Sugar water or glucose water Powdered or fresh animal milk Infant formula (add locally available brand names) Other (specify) _____	Go to(8)
7b	What was the main reason to give something else to [NAME]?	1 2 3 4 5 6 7 8	It is better for my baby My baby had to drink something else before he can receive breast milk My baby was thirsty I don't have enough milk, milk not nutritious enough My baby was sick I was sick and could not breastfeed my baby Other, specify _____ I don't know	

7c	Who decided about it?		1	I did		
			2	My mother / mother in law did		
			3	My husband did		
			4	The Traditional birth attendant (TBA) did		
			5	The nurse or other medical person did		
			6	Other, specify _____		
8.	Yesterday during the day or at night, did [NAME] consume breastmilk from you or another woman, or did anyone give [NAME] breastmilk using a spoon, cup or bottle?		1	Yes		
			0	No		
			8	Don't know		
9.	Now I would like to ask you about liquids that [NAME] may have had yesterday during the day and at night. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] receive any of the following? Ask about every liquid. If item was given, circle '1.' If item was not given, circle '0.' If caregiver doesn't know, circle '8.' Every line must have a code.					
		Category	LAST 24 HOURS			How many times yesterday during the day or night did [NAME] consume the item?
			Y	N	DK	
	a	Vitamin drops or other medicines as drops	1	0	8	
	b	ORS	1	0	8	
	c	Plain water	1	0	8	
	d	Infant formula (Dumex, china brand, donation...)	1	0	8	___ times
	e	Milk such as tinned, powdered, or fresh animal milk (Cow Milk, Miko, China Brand Milk)	1	0	8	___ times
	f	Juice or juice drinks (Plum, Pineapple, Lemon/lime, ... China Brand Juice)	1	0	8	
	g	Clear broth or other soup (Pumpkin, Tarot, Lentils, Mustard leave, Corn, bean soup...)	1	0	8	
	h	Other water-based liquids (rice water, green tea, honey and water, coffee mix, soybean with water, traditional medicine...)	1	0	8	
	i	Sour milk or yogurt (Soybean milk)	1	0	8	___ times
	j	Thin porridge	1	0	8	
10.	Please tell me everything that [NAME] ate yesterday during the day or night (whether at home or outside the home). Think about when [NAME] first woke up yesterday. Did [NAME] eat anything at that time? Keep probing 'Anything else?' until the respondent says 'nothing else.' If nothing else was given when the child first got up, ask: What did [NAME] do after that? Did [NAME] eat anything at that time? If yes, ask: Please tell me everything [NAME] ate at that time. Probe: 'Anything else?' until respondent says 'nothing else.'			If at least one food from the food group has been given in the past 24 hours, circle 'Y' in the column below. If no food in a food group has been given, circle 'N.' If the respondent doesn't know, circle 'DK.'		

If respondent mentions mixed dishes like a sauce or stew, probe: What ingredients were in that [MIXED DISH]? Probe: ‘Anything else?’ Until respondent says ‘nothing else.’ If foods are used in small amounts for seasoning or as a condiment, include them under the condiments food group. Repeat questions above until respondent says the child went to sleep until the next day. <i>INSTRUCTIONS for RECORDING RESPONSES</i> As the respondent recalls each food, <u>underline</u> the food in the food group below. If a food recalled by the respondent is not listed in any of the food groups below, write the food in the box labeled ‘other foods’ at the end of this section. Once the respondent tells you everything s/he remembers the child eating yesterday during the day or at night, look at each food group. If one or more foods in a food group is underlined, circle ‘Y’ in the column to the right. Now return to the list of foods. Are there any food groups with no ‘Y’ circled? Read the entire list of food items in that line to the respondent. If s/he indicates that one or more of the foods has been given to the child, underline that food and circle ‘Y.’ If none of the foods has been given to the child, circle ‘N.’ If the mother does not remember or does not know, circle ‘DK.’ Every line must have a code.					
#	Category		LAST 24 HOURS		
			Y	N	DK
	aa	Bread, rice, noodles, or other foods made from grains, including thick grain-based porridge?	1	0	8
	bb	White potatoes, white yams, manioc, cassava, or any other foods made from roots?	1	0	8
	cc	Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside?	1	0	8
	dd	Any foods made from beans, peas, lentils or nuts, including Plumpy ‘nut/Ee Zee paste?’	1	0	8
	ee	Any dark green leafy vegetables?	1	0	8
	ff	Ripe mangoes, ripe papayas ?	1	0	8
	gg	Any other fruits or vegetables?	1	0	8
	hh	Liver, kidney, heart or other organ meats?	1	0	8
	ii	Any meat such as beef, pork, lamb, goat, chicken or duck?	1	0	8
	jj	Fresh or dried fish, shellfish, or seafood?	1	0	8
	kk	Grubs, snails or insects?	1	0	8
	ll	Eggs?	1	0	8
	mm	Cheese, yogurt, or other milk products?	1	0	8
	nn	Any oil, fats or butter, or foods made with any of these?	1	0	8
	oo	Foods made with red palm oil, red palm nut and red palm nut pulp sauce?	1	0	8
	pp	Any sugary foods such as chocolates, sweets, candies, pastries, cakes or biscuits?	1	0	8
	qq	Condiments for flavor such as chilies, spices, herbs or fish powder?	1	0	8

	Other foods: please write down other foods in this box that the respondent mentioned but are not in the list above. When data are entered into the computer, the other foods will be assigned to one of the 7 categories of foods:			
11.	How many times did [NAME] eat solid, semi-solid or soft foods other than liquids yesterday during the day or at night? Small snacks and small feeds such as one or two bites of mother's or sibling's food should not be counted. If caregiver answers 7 or more times, record 7. If she/he doesn't know, record 88.	_____	Times	
12.	Now I would like to ask you about other foods [NAME] may eat. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or night, did [NAME] consume any "nutritious food" (Rice Soy Blend, RSB) from WFP?	1 0 8	Yes No Don't know	
13.	Yesterday, during the day or night, did [NAME] consume any food to which you added a powder or sprinkles like this? Show picture of micronutrients sprinkles with packaging.	1 0 8	Yes No Don't know	
14.	Yesterday, during the day or night, did [NAME] consume any Plumpy'nut/EeZee Paste ? Show pictures of PPN and EeZeePaste.	1 0 8	Yes No Don't know	
15.	Yesterday, during the day or night, did [NAME] consume any Dumex, China Brand, ...?	1 0 8	Yes No Don't know	
16.	Did [NAME] drink anything from a bottle with a nipple yesterday or last night?	1 0 8	Yes No Don't know	
17.	Have you ever experienced breastfeeding difficulty with NAME	1 0 8	Yes No Don't know	Go to 19 Go to 19
18.	How did you overcome that difficulty?	0 1 2 3 4 5 6 8	Still have difficulty Support from breastfeeding counsellor Support from family Support from TBA or CHW Support from medical staff (midwife, doctor, nurse) Stop breastfeeding Other, specify _____ I don't know, stopped by itself	

19	Did the way you feed NAME changed since the crisis? If NAME was born after the crisis you can compare with his/her siblings	1 0 8	Yes No Don't Know	Go to 22 Go to 22
20	Would you describe these changes as positive or negative?	1 0 8	Positive Negative Don't know	Skip 21
21	Tell me more about these changes Do not prompt and Circle all answer mentioned	1 2 3 4 5 6 7 8	Quantity eaten (voluntary cut/ increase) Appetite of the child (involuntary) Type of food eaten (diversity) Meal frequency (voluntary) Breastfeeding difficulties Breastfeeding habits Other, specify _____ Don't know	
22	Before or during your pregnancy, did you ever attend nutrition education group session on IYCF and other topic given by Plan or KBC?	1 0 8	Yes No Don't know	Go to 27 Go to 27
23	Did the participation to the session change your habits regarding the way you are feeding NAME?	1 0 8	Yes No Don't know	Go to 25 Go to 25
24	How did that change? Do not prompt and Circle all answer mentioned	1 2 3 4 5 6 7 8	Colostrum given Exclusive breastfeeding extended Continued breastfeeding extended Less breastfeeding difficulties Better knowledge on complementary feeding, meal content improved Meal frequency improved Other, specify: _____ Don't know	
25	Did it changed your habits at home regarding the quality/quantity you ate or your workload?	1 2 3 0 8	Yes, I ate better and worked less I ate better but work as much as before I ate the same but worked less No Don't know	

26	Why?	1 2 3 4 5 6 7 8	I learned knew/good things I cannot afford to follow things I learned I should follow my tradition/what my mother did I did not believe it is better than my tradition I did not understand the sessions I forgot about what was said in the session Other, specify: _____ Don't know	
	Now I would like to ask you some questions on infant and young child feeding. I would like you to tell me what you know about it even if this is different from what you do at home.			
27	Could you tell me, after delivery, when do you need to start breastfeeding your baby?	1 0	Right after /within 1 hour after birth Other answer/Don't know	
28	How long should the baby receive only breastmilk (do not even receive water)?	1 0	Until 6 months Other answer/Don't know	
29	From what age should the baby start eating food?	1 0	6 months of age Other answer/Don't know	
30	How long should the baby continue to receive breastmilk?	1 0	Until 24 months or more Less than 24 months/Don't know	

SECTION 3: ANTENATAL AND POSTNATAL CARE HISTORY

	Questions	Code	Answer	Action
31	How many ANC visits did you have during your last pregnancy? National guideline : An ANC visit is performed by midwife/lady health visitor/health assistant and include: micronutrient supplementation, vaccination, health education, child positioning, blood tests for disease check, blood pressure In camps or surroundings: ANC performed by health worker, trained AMW. Do not count a visit that was only for a pregnancy test or the Special Supplemental Nutrition Program for Women, Infants, and Children	0 1 2 3 4 8	No visit One visit Two visits Three visits Four visits or more Don't know	Go to 37
	For the following questions, please ask for the vaccination card of the mother and answer accordingly. If there is not vaccination card available, ask the question directly to the mother			
32	During your pregnancy did you receive any shots to protect you from tetanus?	1 0 8	Yes No Don't know	
33	During your pregnancy, did you receive vitamin A caps that look like this? Show a sample of the vitamin A cap	1 0 8	Yes No Don't know	

34	During your pregnancy, did you receive any iron/folic acid tablet that look like this? Show a sample of iron/folic acid tablet	1 0 8	Yes No Don't know	
35	During your pregnancy, did you receive any vitamin B1 tablet that look like this? Show a sample vitamin B1 tablets	1 0 8	Yes No Don't know	
36	During your pregnancy, did you receive any deworming tablets that look like this? Show a sample of Mebendazole tablet	1 0 8	Yes No Don't know	
37	Where did you give birth to NAME?	1 2 3 4 5	Hospital Other health facility(outside) Camp Clinic (inside) Home Other, specify_____	
38	Who assisted you during the delivery? If several persons assisted you during delivery, name the more qualified person	0 1 2 3 4 5 6 8	Nobody Doctor Nurse Midwife Traditional birth attendant Family member Other, specify_____ Don't know	
39	How long after the delivery an auxiliary midwife or more qualified health practitioner checked on your health and the health of NAME? It can be the health practitioner who visited you at home or you who came to the facility.	1 2 0 8	Less than 48 hours after delivery 48 hours or more No postnatal care visit Don't know	

Check to see if there is another child less than 24 months of age living in the household by asking: **Is there another child living in this house who is less than 24 months old?** This includes other children from the same mother as well as children from other caregivers in the same household. If same caregiver, repeat section 1 to 3 of the interview using a separate form. If another caregiver, complete a new questionnaire.

Annexe 5: Standardization test summary results

PASS STANDARDIZATION TEST (accuracy OK, precision OK) SUMMARY			
Name	Weight	Height	MUAC
1 Naw Aung		x	x
2 Lamai Bawk Nan	x		
3 Lawt Aung	x		
4 Seng lawt Maran	x	x	
5 Ja mun mai	x		
6 Naw Htoi	x		
7 Sut Seng Du	x	x	
8 Myu Tsaw	x		
9 Nu Ja	x		
10 Ting Bawm		x	x
11 Roi Bu	x		
12 La Mai	x	x	x
13 Daw Yun	x	x	x
14 Seng Jum	x	x	
15 San Ra	x	x	
16 Maran Brang Seng	x	x	x
17 Ah Phu	x		
18 May Phyo	x		x
19 Maran Ja Muy Pan	x	x	x

Annexe 6: NCHS growth reference (1977) results

Table 3.2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and sex

	All n = 217	Boys n = 108	Girls n = 109
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(5) 2,3 % (1,0 - 5,3 95% C.I.)	(4) 3,7 % (1,4 - 9,1 95% C.I.)	(1) 0,9 % (0,2 - 5,0 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(4) 1,8 % (0,7 - 4,6 95% C.I.)	(3) 2,8 % (0,9 - 7,9 95% C.I.)	(1) 0,9 % (0,2 - 5,0 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(1) 0,5 % (0,1 - 2,6 95% C.I.)	(1) 0,9 % (0,2 - 5,1 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)

The prevalence of oedema is 0,0 %

Table 3.3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (>= -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	39	0	0,0	0	0,0	39	100,0	0	0,0
18-29	55	1	1,8	1	1,8	53	96,4	0	0,0
30-41	59	0	0,0	2	3,4	57	96,6	0	0,0
42-53	47	0	0,0	1	2,1	46	97,9	0	0,0
54-59	17	0	0,0	0	0,0	17	100,0	0	0,0
Total	217	1	0,5	4	1,8	212	97,7	0	0,0

Table 3.4: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0,0 %)	Kwashiorkor No. 0 (0,0 %)
Oedema absent	Marasmic No. 1 (0,5 %)	Not severely malnourished No. 216 (99,5 %)

Table 3.5: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 220	Boys n = 109	Girls n = 111
Prevalence of global malnutrition (< 125 mm and/or oedema)	(0) 0,0 % (0,0 - 1,7 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)	(0) 0,0 % (0,0 - 3,3 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(0) 0,0 % (0,0 - 1,7 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)	(0) 0,0 % (0,0 - 3,3 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(0) 0,0 % (0,0 - 1,7 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)	(0) 0,0 % (0,0 - 3,3 95% C.I.)

Table 3.6: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (>= 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	39	0	0,0	0	0,0	39	100,0	0	0,0
18-29	57	0	0,0	0	0,0	57	100,0	0	0,0
30-41	59	0	0,0	0	0,0	59	100,0	0	0,0
42-53	48	0	0,0	0	0,0	48	100,0	0	0,0
54-59	17	0	0,0	0	0,0	17	100,0	0	0,0
Total	220	0	0,0	0	0,0	220	100,0	0	0,0

Table 3.5: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

	n = 217
Prevalence of global acute malnutrition (<80% and/or oedema)	(2) 0,9 % (0,3 - 3,3 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(2) 0,9 % (0,3 - 3,3 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0,0 % (0,0 - 1,7 95% C.I.)

Table 3.6: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema

Age (mo)	Total no.	Severe wasting (<70% median)		Moderate wasting (>=70% and <80% median)		Normal (>=80% median)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	39	0	0,0	0	0,0	39	100,0	0	0,0
18-29	55	0	0,0	1	1,8	54	98,2	0	0,0
30-41	59	0	0,0	1	1,7	58	98,3	0	0,0
42-53	47	0	0,0	0	0,0	47	100,0	0	0,0
54-59	17	0	0,0	0	0,0	17	100,0	0	0,0
Total	217	0	0,0	2	0,9	215	99,1	0	0,0

Table 3.7: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 218	Boys n = 108	Girls n = 110
Prevalence of underweight (<-2 z-score)	(49) 22,5 % (17,4 - 28,5 95% C.I.)	(26) 24,1 % (17,0 - 32,9 95% C.I.)	(23) 20,9 % (14,4 - 29,4 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(47) 21,6 % (16,6 - 27,5 95% C.I.)	(26) 24,1 % (17,0 - 32,9 95% C.I.)	(21) 19,1 % (12,8 - 27,4 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(2) 0,9 % (0,3 - 3,3 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)	(2) 1,8 % (0,5 - 6,4 95% C.I.)

Table 3.8: 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.	%
6-17	39	0	0,0	5	12,8	34	87,2	0	0,0
18-29	55	0	0,0	12	21,8	43	78,2	0	0,0
30-41	59	0	0,0	14	23,7	45	76,3	0	0,0
42-53	48	1	2,1	12	25,0	35	72,9	0	0,0
54-59	17	1	5,9	4	23,5	12	70,6	0	0,0
Total	218	2	0,9	47	21,6	169	77,5	0	0,0

Table 3.9: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 220	Boys n = 109	Girls n = 111
Prevalence of stunting (<-2 z-score)	(77) 35,0 % (29,0 - 41,5 95% C.I.)	(38) 34,9 % (26,6 - 44,2 95% C.I.)	(39) 35,1 % (26,9 - 44,4 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(61) 27,7 % (22,2 - 34,0 95% C.I.)	(33) 30,3 % (22,4 - 39,5 95% C.I.)	(28) 25,2 % (18,1 - 34,0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(16) 7,3 % (4,5 - 11,5 95% C.I.)	(5) 4,6 % (2,0 - 10,3 95% C.I.)	(11) 9,9 % (5,6 - 16,9 95% C.I.)

Table 3.10: 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.	%
6-17	39	1	2,6	6	15,4	32	82,1
18-29	57	4	7,0	12	21,1	41	71,9
30-41	59	2	3,4	19	32,2	38	64,4
42-53	48	6	12,5	20	41,7	22	45,8
54-59	17	3	17,6	4	23,5	10	58,8
Total	220	16	7,3	61	27,7	143	65,0

Table 3.11: Prevalence of overweight based on weight for height cut off's and by sex (no oedema)

	All n = 217	Boys n = 108	Girls n = 109
Prevalence of overweight (WHZ > 2)	(0) 0,0 % (0,0 - 1,7 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0,0 % (0,0 - 1,7 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)	(0) 0,0 % (0,0 - 3,4 95% C.I.)

Table 3.12: Prevalence of overweight by age, based on weight for height (no oedema)

Age (mo)	Total no.	Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
		No.	%	No.	%
6-17	39	0	0,0	0	0,0
18-29	55	0	0,0	0	0,0
30-41	59	0	0,0	0	0,0
42-53	47	0	0,0	0	0,0
54-59	17	0	0,0	0	0,0
Total	217	0	0,0	0	0,0

Table 3.13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores $\pm$ SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	217	-0,49 $\pm$ 0,77	1,00	17	0
Weight-for-Age	218	-1,35 $\pm$ 0,84	1,00	16	0
Height-for-Age	220	-1,59 $\pm$ 1,04	1,00	14	0

* contains for WHZ and WAZ the children with edema.

Annexe 7: Plausibility check report

Plausibility check for: MMR_201312_KACHIN_PLAN.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
Missing/Flagged data (% of in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0,5 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0,896)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0,141)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (6)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (9)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (8)
Standard Dev WHZ .	Excl	SD	<1.1 and >0.9 0	<1.15 and >0.85 2	<1.20 and >0.80 6	>=1.20 or <=0.80 20	6 (0,83)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0,04)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0,06)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	5 (p=)
Timing	Excl	Not determined yet	0	1	3	5	
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	15 %

The overall score of this survey is 15 %, this is acceptable.

There were no duplicate entries detected.

Missing data:

WEIGHT: Line=12/ID=12, Line=30/ID=30, Line=33/ID=33, Line=34/ID=34, Line=35/ID=35, Line=37/ID=37, Line=47/ID=47, Line=107/ID=107, Line=135/ID=135, Line=141/ID=5, Line=142/ID=6, Line=145/ID=9, Line=169/ID=33, Line=172/ID=36, Line=176/ID=40, Line=219/ID=4

HEIGHT: Line=12/ID=12, Line=30/ID=30, Line=33/ID=33, Line=34/ID=34, Line=35/ID=35, Line=37/ID=37, Line=47/ID=47, Line=107/ID=107, Line=135/ID=135, Line=169/ID=33, Line=172/ID=36, Line=173/ID=37, Line=176/ID=40, Line=219/ID=4

Percentage of children with no exact birthday: 0 %

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=119/ID=119: **WHZ (-3,449)**, Height may be incorrect

Percentage of values flagged with SMART flags: WHZ: 0,5 %, HAZ: 0,0 %, WAZ: 0,0 %

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: 0,75 (The value should be around 0.85).

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

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	19/27,4 (0,7)	22/26,9 (0,8)	41/54,3 (0,8)	0,86
18 to 29	12	32/26,7 (1,2)	27/26,2 (1,0)	59/52,9 (1,1)	1,19
30 to 41	12	28/25,9 (1,1)	33/25,4 (1,3)	61/51,3 (1,2)	0,85
42 to 53	12	29/25,5 (1,1)	24/25,0 (1,0)	53/50,5 (1,0)	1,21
54 to 59	6	10/12,6 (0,8)	10/12,4 (0,8)	20/25,0 (0,8)	1,00
6 to 59	54	118/117,0 (1,0)	116/117,0 (1,0)		1,02

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

Overall sex ratio: p-value = 0,896 (boys and girls equally represented)

Overall age distribution: p-value = 0,141 (as expected)

Overall age distribution for boys: p-value = 0,306 (as expected)

Overall age distribution for girls: p-value = 0,452 (as expected)

Overall sex/age distribution: p-value = 0,074 (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: **6** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0,745

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: **9** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0,047 (significant difference)

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: **8** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0,155

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:	0,86	0,86	0,83
(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:	1,06	1,06	1,06
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	44,5%	44,5%	44,5%
calculated with current SD:	41,5%	41,5%	41,5%
calculated with a SD of 1:	41,0%	41,0%	41,0%

WAZ			
Standard Deviation SD:	0,87	0,87	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= 0,446	p= 0,446	p= 0,984
HAZ	p= 0,572	p= 0,572	p= 0,572
WAZ	p= 0,847	p= 0,847	p= 0,847

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

Skewness

WHZ	-0,24	-0,24	-0,04
HAZ	0,13	0,13	0,13
WAZ	0,12	0,12	0,12

If the absolute 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	0,56	0,56	-0,06
HAZ	-0,20	-0,20	-0,20
WAZ	0,00	0,00	0,00

Kurtosis characterizes the relative size of the body versus the tails of the distribution (which sometimes manifests as excess peakedness or flatness compared with the normal distribution). Positive kurtosis indicates relatively large tails and small body (this often manifests as peaked distribution), negative kurtosis indicates relatively large body and small tales (this often manifests as flat distribution).

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.

Analysis by Team

Team	1	2	3	4	5	6
n =	41	38	51	43	42	19

Percentage of values flagged with SMART flags:

WHZ:	20,6	0,0	10,9	7,3	5,0	5,6
HAZ:	10,8	0,0	10,9	4,9	5,0	5,6
WAZ:	17,1	0,0	10,9	4,9	5,0	5,6

Age ratio of 6-29 months to 30-59 months:

	0,95	0,73	0,65	0,87	0,83	0,36
--	------	------	------	------	------	------

Sex ratio (male/female):

	0,95	0,90	1,04	1,26	1,00	0,90
--	------	------	------	------	------	------

Digit preference Weight (%):

.0 :	11	8	7	10	15	6
.1 :	9	21	4	12	5	11
.2 :	9	5	9	7	8	11
.3 :	14	13	17	12	8	6
.4 :	14	11	11	20	10	6
.5 :	14	8	4	7	15	17
.6 :	6	3	11	10	10	17
.7 :	3	11	9	15	13	11
.8 :	9	5	13	2	5	11
.9 :	11	16	15	5	13	6
DPS:	12	17	14	16	12	14

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

Digit preference Height (%):

.0 :	16	8	4	7	5	6
.1 :	11	11	17	7	18	11
.2 :	5	16	15	7	8	11
.3 :	16	18	4	17	13	17
.4 :	8	3	17	22	20	17
.5 :	8	8	7	2	8	17
.6 :	11	11	11	15	8	6
.7 :	0	11	13	7	10	11
.8 :	16	8	4	10	10	6
.9 :	8	8	7	5	3	0
DPS:	17	14	17	19	17	18

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

Digit preference MUAC (%):

.0 :	5	0	4	5	8	11
.1 :	5	13	15	10	8	0
.2 :	5	13	7	7	5	11
.3 :	14	8	9	10	5	6
.4 :	5	11	15	20	10	6
.5 :	14	8	11	0	15	6
.6 :	8	16	15	17	13	17
.7 :	24	13	9	5	5	22
.8 :	8	11	7	15	20	11
.9 :	11	8	9	12	13	11
DPS:	19	14	13	19	16	20

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

Standard deviation of WHZ:

SD 0,59 0,97 0,90 0,90 0,71 1,02

Prevalence (< -2) observed:

% 5,6

Prevalence (< -2) calculated with current SD:

% 4,0

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

% 3,7

Standard deviation of HAZ:

SD 1,02 0,95 1,02 1,11 1,18 0,95

observed:

% 56,8 43,5 24,4 57,5

calculated with current SD:

% 50,8 41,5 30,3 44,2

calculated with a SD of 1:

% 50,8 41,4 28,4 43,1

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	6/4,6 (1,3)	4/4,9 (0,8)	10/9,5 (1,1)	1,50
18 to 29	12	3/4,5 (0,7)	7/4,8 (1,5)	10/9,3 (1,1)	0,43
30 to 41	12	4/4,4 (0,9)	5/4,6 (1,1)	9/9,0 (1,0)	0,80
42 to 53	12	6/4,3 (1,4)	5/4,5 (1,1)	11/8,8 (1,2)	1,20
54 to 59	6	1/2,1 (0,5)	0/2,2 (0,0)	1/4,4 (0,2)	
6 to 59	54	20/20,5 (1,0)	21/20,5 (1,0)		0,95

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

Overall sex ratio: p-value = 0,876 (boys and girls equally represented)

Overall age distribution: p-value = 0,523 (as expected)

Overall age distribution for boys: p-value = 0,698 (as expected)

Overall age distribution for girls: p-value = 0,471 (as expected)

Overall sex/age distribution: p-value = 0,214 (as expected)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	5/4,2 (1,2)	5/4,6 (1,1)	10/8,8 (1,1)	1,00
18 to 29	12	4/4,1 (1,0)	2/4,5 (0,4)	6/8,6 (0,7)	2,00
30 to 41	12	6/3,9 (1,5)	6/4,4 (1,4)	12/8,3 (1,4)	1,00
42 to 53	12	0/3,9 (0,0)	5/4,3 (1,2)	5/8,2 (0,6)	0,00
54 to 59	6	3/1,9 (1,6)	2/2,1 (0,9)	5/4,1 (1,2)	1,50
6 to 59	54	18/19,0 (0,9)	20/19,0 (1,1)		0,90

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

Overall sex ratio: p-value = 0,746 (boys and girls equally represented)

Overall age distribution: p-value = 0,402 (as expected)

Overall age distribution for boys: p-value = 0,221 (as expected)

Overall age distribution for girls: p-value = 0,709 (as expected)

Overall sex/age distribution: p-value = 0,100 (as expected)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	0/6,0 (0,0)	5/5,8 (0,9)	5/11,8 (0,4)	0,00
18 to 29	12	8/5,9 (1,4)	7/5,7 (1,2)	15/11,5 (1,3)	1,14
30 to 41	12	4/5,7 (0,7)	6/5,5 (1,1)	10/11,2 (0,9)	0,67
42 to 53	12	11/5,6 (2,0)	4/5,4 (0,7)	15/11,0 (1,4)	2,75
54 to 59	6	3/2,8 (1,1)	3/2,7 (1,1)	6/5,4 (1,1)	1,00
6 to 59	54	26/25,5 (1,0)	25/25,5 (1,0)		1,04

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

Overall sex ratio: p-value = 0,889 (boys and girls equally represented)

Overall age distribution: p-value = 0,158 (as expected)

Overall age distribution for boys: p-value = 0,014 (significant difference)

Overall age distribution for girls: p-value = 0,927 (as expected)

Overall sex/age distribution: p-value = 0,009 (significant difference)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	3/5,6 (0,5)	3/4,4 (0,7)	6/10,0 (0,6)	1,00
18 to 29	12	9/5,4 (1,7)	5/4,3 (1,2)	14/9,7 (1,4)	1,80
30 to 41	12	3/5,3 (0,6)	6/4,2 (1,4)	9/9,4 (1,0)	0,50
42 to 53	12	7/5,2 (1,4)	4/4,1 (1,0)	11/9,3 (1,2)	1,75
54 to 59	6	2/2,6 (0,8)	1/2,0 (0,5)	3/4,6 (0,7)	2,00
6 to 59	54	24/21,5 (1,1)	19/21,5 (0,9)		1,26

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

Overall sex ratio: p-value = 0,446 (boys and girls equally represented)

Overall age distribution: p-value = 0,361 (as expected)

Overall age distribution for boys: p-value = 0,261 (as expected)

Overall age distribution for girls: p-value = 0,755 (as expected)

Overall sex/age distribution: p-value = 0,087 (as expected)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	4/4,9 (0,8)	5/4,9 (1,0)	9/9,7 (0,9)	0,80
18 to 29	12	7/4,8 (1,5)	3/4,8 (0,6)	10/9,5 (1,1)	2,33
30 to 41	12	7/4,6 (1,5)	6/4,6 (1,3)	13/9,2 (1,4)	1,17
42 to 53	12	2/4,5 (0,4)	4/4,5 (0,9)	6/9,1 (0,7)	0,50
54 to 59	6	1/2,2 (0,4)	3/2,2 (1,3)	4/4,5 (0,9)	0,33
6 to 59	54	21/21,0 (1,0)	21/21,0 (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 = 0,604 (as expected)

Overall age distribution for boys: p-value = 0,334 (as expected)

Overall age distribution for girls: p-value = 0,846 (as expected)

Overall sex/age distribution: p-value = 0,202 (as expected)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	1/2,1 (0,5)	0/2,3 (0,0)	1/4,4 (0,2)	
18 to 29	12	1/2,0 (0,5)	3/2,3 (1,3)	4/4,3 (0,9)	0,33
30 to 41	12	4/2,0 (2,0)	4/2,2 (1,8)	8/4,2 (1,9)	1,00
42 to 53	12	3/1,9 (1,5)	2/2,2 (0,9)	5/4,1 (1,2)	1,50
54 to 59	6	0/1,0 (0,0)	1/1,1 (0,9)	1/2,0 (0,5)	0,00
6 to 59	54	9/9,5 (0,9)	10/9,5 (1,1)		0,90

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

Overall sex ratio: p-value = 0,819 (boys and girls equally represented)

Overall age distribution: p-value = 0,141 (as expected)

Overall age distribution for boys: p-value = 0,318 (as expected)

Overall age distribution for girls: p-value = 0,397 (as expected)

Overall sex/age distribution: p-value = 0,066 (as expected)