

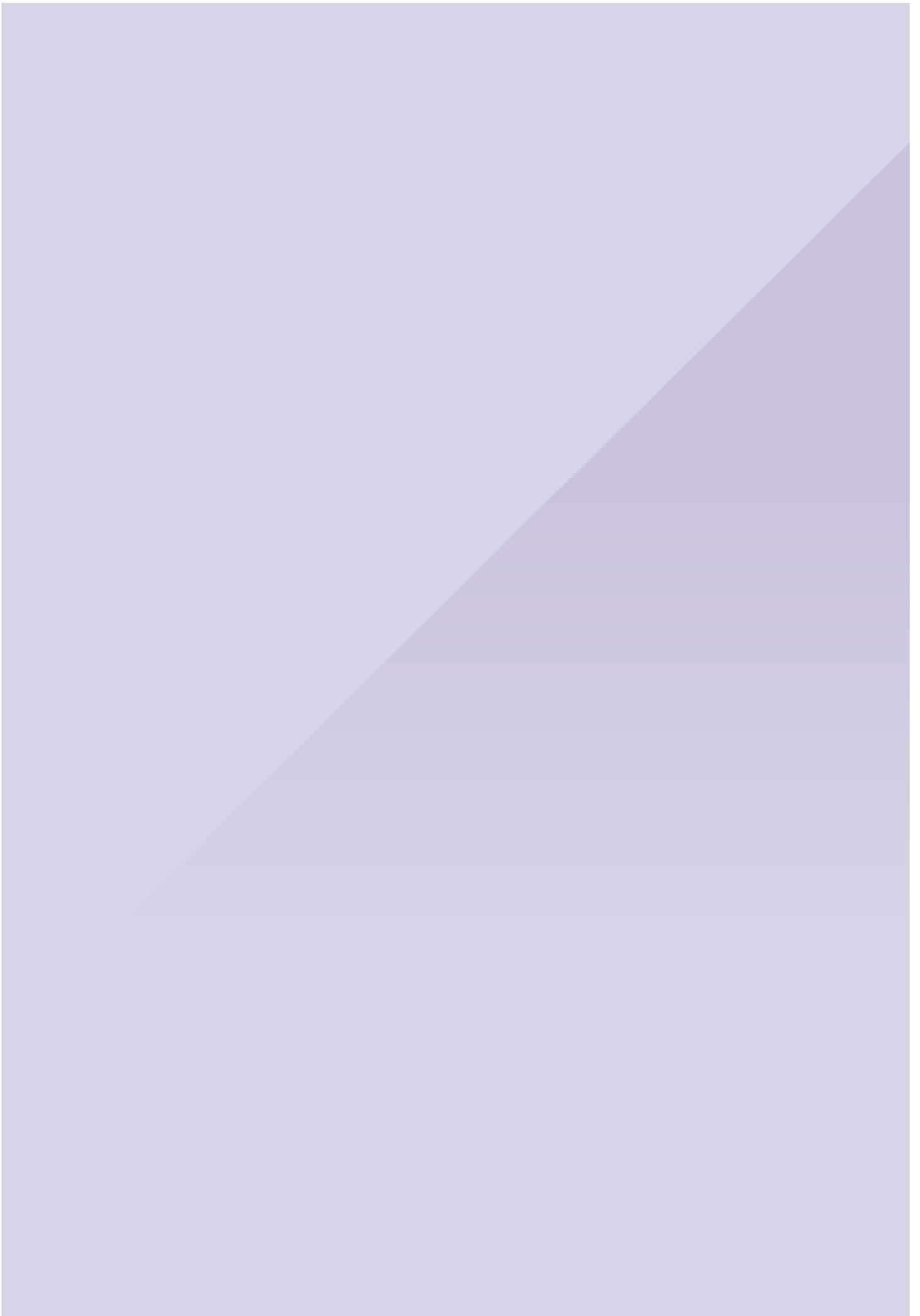
UNHCR  
STANDARDISED EXPANDED  
NUTRITION SURVEY (SENS) GUIDELINES  
FOR REFUGEE POPULATIONS

MODULE 2:  
**ANTHROPOMETRY AND HEALTH**

A PRACTICAL STEP-BY-STEP GUIDE

VERSION 3 (2018)





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# Table of Contents

<b>KEY MESSAGES</b> .....	4
<b>DEFINITION OF SOME KEY TERMS</b> .....	5
<b>OBJECTIVES AND TARGET GROUPS</b> .....	7
<b>DATA COLLECTION</b> .....	10
MEASUREMENT METHODS .....	10
MATERIAL NEEDED .....	13
CASE DEFINITIONS AND CALCULATIONS .....	15
ETHICAL CONSIDERATIONS .....	18
STANDARD PROCEDURE AND QUALITY ASSURANCE .....	19
<b>TRAINING</b> .....	20
COMMON ERRORS AND CHALLENGES IN TRAINING AND DATA COLLECTION .....	21
<b>QUESTIONNAIRE AND INSTRUCTIONS</b> .....	24
<b>SETTING-UP ENA FOR SMART SOFTWARE FOR SENS</b> .....	34
<b>DATA REVIEW</b> .....	35
DAILY QUESTIONNAIRE CHECK AND OVERSEEING INTERVIEWS .....	35
DATABASE CHECK .....	35
SMART PLAUSIBILITY CHECK ON ANTHROPOMETRIC DATA .....	38
DAILY SMART PLAUSIBILITY CHECK .....	39
END OF SURVEY SMART PLAUSIBILITY CHECK .....	40
<b>PRESENTATION OF RESULTS</b> .....	41
RESULT TABLES AND FIGURES .....	42
<b>DATA ANALYSIS</b> .....	63
ANALYSIS PROCEDURES .....	63
COMMON ERRORS AND CHALLENGES IN DATA ANALYSIS .....	65

<b>USE OF RESULTS</b> .....	66
CLASSIFICATION OF PUBLIC HEALTH PROBLEM AND TARGETS .....	66
RECOMMENDATIONS .....	68
<b>SMART INITIATIVE DOCUMENTATION REFERENCES</b> .....	69
SMART SURVEY PLANNING TOOLS .....	69
SMART METHODOLOGY RESOURCES .....	72
ANNEX 1- EVENTS CALENDAR .....	74
ANNEX 2- ORDERING INFORMATION .....	76
ANNEX 3- SENS CHILDREN 6-59 QUESTIONNAIRE .....	77
ANNEX 4- WOMAN SENS QUESTIONNAIRE .....	82
ANNEX 5- REFERRAL FORM .....	85
ANNEX 6- ANTHROPOMETRY QUALITY ASSURANCE LOGSHEET .....	86
ANNEX 7- PICTURES OF ANTHROPOMETRIC MEASUREMENTS .....	88
ANNEX 8- PLAUSIBILITY CHECKS ON ANTHROPOMETRIC DATA .....	90
ANNEX 9- EPI INFO ANALYSIS .....	102
ANNEX 10- WAST (WASTING AND STUNTING) ANALYSIS .....	129

## Key messages

- Data on the prevalence of acute malnutrition (based on weight-for-height and / or oedema) and stunting (based on height-for-age) among children aged 6-59 months is essential to collect in refugee settings for monitoring purposes. When justified, other age groups are sometimes also included.
- Data on the coverage of measles vaccination, the coverage of vitamin A supplementation in the last six months and the two-week period prevalence of diarrhoea in young children is essential to collect in refugee settings for monitoring purposes.
- Data on the enrolment in nutrition programmes (targeted supplementary (TSFP), therapeutic (OTP/SC) and/or blanket (BSFP) where they exist) are recommended to be collected in SENS surveys conducted in refugee contexts.
- When justified, additional objectives on the coverage of deworming in the last six months and use of oral rehydration salts (ORS) and zinc during diarrhoea episodes in young children, and on the prevalence of MUAC malnutrition in women (non-pregnant, non-lactating and/or pregnant and lactating) can be collected.
- A standard questionnaire should be used for the collection of the SENS indicators.
- Providing good quality training to survey teams, supervising them well and checking the quality of the data they are collecting on a daily basis will help ensure that data are reliable.
- Standard methods have been developed for collecting, analysing and presenting anthropometric data in reports (**refer to SMART initiative documentation**). Standardising this process helps to maintain the quality, reliability and usability of SENS survey data.
- The prevalence of stunting (height-for-age) and underweight (weight-for-age) should be presented as part of the survey report but should be interpreted with caution where reliable age data is not available (as is the case in many refugee situations).
- There are standard ways of reporting anthropometric, measles vaccination, vitamin A supplementation, diarrhoea, nutrition programme enrolment and deworming results that should be followed in all SENS survey reports produced in refugee contexts.

## Definition of some key terms

**Acute malnutrition:** acute malnutrition is a form of undernutrition. It is caused by a decrease in food consumption and / or illness resulting in bilateral pitting oedema or sudden weight loss. It is defined by the presence of bilateral pitting oedema or wasting (low MUAC or low weight-for-height z-score).

**Anthropometry:** anthropometry is the study and technique of human body measurement. It is used to measure and monitor the nutritional status of an individual or population group.

**Bilateral Pitting Oedema:** bilateral pitting oedema, also known as nutritional oedema, kwashiorkor or oedematous malnutrition, is a sign of severe acute malnutrition (SAM). It is defined by bilateral pitting oedema of the feet and verified when thumb pressure applied on top of both feet for three seconds leaves a pit (indentation) in both feet after the thumb is lifted. It is an abnormal infiltration and excess accumulation of serous fluid in connective tissue or in a serous cavity.

**Blanket Supplementary Feeding (BSFP):** it is a type of selective feeding programme. The primary objective of BSFPs is to prevent deterioration and to protect nutritional status and related morbidity and mortality in members of at risk groups (for example children 6-23 months, 6-35 months, 6-59 months, pregnant and lactating women). Various products can be used including fortified blended foods (e.g. SuperCereal Plus), ready-to-use supplementary food (RUSF) or special nutritional products (e.g. Small or medium quantity lipid-based nutrient supplement).

**Community Management of Acute Malnutrition (CMAM):** CMAM includes community outreach for community involvement and early detection and referral of cases of acute malnutrition, and follow up of problem cases in their homes, management of severe acute malnutrition (SAM) in outpatient care for children 6-59 months with SAM without medical complications (component referred to often as Outpatient Therapeutic Programme (OTP)), the management of SAM in inpatient care for children 6-59 months with SAM and medical complications (with no appetite) and children under 6 months with acute malnutrition (component referred to often as Stabilisation Centre (SC)), and the management of moderate acute malnutrition (MAM) for children 6-59 months (component referred to often as Targeted Supplementary Feeding Programme (TSFP)). CMAM is also known as Integrated Management of Acute Malnutrition (IMAM).

**Diarrhoea:** diarrhoea is defined as having 3 or more loose or watery stools per day. The loss of fluids through diarrhoea can cause dehydration and electrolyte imbalance.

**Global Acute Malnutrition (GAM):** GAM is a population-level indicator referring to overall acute malnutrition defined by the presence of bilateral pitting oedema and / or wasting defined by weight-for-height z-score (WHZ) below two standard deviations of the median reference population. GAM is divided into moderate and severe acute malnutrition (GAM=MAM + SAM).

**Helminths:** a group of parasites commonly referred to as worms. The group includes the trematodes (flukes), cestodes (tapeworms) and nematodes (roundworms). The helminth species that is covered in this SENS manual are soil-transmitted helminths (nematodes). Four species of nematodes are collectively referred to as 'soil-transmitted helminths': the roundworm, *Ascaris lumbricoides*; the whipworm, *Trichuris trichiura*; and the hookworms *Necator americanus* and *Ancylostoma duodenale*.

**Kwashiorkor:** a form of severe undernutrition referred to alternatively as oedematous malnutrition. Symptoms may include oedema; thin, sparse or discoloured hair; and skin with discoloured patches that may crack and peel. See Bilateral Pitting Oedema.

**Measles:** an acute, contagious viral disease, usually occurring in childhood and characterised by eruption of red spots on the skin, fever and catarrhal symptoms.

**Reference Population:** the WHO Growth Standards (2006) reference values are based on large surveys of healthy children, whose measurements represent an international reference for deriving an individual's anthropometric status.

**Severe Acute Malnutrition (SAM):** SAM is defined by the presence of bilateral pitting oedema or severe wasting (MUAC < 115 mm or a WHZ < -3 z-score). A child with SAM is highly vulnerable and has a high mortality risk. SAM can also be used as a population-based indicator defined by the presence of bilateral pitting oedema or severe wasting (WHZ < -3 z-score).

**Stunting (chronic malnutrition):** stunting, or chronic malnutrition, is a form of undernutrition. It is defined by a height-for-age z-score (HAZ) below two standard deviations of the median reference population. Stunting is a result of prolonged or repeated episodes of undernutrition often starting before birth. This type of undernutrition is best addressed through preventive maternal health programmes aimed at pregnant women, infants, and children under age 2. Programme responses to stunting require longer-term planning and policy development.

**Supplementary feeding:** also known as 'targeted supplementary feeding' or TSFP, it involves the provision of an additional food ration for moderately malnourished children (or adults).

**Therapeutic feeding:** provision of medical and dietary treatment to children with SAM, which includes Outpatient Therapeutic Programme (OTP) and Stabilisation Centre (SC).

**Vitamin A:** a fat-soluble vitamin important for normal vision, tissue growth, and healthy skin. It is found in fish-liver oils, milk, green leafy vegetables, and red, orange, and yellow vegetables and fruits. A deficiency of vitamin A in humans causes poor vision at night and damage to the skin and mucous membranes.

**Wasting:** wasting is a form of acute malnutrition. It is defined by MUAC < 125 mm or a WHZ < -2 z-score.

**Z-score:** a score that indicates how far a measurement is from the median – also known as standard deviation (SD) score. The reference lines on the growth charts (labelled 1, 2, 3, -1, -2, -3) are called z-score lines; they indicate how far points are above or below the median (z-score 0).

## Objectives and target groups

- The standard target group to routinely include in an anthropometric assessment in refugee contexts is children aged 6-59 months. When justified, other age groups are sometimes also included.
- Children aged 9-59 months will be assessed for measles vaccination (or other context-specific target group e.g. 9-23 months).
- Children aged 6-59 months will be assessed for vitamin A supplementation in the last six months, diarrhoea in the last two weeks and current enrolment into the targeted supplementary and therapeutic (OTP/SC) nutrition programmes.
- If there is a BSFP in place, BSFP coverage should be assessed in the context-specific target age group (i.e. 6-23 months, 6-35 months or 6-59 months, pregnant women and/or lactating women with an infant under 6 months).

Optional SENS indicators, where applicable:

- If the use of ORS and/or zinc tablets or syrup during diarrhoea episodes is assessed (optional SENS indicators), ensure to use the local terms known for the various products found at health centres or local pharmacies, especially for the zinc supplements that can easily be confused with certain other medications.
- If deworming coverage in the last six months is measured (optional SENS indicator), ensure to include children in the context-specific target age group (e.g. 12-59 months, 24-59 months). The dosage of the deworming tablet (i.e. mebendazole and albendazole) is usually different for 1-2 years old and above 2 years old children.
- If MUAC is measured in women (optional SENS indicator), include women aged 15-49 years and ensure to adjust the cut-off values and categories to the context. Ensure to measure MUAC according to the physiological status of the women that make sense for the context and the programmes planned or in place, i.e. non-pregnant, non-lactating women and/or pregnant and lactating women.

*Objectives should be worded as follows in the survey protocol and report:*

**Primary objectives:**

1. To measure the prevalence of acute malnutrition in children aged 6-59 months.
2. To measure the prevalence of stunting in children aged 6-59 months.
3. To determine the coverage of measles vaccination among children aged 9-59 months (or context-specific target group e.g. 9-23 months).
4. To determine the coverage of vitamin A supplementation in the last six months among children aged 6-59 months.
5. To determine the two-week period prevalence of diarrhoea among children aged 6-59 months.

**Secondary objectives:**

1. To determine the enrolment into the targeted supplementary (TSFP) and therapeutic (OTP/SC) nutrition programmes for children aged 6-59 months.
2. To determine the coverage of the blanket supplementary feeding programme (BSFP) for children aged 6-23/6-35/6-59 months. (**SENS recommendation:** include this indicator in all contexts where a BSFP is in place for young children).
3. To determine the coverage of deworming (soil-transmitted helminth control) with mebendazole or albendazole in the last six months among young children (include context specific target age group, 12-59m/24-59m). (**SENS recommendation:** include this indicator only if a deworming campaign was done in the last six months in pre-school children at the same time as a vaccination campaign and/or a vitamin A campaign using drugs for intestinal worms, namely mebendazole or albendazole, and if results are needed for programme monitoring purposes).
4. To determine the coverage of the blanket supplementary feeding programme (BSFP) for pregnant women and lactating women with an infant less than 6 months aged 15-49 years. (**SENS recommendation:** include this indicator in all contexts where a BSFP is in place for pregnant and lactating women with an infant less than 6 months).

**Optional objectives:**

1. To determine the use of ORS and/or zinc tablets or syrup during diarrhoea episodes in children aged 6-59 months. (**SENS recommendation:** include these indicators especially in areas where diarrhoea is common and there is a need to know the practices during diarrhoea episodes).
2. To determine the prevalence of MUAC malnutrition in women of reproductive age 15-49 years (include if all, pregnant and/or lactating women are measured). (**SENS recommendation:** include this indicator only if results are needed for a baseline assessment or for programme monitoring purposes. MUAC in women is usually needed in contexts where there is a BSFP in place for women; usually such programmes are for pregnant and lactating women with an infant less than 6 months).
3. To determine the time of arrival of the children in the camp /asylum country (**SENS recommendations:** only include this indicator if the survey is being carried out in settings with recent/new influxes of refugees and there is a suspicion of different nutritional status among these new refugees. UNHCR HQ / Regional Offices should be contacted to determine if this optional indicator should be included or not and for assistance in analysing this data).

**Things to note:**

- There will be targeted supplementary (TSFP) and therapeutic (OTP/SC) nutrition programmes in most refugee settings to treat acutely malnourished children. A SENS survey is a good opportunity to ask about enrolment of the surveyed children into the nutrition programmes running in the area for the treatment of acute malnutrition. This will only provide a rough estimation of the coverage of such programmes but may point out to some major problems that can be addressed following the survey. However *coverage surveys* as opposed to SENS surveys are the best way to determine the coverage of these types of nutrition programmes due to the small sample size of acutely malnourished children found during nutrition surveys. This is why this objective should always be worded as a secondary objective.
- The systematic inclusion of infants aged 0-5 months in SENS survey is not currently recommended by UNHCR for the following main reasons: (1) The accurate weight measurement of infants 0-5 months requires an infant scale with a higher precision (+/-10g) than those most commonly used during nutrition surveys (+/- 100g); (2) If a meaningful, precise estimate of infant malnutrition is needed for programmatic purposes, sample size requirements can be difficult to meet; (3) Interpretation of malnutrition results among children aged 6-59 months and 0-59 months are often wrongly used interchangeably and compared; and (4) Reporting malnutrition results among children aged 6-59 months is currently the norm in refugee settings and emergencies. However, in certain circumstances, where there may be particular concerns over the nutritional status of infants 0-5 months old, these infants may also be included in the anthropometric assessment if proper scales are used, specialised training is provided for measuring infants' length (e.g. a cloth needs to be used below the knees of infants during length measurement) and sample size requirements are met. MUAC in infants 0-5 months is increasingly being measured and may be a more feasible option to include in a SENS survey.

# Data collection

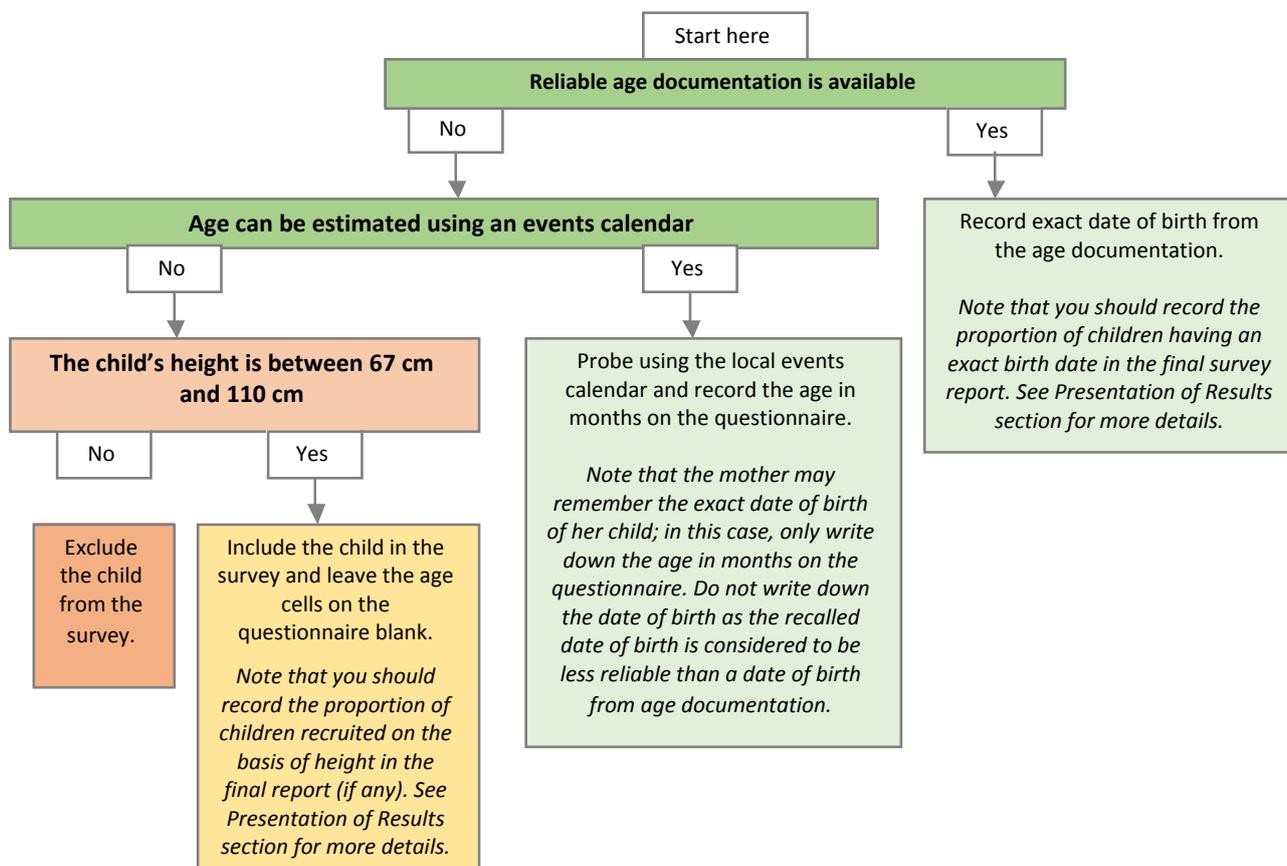
## Measurement methods

**Sex:** gender is recorded as male or female.

**Birth date or age in months:** the exact date of birth (day, month, year) is recorded from either an EPI card, child health card or birth notification if available. Note that the ‘UNHCR Manifest’ should never be used for recording the age of a child. If no reliable proof of age is available, age is estimated in months using a local events calendar or by comparing the selected child with a sibling or the child of a neighbour whose ages are known, and is recorded in months on the questionnaire. If the child’s age can absolutely not be determined by using a local events calendar or by probing, the child’s height can be used for inclusion; the child must measure between 67 cm and 110 cm (note that no stunting and underweight data will be calculated for these children recruited on the basis of height only and with no age data). In the final report, the proportion of children with age documentation should be recorded. For an example of a local events calendar to use and adapt to the refugee setting being surveyed, see **Annex 1** or see SENS Anthropometry and Health Module tool: [**Tool 1**-Local Events Calendar].



**FIGURE 1** FLOW CHART FOR COLLECTING AGE DATA DURING A SURVEY.



**Weight:** children are weighed without clothes using an electronic scale. Measurements are taken to the closest 100 grams. The use of the electronic scale is highly recommended as opposed to the use of the Salter scale to increase quality of weight data. **Leaving very light underwear on is acceptable if it is not possible to remove all clothing.**

- **Weighing with clothes:** There may be contexts where removal of clothes is not acceptable at all. If the clothes worn are fairly standard, e.g. a simple pair of trousers with a shirt, then a sample of the common items can be weighed, and that weight subtracted from the weight of each child wearing similar clothes. There is an optional variable that can be added to the SENS questionnaire to assess whether children were measured with or without clothes. **This optional variable should only be added in contexts where the majority of the survey population refuses to remove clothes from children during weighing.** For more details on how to adjust for weight of clothes, refer to SENS Anthropometry and Health tool: [Tool 2- Setting-up ENA Software for SENS] (note that ENA for SMART software can do this subtraction automatically).



**Height/Length:** children's height or length is taken to the closest millimetre using a wooden height board. **Whether the child is measured lying down or standing up is recorded on the SENS questionnaire (as is recommended by the SMART Initiative).** It is preferable to use boards with two tape measures attached, one on each side, marked out in 0.1cm increments. The board should be easily set upright to measure height with the head piece of the length board becoming the base when the board is set upright. Age or height can be used to decide on whether a child should be measured lying down (length) or standing up (height). It must be ensured that all teams in the same survey use the same criteria and that the same criterion is used from year to year in the same refugee settings. Below are the recommendations to follow:

- In a context where official age documentation is available for most children, age should be used to decide how to measure a child. Children less than 24 months should be measured lying down while those 24 months or older should be measured standing up.
- In a context where age of children is mainly estimated from a local events calendar or by recall, height should be used to find out how to measure a child. Children less than 87cm are measured lying down, while those greater than or equal to 87cm are measured standing up. A screening stick labelled at 87cm may be used for helping to decide on the measurement method.

**Oedema:** bilateral oedema, also known as nutritional oedema, is assessed by applying gentle thumb pressure onto the tops of both feet of the child for a period of three seconds and thereafter observing for the presence or absence of an indent. All oedema cases reported by the survey teams should be verified by the survey manager and need immediate referral (see Ethical Considerations section below).

**MUAC (children):** MUAC is measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the closest millimetre or centimetre using a standard tape.

**Child enrolment in targeted supplementary (TSFP), therapeutic (OTP/SC) or blanket feeding (BSFP) programmes:** if there are nutrition programmes in place for acutely malnourished children, enrolment of children should be assessed for the targeted supplementary (TSFP) and therapeutic feeding programmes (OTP/SC) running in the survey area. If there is a blanket supplementary feeding programme (BSFP), coverage of children should be assessed.

**Measles vaccination:** measles vaccination is assessed by checking for the measles vaccine on the Expanded Programme on Immunization (EPI) card if available or by asking the caregiver to recall if no EPI card is available. The location on the body where measles vaccination is usually given in the refugee context or in the place of origin of the refugees should be investigated. This may help the caregiver to recall which vaccine the child has received. In paper-based surveys, measles vaccination is assessed for all children aged 6-59 months to make data collection easier, however analysis is only done on the target age group (9-59 months or other context-specific target group).

**Vitamin A supplementation in the last 6 months:** whether the child received a high-dose vitamin A capsule over the past six months is recorded from the EPI card or health card if available or by asking the caregiver to recall if no card is available. A vitamin A capsule should be shown to the caregiver when asked to recall.

**Diarrhoea in last 2 weeks:** caregivers are asked if their child had suffered from diarrhoea in the past two weeks.

#### **Optional indicators:**

**ORS and/or zinc tablets or syrup during diarrhoea episodes:** if the child is reported to have had a diarrhoea episode over the last two weeks, caregivers are asked if their child received an ORS sachet and/or a zinc tablet or syrup during the episode. An ORS sachet and a zinc tablet or syrup should be shown to the caregiver when asked to recall.

**Deworming:** caregivers are asked if their child received a deworming tablet / an anthelmintic medicine in the past six months for intestinal worms. In refugee camp settings, tablets such as mebendazole or albendazole are usually given to all eligible children (target age group varies depending on context; deworming tablets should not be given to children below 12 months) during vitamin A and/or vaccination campaigns. A tablet should be shown to the caregiver when asked to recall.

**MUAC (women):** please refer to the method described above for children. The same method is used in women however a different MUAC tape is used.

**Women coverage in Blanket Supplementary Feeding Programmes (BSFP):** if there is a blanket supplementary feeding programme, coverage of women (often pregnant women and lactating women with an infant less than 6 months aged 15-49 years) should be assessed.

## Material needed

- A supplies planning tool is provided to help in calculating the amount of equipment and supplies needed and to estimate the overall cost. See SENS Pre-Module tool: [**Tool 10**- Supplies Planning Tool]. 
- A list of international suppliers is provided in **Annex 2**.
- The Anthropometry and Health SENS questionnaire for children 6-59 months is shown in **Annex 3** or for women in **Annex 4**. See SENS Pre-Module tools: [**Tool 11**- Full SENS questionnaire] and [**Tool 12**- Full SENS Questionnaire with Instructions]. 

### Things to note:

- During data collection in MDC surveys, the anthropometric and haemoglobin measurements in children aged 6-59 months and women should be recorded in the SENS Pre-module SENS tool: [**Tool 14**- Participants and measures control sheet]. This allows surveyors to avoid registration mistakes and/or missing data. This tool also allows survey manager and/or supervisors to verify the recorded data within each questionnaire and possibly correct or complete missing and/or aberrant data. 

### Anthropometric measurements (children and women)

- Wooden height board;
- Weighing scale: Electronic scale (Uniscale). If not available, Salter scale (25kg) with hanging pants and cord can be used;
- A wooden board slightly larger than the electronic scale to stabilise it on the ground;
- Weighing scale carry bag;
- A stick to screen children's height (labelled at 67, 87 and 110cm);
- Children MUAC tape (adult tape if women are also measured);
- Technical forms for MDC surveys. Paper questionnaires for paper-based surveys (always carry extra copies);
- Weight/Height reference table (WHO Growth Standards 2006);
- Referral forms for moderately and severely acutely malnourished children found during the survey who are not already enrolled into a nutrition programme.

### Age

- Official age documentation collected from the caregivers;
- Local events calendar prepared prior to the survey start.

### **Measles vaccination**

- Questionnaire.

### **Vitamin A supplementation**

- Vitamin A capsule to show to the caregiver to help them recall accurately;
- Questionnaire.

### **Diarrhoea**

- ORS sachet used in setting to show to the caregiver to help them recall accurately (optional);
- Zinc tablet or syrup used in setting to show to the caregiver to help them recall accurately (optional);
- Questionnaire.

### **Deworming (if applicable)**

- A deworming tablet (i.e. mebendazole and/or albendazole) to show to the caregiver to help them recall accurately;
- Questionnaire.

### **Time of arrival (optional & only if applicable)**

- Questionnaire.

## Case definitions and calculations

### Acute malnutrition

**Weight-for-Height (WHZ)** is the nutritional index that reflects short term growth failure (acute malnutrition, e.g. wasting) and is defined by a child’s weight (kg) and height or length (cm) in relation to a standard or reference population of the same height. Acute malnutrition is defined using WHZ index values or the presence of oedema. The WHZ indices are expressed in z-scores according to the 2006 WHO Growth Standards. Acute malnutrition is classified as severe or moderate based on the cut-offs shown below. It is also used in the classification of global acute, moderate acute and severe acute malnutrition (GAM, MAM, SAM).

**TABLE 1 DEFINITIONS OF ACUTE MALNUTRITION USING WEIGHT-FOR-HEIGHT AND/OR OEDEMA IN CHILDREN 6-59 MONTHS**

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

**Mid Upper Arm Circumference (MUAC) in children** is considered to be an effective predictor of the risk of death when below 115mm in children aged 6-59 months (or >67cm in height). Low MUAC is also a widely used criterion for admitting children to nutrition treatment programmes. However, the weight-for-height index remains the most common index to quantify prevalence of wasting in surveys amongst refugees and other emergency affected populations.

MUAC and weight-for-height measurements do not necessarily identify the same children as being malnourished. Because children can be admitted to nutrition treatment programmes using either low weight-for-height or low MUAC, it is important to include both indicators in SENS surveys. This will allow the accurate estimation of the number of children who are eligible for admission to nutrition programmes. MUAC should be classified according to the following cut-offs:

**TABLE 2 MUAC MALNUTRITION CUT-OFFS IN CHILDREN 6-59 MONTHS**

Categories of low MUAC values
<125 mm
≥ 115 mm and <125 mm
< 115 mm

**MUAC in women:** Low MUAC is considered to be a predictor of nutrition status in women. There are however no international guidelines on the MUAC cut-offs to use in women. MUAC cut-offs and categories to use in women are to be adapted to each context. MUAC can be used for all women whether they are pregnant, lactating or not. The choice of which women to include for MUAC measurements in a SENS survey depends

largely on the information required, e.g. for a baseline assessment or for programme monitoring purposes. MUAC in women is usually needed in contexts where there is a BSFP in place for women; usually such programmes are for pregnant and lactating women.

See SENS Pre-Module tool for examples of MUAC cut-offs that can be used in women: [Tool 4- List of SENS indicators].



## Stunting

**Height-for-Age (HAZ)** is the nutrition index that reflects longer term growth failure (stunting) and is defined by a child's height (cm) and age (days or months) in relation to a standard or reference population of the same age. Stunting, also known as chronic malnutrition, is classified as severe or moderate based on the cut-offs shown below. Stunting is defined using height-for-age index values.

**TABLE 3 DEFINITIONS OF STUNTING USING HEIGHT-FOR-AGE IN CHILDREN 6-59 MONTHS**

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

## Underweight

**Weight-for-Age (WAZ)** is the nutrition index that reflects a combination of both chronic and acute growth failure. It is termed underweight and defined as a child's weight (kg) and age (days or months) in relation to a standard or reference population of the same age. Underweight is classified as severe or moderate based on the following cut-offs. Underweight is defined using the weight-for-age index values.

**TABLE 4 DEFINITIONS OF UNDERWEIGHT USING WEIGHT-FOR-AGE IN CHILDREN 6-59 MONTHS**

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

## Overweight

Overweight and obesity are among the main risk factors for metabolic diseases in the population such as diabetes, hypertension, cardiovascular diseases and cancer. Overweight in children aged 6-59 months can be measured using WHZ indices and can be classified based on the cut-offs shown below.

**TABLE 5 DEFINITIONS OF OVERWEIGHT USING WEIGHT-FOR-HEIGHT IN CHILDREN 6-59 MONTHS**

Categories of overweight	Z-scores (WHO Growth Standards 2006)
Overweight	>2 z-scores
Severe overweight	>3 z-scores

## Diarrhoea

Diarrhoea is defined as three or more loose or watery stools in a 24-hour period.

## Child enrolment in supplementary (TSFP) and therapeutic (OTP/SC) nutrition programme

Nutrition programme enrolment is estimated in a SENS survey using the direct method as follows (reference: Emergency Nutrition Assessment: Guidelines for field workers. Save the Children. 2004):

Enrolment into TSFP programme (%) =

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

Enrolment into TFP (OTP/SC) programme (%) =

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

## Child enrolment in blanket supplementary feeding programme

Enrolment into BSFP (%) =

$$100 \times \frac{\text{No. of surveyed children in the eligible age range who reported being registered in BSFP}}{\text{No. of surveyed children in the eligible age range}}$$

## Woman enrolment in blanket supplementary feeding programme

Enrolment into BSFP (%) =

$$100 \times \frac{\text{No. of surveyed women in the eligible category (e.g. PLW) who reported being registered in BSFP}}{\text{No. of surveyed women in the eligible category (e.g. PLW)}}$$

## Ethical considerations

### Referral process for malnourished children should be done as follows:

- If not already enrolled in a nutrition treatment programme, children found to be moderately or severely acutely malnourished should be referred for treatment according to the local treatment standards (if treatment facilities are available).
  - If referring patients, the agreement of the health facilities or nutrition centres should be obtained before the survey starts; and
  - The caregivers of malnourished children should be given a paper referral slip to take with them to the health facility or nutrition centre and a replicate of the referral slip should be given to the facility or nutrient centre for follow-up (**SAM cases need urgent follow-up**). See **Annex 5** or SENS Anthropometry and Health tool: [**Tool 3**- Referral form] for a referral slip to use during the survey.
- If a child is reported to be enrolled in a treatment facility / programme, the programme type should be verified with the card or bracelet and noted on the questionnaire.



### Referral process for malnourished women should be done using the local admission criteria and available services.

#### *Things to watch out for:*

- When referring children, use the local admission criteria (see the national protocol for the treatment of acute malnutrition), i.e. are WHO Growth Standards 2006 z-scores used for admission? Is MUAC used for admission?
- When referring children with MAM, ensure to refer them to a service where they can be registered for the targeted supplementary feeding programme (TSFP) and make sure to specify the time when the TSFP is running (teams should have the schedule of TSFP days).

## Standard procedure and quality assurance

- Refer to the **SMART Standardised Training Package** for the best-practice recommendation on collecting anthropometric data (see SMART references section).

### *Things to note:*

- Always measure the weight before the height as children often get agitated with height measurements.
- If there is more than one eligible child in the household, measure the less 'difficult' child first.
- Explain the procedure to the mother or caregiver and ask for authorisation to undress the child.
- It is highly recommended to use the electronic scales as this will provide better results. To avoid the scales wobbling when placed on uneven ground, they should be stood on a flat wooden board.
- Measuring equipment should be tested every day during the survey and the results recorded on a form. For an example of a form to use for this purpose see **Annex 6** or see SENS Anthropometry and Health tool: [**Tool 4**- Anthropometry Quality Assurance Log sheet]. Faulty equipment must be immediately replaced. The following should be checked on a daily basis:
  - Test each scale with a standard weight of at least 5kg.
  - Test each height board with a stick that is cut at 110.0cm and check the quality of the measuring tape glued onto the board.
  - Test the MUAC tapes with a plastic pipe with a circumference of about 15-20cm and check the quality of the MUAC tape. You might need to replace the MUAC tapes several times during a survey as they get ruined easily.



# Training

- Refer to the **SMART Standardised Training Package** for recommendations on training surveyors in anthropometric measurements (see SMART references section).
- Refer to **Annex 7** for illustrations depicting the standard procedures for anthropometric measurements that can be used while training.
- The training on anthropometric measurements will last at least two full days with a day on theory and practice, and a day on the standardisation exercise.

## *Things to watch out for:*

- **Table 6** describes the most common errors experienced by survey managers that should be considered and avoided.
- **Table 7** describes the most common errors experienced by survey teams in data collection. These should be emphasized during the training and the survey manager should focus on these when assessing the teams' performance during supervision throughout the survey.

## Common errors and challenges in training and data collection

**TABLE 6 COMMON ERRORS EXPERIENCED BY SURVEY MANAGERS**

Common errors	Examples	Solution
<b>Not using quality assured equipment</b>	Using measuring equipment without testing their calibration. For example, using a MUAC tape that is damaged; Using an electronic scale that is malfunctioning; Using a wooden height board with bad quality tapes.	Test the calibration of the equipment at the beginning of the survey and regularly during the survey; Ensure you have spare equipment so you can replace faulty or broken items during the survey.
<b>Not enough time spent on practising anthropometric measurements and assessment of oedema</b>	Starting the survey when the surveyors are not adequately trained. This will cause faulty measurements.	Include a practical training on anthropometric measurements in the field during the training.
<b>Not training surveyors because they are experienced</b>	Experienced surveyors are not provided with refresher training and measurement accuracy is compromised.	Always conduct refresher training as knowledge and practical skills can be lost over time. Bad habits can also be replicated.
<b>Not evaluating skills of surveyors at end of training</b>	Not evaluating surveyors at the end of the training and assuming that all of the concepts have been understood.	Always evaluate surveyors at the end of the training.
<b>Including a survey question that is not relevant for the given context</b>	Including the question on vitamin A supplementation coverage even though a campaign did not happen in the last 6 months. A vitamin A campaign should be done every 6 months in most contexts however it does not always happen.  Including a question on BSFP coverage even though such a programme does not exist.	Always make sure all questions are relevant to the context you work in.
<b>Asking a question to the wrong target age group</b>	Asking the deworming coverage question to all children aged 6-59 months even though only children aged 24-59 months were targeted.	Ensure to ask each question to the relevant target age groups.

**TABLE 7 COMMON ERRORS EXPERIENCED IN DATA COLLECTION**

Common errors	Examples	Solution
<b>Oedema is not well assessed</b>	Surveyors have been known to mistake a fat child for a child with oedema.	The manager should double-check the oedema cases, particularly when team members are inexperienced; The manager should pay close attention to see if oedema cases are spread evenly between teams or whether they are all found by one team. The latter may be suspicious and it is advisable to check the team's oedema assessment technique.
<b>Faulty weight measurement</b>	The standard procedure to measure weight is not followed well, resulting in inaccurate results. For example, heavy clothing (>50-100g) is left on the child during the weight measurement without reporting it on the questionnaire; Scale not calibrated to zero (Salter scale); Child is moving; Weight measurements are rounded to the nearest 0.0 or 0.5kg rather than 0.1kg.	Reinforce standard procedures during training and do practical exercises with real children.  <i>Note that rounding weight can have serious implications when calculating z-scores and may result in children having their nutritional status wrongly classified.</i>
<b>Faulty length/height measurement</b>	The standard procedure to measure length / height is not followed well, resulting in inaccurate results. For example, knees bent, feet extended, not removing footwear or headgear, head badly positioned and not in the correct plane, child not lying straight along board, sliding board not firmly against heels / head, measuring a child standing up when the measurement should be taken lying down; Height / length measurements are rounded to the nearest 0.0 or 0.5cm rather than 0.1cm.	Reinforce standard procedures during training and do practical exercises with real children.  <i>Note that rounding height can have serious implication when calculating z-scores and may result in children having their nutritional status wrongly classified.</i>
<b>Faulty MUAC measurement</b>	The standard procedure to measure MUAC is not followed well, resulting in inaccurate results. For example, tightening or loosening the MUAC tape too much, not measuring from the 'middle' the arm or measuring the right arm rather than the left.	Reinforce standard procedures during training and do practical exercises with real children.
<b>Imprecise age estimation or inaccurate recording</b>	When a document with the date of birth (such as vaccination card) is not available, age is not estimated well with a local events calendar. For example, the wrong birth year (errors of + or - 12 months) is recorded; Surveyors overestimate multiples of 12 (12, 24, 36, 48 months) due to the conversion of age in full years without refining the estimation; Surveyors do not include older children between 3.5 and 5 years of age because parents tell them that their child is over 5 years of age.	Include a practical training on age estimation and recording.  <i>Note that z-scores for height-for-age or weight-for-age require accurate ages.</i>
<b>Not calibrating the survey equipment regularly</b>	Checking the calibration of anthropometric equipment is not done daily and faulty equipment is used.	Ensure a log sheet is used to record information during the survey. Refer to SENS Anthropometry and Health Module <b>Tool 4- Anthropometry Quality Assurance Logsheet</b> , also shown in <b>Annex 6</b> .

Common errors	Examples	Solution
<b>Not properly recording the enrolment of the child into a nutrition programme</b>	The surveyors do not ask about the card of the nutrition programme and rely on the recall of the caregiver.	Ensure that surveyors confirm the enrolment of the children into nutrition programmes for the treatment of acute malnutrition with a card or bracelet where available.
<b>Referral for malnutrition not done</b>	The weight-for-height index (or MUAC) is not cross-checked and surveyors fail to refer a child with moderate acute malnutrition (children with severe acute malnutrition are more easily recognisable while those with moderate acute malnutrition can sometimes be difficult to identify visually).	Provide training on the referral process using local admission criteria for referral.
<b>Recording of weight as height or vice versa (applicable to paper-based surveys)</b>	When the team leader writes down the measurements on the questionnaire, s/ he writes down the weight and height measurements in the wrong cells.	Always double-check the questionnaire completeness and plausibility of responses / measurements before leaving the household by scanning the questionnaire.
<b>Not clearly telling the caregiver which type of vaccine the question is referring to</b>	When no EPI/health card is available, the caregiver is asked to recall whether the child was vaccinated against measles but this is not explained clearly (note that children under-5 get different types of vaccinations).  When a health record is available, the wrong vaccine is recorded.	Ensure to use the local term for measles vaccination and find out where on the body measles vaccination is typically given.  Ensure to train teams well on the different types of health records available and where to read the vaccination history.
<b>Recording that a vitamin A capsule was given in the last 6 months when in fact the child received it more than 6 months ago</b>	When a health record is available, the surveyor ignores the date the vitamin A supplement was given.  When no health record is available, the surveyor does not ask the caregiver to recall over the past six months <i>only</i> .	Ensure to record vitamin A supplementation received over the past six months <i>only</i> .
<b>Using the wrong definition of diarrhoea and not asking specifically about the 2 weeks preceding the survey</b>	The surveyor does not explain well what is meant by 'diarrhoea' and does not explain well the 2-week recall period.  The caregiver thinks that one loose stool in a 24-hour period represents diarrhoea.  The caregiver reports the child as having had diarrhoea even though the episode happened more than one month ago.	Ensure to train the surveyors well on the proper case definition of diarrhoea and the 2-week recall period.
<b>The deworming tablet is not shown to the caregiver</b>	The surveyor does not ask the question properly and does not show the deworming tablet/drug used during the last deworming campaign.	Ensure to have the tablets available to the teams and that they are shown to the caregiver.

## Questionnaire and instructions

- The Anthropometry and Health SENS questionnaire for children 6-59 months is shown in **Annex 3** or for women in **Annex 4**. See SENS Pre-Module tools: [**Tool 11**- Full SENS questionnaire] and [**Tool 12**- Full SENS Questionnaire with Instructions].
- The **tables 8-12** below provide instructions on the questionnaire for adaptation to the local context, explain the rationale of each question and highlight special instructions to be given to the surveyors.



**TABLE 8 ANTHROPOMETRY AND HEALTH MODULE: EXPLANATION OF QUESTIONS FOR SECTION CHILD1**

Question number/ Section CHILD1	Variable name	Question	Special Instructions
			<p>This section is to be administered to all children in the selected households between 0-59 months if the IYCF module is included, or 6-59 months if the IYCF module is not included.</p> <p>These questions need to be asked to the mother or the main caregiver.</p>
CH1	<b>ID</b>	ID number	<p>Include as many eligible children as there are in the household.</p> <p>The ID number is automatically generated in mobile data collection (MDC) surveys for each household starting at 1.</p>
CH2	<b>CH-CONST</b>	<p>Was consent given for conducting the interview and the measurements?</p> <p>1= Yes</p> <p>2= No</p>	<p>Ensure that you have introduced the team and informed them about the interview and the measurements.</p> <p>If answer is « 2 » (No), stop here for the child questionnaire.</p>
CH3	<b>CHNAME</b>	Name of the child	This is asked to facilitate the interview process. Usually only the first name is entered. The name of the child/respondent will not be used.
CH4	<b>SEX</b>	Sex of [NAME OF CHILD]?	Sex is recorded as male ("m") or female ("f").

Question number/ Section CHILD1	Variable name	Question	Special Instructions
CH5	<b>XDOBK</b>	Do you have an official age documentation for [NAME OF CHILD]?  1= Yes  2= No	<p>The exact date of birth (day, month, year) is recorded from either an EPI card, child health card or birth notification if available. Note that the ‘UNHCR manifest’ should <u>never</u> be used for recording the age of a child.</p> <p>If no reliable proof of age is available, age is estimated in months using a local events calendar or by comparing the selected child with a sibling or the child of a neighbor whose ages are known, and is recorded in months on the questionnaire (question CH7).</p> <p>If the child’s age can absolutely not be determined by using a local events calendar or by probing, the child’s height can be used for inclusion; the child must measure between 67 cm and 110 cm.</p> <p>This variable is not used during analysis. Refer to SENS Anthropometry and Health tool: <b>[Tool 2- Setting-up ENA software for SENS]</b> for guidance on how to format age data.</p> <p>If answer is « 2 » (No), go to CH7.</p>
CH6	<b>BIRTH-DAT</b>	[NAME OF CHILD]’s date of birth (Day/ Month/Year)  dd/mm/yyyy	<p>The exact birth date should only be taken from an age documentation showing day, month and year of birth.</p> <p>For paper-based surveys: record from age documentation. Leave blank if no valid age documentation.</p>
CH7	<b>MONTHS</b>	Age of [NAME OF CHILD] in months  <b>Lower limit=0 months (or 6 months if the IYCF module is included)</b>  <b>Upper limit=59.99 months</b>	<p>Since no age documentation is available, estimate age using a local events calendar.</p> <p>For paper-based surveys: if age documentation available, record the age in months from the date of birth.</p> <p>This is automatically calculated in MDC if birthdate is available.</p> <p>Refer to SENS Module 2 tool: <b>[Tool 1- Local events calendar]</b> for a model local events calendar with instructions on how to use and adapt.</p>

**TABLE 9 ANTHROPOMETRY AND HEALTH MODULE: EXPLANATION OF QUESTIONS FOR SECTION CHILD2 (OPTIONAL/IF APPLICABLE)**

Question number/ Section CHILD2	Variable name	Question	Special Instructions
			<p>This section is to be administered to all children in the selected households between 0-59 months (or between 6-59 months if the IYCF module is not included).</p> <p><b>Only include this section if the survey is being carried out in settings with recent/new influxes of refugees and there is a suspicion of different nutritional status among these new refugees.</b></p> <p>Explain to the respondent that these questions will be kept confidential and will not affect the assistance they receive / are entitled to.</p>
CH8	<b>CHAR-RIVE</b>	<p>Does [NAME OF CHILD] arrive to [<i>camp name / country of asylum</i>] before or after [INSERT THE EVENT RESPONSIBLE FOR THE INFLUX OF REFUGEES]?</p> <p>1= Arrived before [INSERT EVENT]</p> <p>2= Arrived after [INSERT EVENT] (new arrival)</p> <p>8= Don't know</p> <p>(OPTIONAL/IF APPLICABLE)</p>	<p>Adapt the question and the answer codes to the local setting by inserting the event responsible for the influx of refugees (e.g. before the conflict started).</p> <p>Any child who has been born in the camp / country of asylum after the rest of the family arrived due to the new event should be classed as a new arrival as well.</p>

**TABLE 10** ANTHROPOMETRY AND HEALTH MODULE: EXPLANATION OF QUESTIONS FOR SECTION CHILD3

Question number/ Section CHILD3	Variable name	Question	Special Instructions
			<p>This section is to be administered to all children between 6 and 59 months of age.</p> <p>These questions need to be asked to the mother or the main caregiver.</p> <p>In MDC surveys, this section is automatically skipped for the children not eligible based on age (&lt;6 months).</p>
CH9	<b>CHPRES</b>	<p>Is [NAME OF CHILD] currently present in the household?</p> <p>y= Yes</p> <p>n= No</p>	<p>If an individual is absent, the team leader should record this information and determine another time to return on the same day. The team should revisit an absent individual up to two times, if it is logistically feasible, on the same survey day and/or before leaving the survey area. If they are unsuccessful after this, the individual should be recorded as an absence and they should <u>not</u> be replaced with another household or individual.</p> <p>Refer to SENS pre-module tool: <b>[Tool 8- Data collection control sheet]</b> for a model tool to help track the absentees.</p> <p>If answer is “2” (No), go to CH16.</p>
CH10	<b>WEIGHT</b>	<p>[NAME OF CHILD]’s weight in kilograms (±0.1kg)</p> <p><b>Lower limit=3.0 kg</b></p> <p><b>Upper limit=31.0 kg</b></p>	<p>Children are weighed without clothes using an electronic scale (SECA). Measurements are taken to the closest 100 grams (0.1 kg).</p> <p>Leaving very light underwear on is acceptable if it is not possible to remove all clothing.</p> <p>Measuring equipment should be tested every day during the survey and the results recorded on a form. For an example of a form to use for this purpose see <b>Annex 6</b> or see SENS Anthropometry and Health tool: <b>[Tool 4- Anthropometry Quality Assurance Log sheet]</b>.</p>
CH11	<b>CLOTHES</b>	<p>Was the [NAME OF CHILD] dressed with clothes for the weight measurement?</p> <p>y= Yes</p> <p>n= No</p> <p>(OPTIONAL)</p>	<p>In certain cultures or climates, it might be inappropriate to undress children for weight measurements. This question should be used in settings where it is common to measure children with clothing.</p> <p>A light underwear does not count as clothes.</p> <p>For more details on how to adjust for weight of clothes, refer to SENS Anthropometry and Health tool: <b>[Tool 2- Setting-up ENA software for SENS]</b>.</p>

Question number/ Section CHILD3	Variable name	Question	Special Instructions
CH12	<b>HEIGHT</b>	<p>[NAME OF CHILD]'s length/height in cm (<math>\pm 0.1\text{cm}</math>)</p> <p><b>Lower limit=54.0 cm</b></p> <p><b>Upper limit=124.0 cm</b></p>	<p>Children's height or length is taken to the closest millimeter (0.1 cm) using a wooden height board (SHORR).</p> <p>In a context where official age documentation is available for most children, age should be used to decide how to measure a child. Children less than 24 months should be measured lying down while those 24 months or older should be measured standing up.</p> <p>In a context where age of children is mainly estimated from a local events calendar or by recall, height should be used to find out how to measure a child. Children less than 87cm are measured lying down, while those greater than or equal to 87cm are measured standing up. A screening stick labelled at 87cm may be used for helping to decide on the measurement method.</p> <p>Measuring equipment should be tested every day during the survey and the results recorded on a form. For an example of a form to use for this purpose see <b>Annex 6</b> or see SENS Anthropometry and Health tool: [<b>Tool 4-</b> Anthropometry Quality Assurance Log sheet].</p>
CH13	<b>MEASURE</b>	<p>Was [NAME OF CHILD] measured lying down or standing up?</p> <p>l= Child lying down</p> <p>h= Child standing up</p>	<p>This variable is coded "l" for length (child measured lying down) and "h" for height (child measured standing up).</p> <p>The ENA for SMART software will apply a correction factor and correct nutrition indices accordingly if a child is not measured as described in the protocol.</p> <p>For more details on this option in the ENA for SMART software, refer to SENS Anthropometry and Health tool: [<b>Tool 2-</b> Setting-up ENA software for SENS].</p>
CH14	<b>EDEMA</b>	<p>Clinical examination: Does [NAME OF CHILD] present bilateral pitting oedema?</p> <p>y= Yes</p> <p>n= No</p>	<p>Bilateral pitting oedema, also known as nutritional oedema, kwashiorkor or oedematous malnutrition, is a sign of severe acute malnutrition (SAM).</p> <p>It is defined by bilateral pitting oedema of the feet and verified when thumb pressure applied on top of both feet for three seconds leaves a pit (indentation) in both feet after the thumb is lifted. It is an abnormal infiltration and excess accumulation of serous fluid in connective tissue or in a serous cavity.</p> <p>All oedema cases reported by the survey teams should be verified by the survey manager and need immediate referral.</p>
CH15	<b>MUAC</b>	<p>[NAME OF CHILD]'s middle upper arm circumference (MUAC) in mm (<math>\pm 1\text{mm}</math>) or cm (<math>\pm 0.1\text{cm}</math>)</p> <p><b>Lower limit=70 mm</b></p> <p><b>Upper limit=235 mm</b></p>	<p>MUAC is always measured at the mid-point of the left upper arm.</p> <p>Depending on the context, MUAC can be measured in mm or in cm. Adapt the questionnaire accordingly.</p> <p>Don't forget the decimal when MUAC is measured in cm.</p> <p>Note that ENA for SMART software only accepts units in mm for MUAC.</p>

Question number/ Section CHILD3	Variable name	Question	Special Instructions
CH16	<b>ENROL</b>	<p>Is [NAME OF CHILD] currently being treated in [NAME OF NUTRITION PROGRAMMES] for malnutrition?</p> <p>1= Yes TSFP</p> <p>2= Yes TFP (OTP/ SC)</p> <p>3= No</p> <p>8= Don't know</p>	<p>Include the local names of the nutrition treatment programmes (e.g. TSFP, OTP, SC).</p> <p>The nutritional commodities provided in TSFP and TFP (OTP/SC) should be shown to the respondent.</p>
CH17	<b>BSFP</b>	<p>Is [NAME OF CHILD] currently enrolled in the BSFP?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p> <p>(IF APPLICABLE)</p>	<p>This question is only asked to children aged 6-23/6-35/6-59 months. Adapt to the eligible age range in the survey setting.</p> <p>Include the local name of the blanket supplementary feeding product (BSFP).</p> <p>The nutritional commodity provided in BSFP should be shown to the respondent.</p> <p>In MDC surveys, this question is automatically skipped for the children not eligible for the programme based on age. In paper-based surveys, ask this questions to all children aged 6-59 months to facilitate the interview process.</p>
CH18	<b>MEASLES</b>	<p>Has [NAME OF CHILD] been vaccinated against measles?</p> <p>1= Yes, card</p> <p>2= Yes, recall</p> <p>3= No or don't know</p>	<p>Measles vaccination is assessed by checking for the measles vaccine on the Expanded Programme on Immunization (EPI) card if available or by asking the caregiver to recall if no EPI card is available.</p> <p>This question is only asked to children aged 9-59 months.</p> <p>In MDC surveys, this question is automatically skipped for the 6-8 months old children. In paper-based surveys, ask this questions to all children aged 6-59 months to facilitate the interview process.</p>
CH19	<b>VITA</b>	<p>Has [NAME OF CHILD] received a vitamin A capsule in the past 6 months?</p> <p>1= Yes, card</p> <p>2= Yes, recall</p> <p>3= No or don't know</p>	<p>Vitamin A supplementation is assessed by checking on the EPI card/ health card if available or by asking the caregiver to recall if no card is available.</p> <p>A vitamin A capsule should be shown to the caregiver when asked to recall.</p>

Question number/ Section CHILD3	Variable name	Question	Special Instructions
CH20	<b>DE-WORM</b>	<p>Was [NAME OF CHILD] given any drug for intestinal worms in the last six months?</p> <p>1= Yes, card</p> <p>2= Yes, recall</p> <p>3= No or don't know</p> <p>(IF APPLICABLE)</p>	<p>Delete this question in settings where there was no deworming campaign in the last 6 months. Deworming campaigns in pre-school children are often done alongside vitamin A or vaccination campaigns.</p> <p>This question is only asked to children aged 12-59/24-59 months. Adapt to the eligible age range in the survey setting.</p> <p>This question relates to soil-transmitted helminths treated with mebendazole or albendazole. It is important to distinguish with schistosomes treated with praziquantel that require different medications.</p> <p>Ensure to obtain the deworming tablet used during the last deworming campaign.</p> <p>In MDC surveys, this question is automatically skipped for the children not eligible based on age. In paper-based surveys, ask this questions to all children aged 6-59 months to facilitate the interview process.</p>
CH21	<b>DIAR</b>	<p>Has [NAME OF CHILD] had diarrhoea in the past 2 weeks?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p>	<p>Case definition: three or more loose or liquid stools during 24 hours. Ensure that the definition of diarrhea is understood by the respondent.</p> <p>If answer is "2" (No) or "8" (Don't know), go to CH23.</p>
CH22	<b>DIARORS</b>	<p>Did you give [INSERT LOCAL NAME FOR WHO ORS] to [NAME OF CHILD] when s/he had diarrhoea?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p> <p>(OPTIONAL)</p>	<p>Ensure to add the local name for the ORS sachets given out at health centres.</p> <p>An ORS sachet used in the setting should be shown to the caregiver when asked to recall.</p>
CH23	<b>DIARZ-INC</b>	<p>Did you give zinc tablets or syrup to [NAME OF CHILD] when s/he had diarrhoea?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p> <p>(OPTIONAL)</p>	<p>Ensure to add the local name for the zinc tablets or syrup given out at health centres or found in local pharmacies.</p> <p>A zinc tablet or syrup used in the setting should be shown to the caregiver when asked to recall.</p>

Question number/ Section CHILD3	Variable name	Question	Special Instructions
CH26	<b>REFMAM /REFSAM</b>	<b>Automatic referral for child with signs of acute malnutrition who is not already enrolled in a nutrition programme</b>	<p><b>Child needs to be referred for moderate acute malnutrition (if MUAC&lt;125mm and MUAC≥115 mm and/or WHZ&lt;-2 and WHZ≥-3 and if ENROL equals to 3 or 8).</b></p> <p><b>Child needs to be referred for severe acute malnutrition (if MUAC&lt;115mm and/or WHZ&lt;-3 and/or bilateral pitting oedema is yes and if ENROL equals to 3 or 8).</b></p> <p>Fill out a referral form: one slip is for the mother/caregiver and the other is for the health facility.</p> <p>Adapt the admission criteria cut-offs to the survey context.</p> <p>Refer to SENS Anthropometry and Health tool: [<b>Tool 3</b>- Referral form] for an example of a referral slip to use during the survey. This variable is not used during analysis.</p>

**TABLE 11 ANTHROPOMETRY AND HEALTH MODULE: EXPLANATION OF QUESTIONS FOR SECTION WM1**

Question number/ Section WM1	Variable name	Question	Special Instructions
			<p>This section is to be administered to all eligible women aged between 15 and 49 years in the selected households.</p> <p>These questions need to be asked to each eligible woman.</p>
WM1	<b>WMID</b>	ID Number	<p>Include as many eligible women as there are in the household.</p> <p>The ID number is automatically generated in MDC surveys for each household starting at 1.</p>
WM2	<b>WM-CONST</b>	<p>Was consent given for conducting the interview and the measurements?</p> <p>1= Yes</p> <p>2= No</p> <p>3= Absent</p>	<p>Ensure that you have introduced the team and informed them about the interview and the measurements.</p> <p>If an individual is absent, the team leader should record this information and determine another time to return on the same day. The team should revisit an absent individual up to two times, if it is logistically feasible, on the same survey day and/or before to leave the survey area. If they are unsuccessful after this, the individual should be recorded as an absence and they should not be replaced with another household or individual.</p> <p>Refer to SENS Pre-module tool: [<b>Tool 8</b>- Data collection control sheet] for a model tool to help track the absentees.</p> <p>If answer is « 2 » (No) or « 3 » (Absent), stop here for the woman questionnaire.</p>
WM3	<b>WM-NAME</b>	Name of the woman	<p>This is asked to facilitate the interview process. Usually only the first name is entered. The name of the respondent will not be used.</p>
WM4	<b>WMAGE</b>	<p>Age of [NAME OF WOMAN] in years</p> <p><b>Lower limit=15 years</b></p> <p><b>Upper limit=49 years</b></p>	<p>Only women between 15 and 49 are being interviewed.</p> <p>Reported age is recorded. You do not need to see proof of age showing official date of birth.</p>

**TABLE 12 ANTHROPOMETRY AND HEALTH MODULE: EXPLANATION OF QUESTIONS FOR SECTION WM2**

Question number/ Section WM2	Variable name	Question	Special Instructions
			<p>This section is to be administered to all eligible women between 15 and 49 years in the selected household.</p> <p>These questions need to be asked to each eligible woman.</p>
WM5	<b>PREG-NANT</b>	<p>Are you pregnant?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p>	<p>Make sure to adapt the question to the context to ensure that it is asked in a culturally acceptable manner.</p> <p><b>If the answer is « No » or « Don't know », the woman should still be assessed for anaemia and it will be assumed that she is not pregnant.</b></p> <p>In some settings, MUAC is only measured in pregnant and lactating women (PLW). Skip patterns will need to be added here in order to only measure MUAC in PLW.</p> <p>If answer is « 2 » (No) or « 8 » (Absent), go to WM8.</p>
WM6	<b>ANC</b>	<p>Are you currently enrolled in the ANC programme?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p>	<p>Make sure to use the local name given to the ANC programme.</p> <p>This question is only for pregnant women, i.e. women who answered "Yes" to the previous question (WM5).</p>
WM7	<b>FEREC</b>	<p>Are you currently receiving iron-folate pills?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p>	<p>Make sure to use the local name given to the iron-folate tablet.</p> <p>An iron-folate tablet used in the setting should be shown to the respondent when asked to recall.</p> <p>This question is only for pregnant women, i.e. women who answered "Yes" to the previous question (WM5).</p>
WM8	<b>LACTAT</b>	<p>Are you currently breastfeeding?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p>	<p>In some settings, MUAC is only measured in pregnant and lactating women (PLW). Skip patterns will need to be added here in order to only measure MUAC in PLW.</p> <p>If answer is « 2 » (No) or « 8 » (Don't know), go to WM10.</p>
WM9	<b>LACTA-TU6</b>	<p>Is the child you are breastfeeding younger than 6 months old?</p> <p>1= Yes</p> <p>2= No</p> <p>8= Don't know</p>	<p>If the mother is breastfeeding more than one child, as long as one is younger than 6 months old, choose answer option "1" (Yes).</p>

Question number/ Section WM2	Variable name	Question	Special Instructions
WM10	<b>WMBSFP</b>	Are you currently enrolled in the BSFP?  1= Yes  2= No  8= Don't know  (IF APPLICABLE)	This question is only asked to pregnant and lactating women with an infant less than 6 months of age.  Include the local name of the blanket supplementary feeding product (BSFP).  The nutritional commodity provided in BSFP should be shown to the respondent.  In MDC surveys, this question is automatically skipped for the women not eligible for the programme based on their physiological status. In paper-based surveys, ask this questions to all women aged 15-49 years to facilitate the interview process.
WM11	<b>WM-MUAC</b>	[NAME OF WOMAN]'s MUAC in mm ( $\pm 1$ mm) or cm ( $\pm 0.1$ cm)  <b>Lower limit=160 mm</b>  <b>Upper limit=500 mm</b>  (OPTIONAL)	MUAC is always measured at the mid-point of the left upper arm.  Depending on the context, MUAC can be measured in mm or in cm. Adapt the questionnaire accordingly.  Don't forget the decimal when MUAC is measured in cm.
WM14	<b>WMREF-MAL</b>	<b>Automatic referral for woman with signs of acute malnutrition</b>	The referral for woman with signs of acute malnutrition will be included only if MUAC is measured ( <b>WMMUAC</b> ).  Adapt the admission criteria cut-offs to the survey context. For example, <b>woman needs to be referred for acute malnutrition if MUAC &lt; 210 mm.</b>  Fill out a referral form: one slip is for the woman and the other is for the health facility.  Refer to SENS Anthropometry and Health tool: [ <b>Tool 3- Referral form</b> ] for an example of a referral slip to use during the survey. This variable is not used during analysis.

# Setting-up ENA for smart software for SENS



- Brief guidance on setting up the ENA for SMART software for SENS surveys is provided in the SENS Anthropometry and Health tool: [**Tool 2**- Setting up ENA for SMART software for SENS]. Guidance on the following topics is provided:
  - Background on ENA for SMART software;
  - Formatting dates;
  - Data entry screen overview and detailed instructions on setting-up the screen for SENS surveys;
  - Option screen overview and detailed instructions on setting-up the screen for SENS surveys;
  - Analysis of the ENROL variable (for determining the enrolment into the targeted supplementary (TSFP) and therapeutic (OTP/SC) nutrition programmes for children aged 6-59 months);
  - Background on the various types of flags.
- Free guidance on the use of ENA for SMART software can be found in the **SMART initiative documentation** (see SMART references section).

## Data review

- Refer to SENS Pre-module Tool: [**Tool 15**- Standard Operating Procedure (SOP) for SENS data management] for guidance on how to conduct these checks.



### Daily questionnaire check and overseeing interviews- for consistency, completeness and missing data

- The survey manager and supervisors will not have the chance to observe every interview conducted but they are responsible for reviewing every questionnaire for errors. Reviewing questionnaires should be done in the field, if possible, so that any problem can be resolved immediately and if not then at the end of each day.
- While in the field or at the end of each field work day, look at the filled forms on the smartphones (or the questionnaires if a paper-based survey was conducted) from each team and follow the procedure described below:
  - Check that consent was given for the interview (variable: CHCONST, WMCONST). If consent was not given, ask the surveyors if they know the reasons. If there are many refusals, understanding why will help clarify any misunderstandings, concerns or misconceptions with the community being surveyed.
  - Check for missing data and 'don't know' answers (these should always be minimal). If there are missing values, the survey teams should be told the next day to be more careful and not miss any question. If there is a significant number of 'don't know' answers for certain teams, the survey manager or supervisor(s) should accompany the teams the next day to the field to check on the way they conduct the interviews.
  - Check that referral was done appropriately in case acute malnutrition was detected (check data collection control sheet for that information and variables REFAM/REFSAM and WMREFMAL).

### Database check

- Brief guidance on the data review process is provided in **Annex 9** using Epi Info 7 and in the SENS Pre-module Tool: [**Tool 15**- Standard Operating Procedure (SOP) for SENS data management].
- Free guidance on the use of Epi Info for Windows and training material on Epi Info can be found at the following site: <http://www.cdc.gov/EpiInfo>

## Checking for missing data

- For each missing data relating to the basic anthropometric indicators (i.e. sex, age, weight, height, oedema, MUAC), find out the corresponding child and woman, and check the values manually entered in the participants and measures control sheet (for paper-based surveys, check with the original questionnaire). If it was a data entry error into the smartphones (or on the paper questionnaire), correct it.

## Sex

- Screen for missing sex values to identify data entry oversights (variable name: SEX).
- If sex is missing (even after checking the participants and measures control sheet, assess whether or not the child can be found the next day to determine the sex. If not, then the child cannot be included in the anthropometric analysis because the reference population information on height and weight is sex specific and no nutritional indices can be derived. The child can still be included in the analysis for oedema (because any child with oedema is severely malnourished) and in the other analyses not requiring sex (e.g. MUAC, measles vaccination, vitamin A supplementation, diarrhoea, deworming).

## Age

- Screen for missing age values (variable name: MONTHS) and determine if this was a data entry oversight or if the child was recruited on the basis of height (see Figure 1 for the decision tree on how to collect age data). You should ask the survey team to explain why age is missing.
- If age is missing (even after checking the participants and measures control sheet), assess whether or not the child can be found the next day to determine the age. If not, then the child cannot be included in the assessment of stunting (height-for-age), underweight (weight-for-age), measles vaccination or deworming coverage. However, the child can still be included in the analysis for wasting (weight-for-height), oedema and other indicators not requiring age (e.g. MUAC, vitamin A supplementation, diarrhoea). You will need to ensure the child is eligible to be in the survey based on the height / length (i.e. in the required height range of 67-110cm).

## Weight

- Screen for missing weight values to identify data entry oversights (variable name: WEIGHT).
- If weight is missing (even after checking the participants and measures control sheet), assess whether or not the child can be found the next day to determine the weight. If not, then the child cannot be included in the assessment of wasting (weight-for-height) or underweight (weight-for-age). However, the child can still be included in the analysis for oedema, stunting (height-for-age) and other indicators (e.g. MUAC, measles vaccination, vitamin A supplementation, diarrhoea, deworming) because these do not require weight.

## Height

- Screen for missing height values to identify data entry oversights (variable name: HEIGHT).
- If height is missing (even after checking the participants and measures control sheet), assess whether or not the child can be found the next day to determine the height. If not, then the child cannot be included in the assessment of wasting (weight-for-height) or stunting (height-for-age). However, the child can still be included in the analysis for oedema, underweight (weight-for-age) and other indicators (e.g. MUAC, measles vaccination, vitamin A supplementation, diarrhoea, deworming) because these do not require height.

## Oedema

- Screen for missing oedema values to identify data entry oversights (variable name: EDEMA).
- If oedema is missing (even after checking the [insert name of MDC tool/form]), assess whether or not the child can be found the next day to determine if oedema is present or absent. If this is not possible, then the child cannot be included in the assessment of oedema. However, the child can still be included in the other anthropometric analysis and other indicators (e.g. MUAC, measles vaccination, vitamin A supplementation, diarrhoea, deworming) because these do not require oedema.

## MUAC (children and/or women)

- Screen for missing MUAC values to identify data entry oversights (children variable name: MUAC; women variable name: WMUAC).
- If MUAC is missing (even after checking participants and measures control sheet), assess whether or not the child or the woman can be found the next day to measure the MUAC. If not, then the child or the woman cannot be included in the MUAC analysis.

## Child enrolment in nutrition programme

- Screen for missing values to identify data entry oversights (variable names: ENROL, BSFP).
- If one of the child enrolment in nutrition programme variables is missing, then the child cannot be included in the nutrition programme enrolment analysis.

## Measles vaccination

- Screen for missing measles vaccination values to identify data entry oversights (variable name: MEASLES).
- If measles vaccination is missing, then the child cannot be included in the measles vaccination analysis.

### **Vitamin A supplementation in last 6 months**

- Screen for missing vitamin A supplementation values to identify data entry oversights (variable name: VITA).
- If vitamin A supplementation is missing, then the child cannot be included in the vitamin A supplementation analysis.

### **Diarrhoea in last 2 weeks, and use of ORS and zinc**

- Screen for missing diarrhoea values and use of ORS or zinc values to identify data entry oversights (variable names: DIAR, DIARORS, DIARZINC).
- If diarrhoea, ORS or zinc values are missing, then the child cannot be included in the diarrhoea-related analysis.

### **Deworming in last 6 months**

- Screen for missing deworming values to identify data entry oversights (variable name: DEWORM).
- If deworming is missing, then the child cannot be included in the deworming analysis.

### **Time of arrival**

- Screen for missing time of arrival values to identify data entry oversights (variable name: CHARRIVE).
- If time of arrival is missing, then the child cannot be included in the time of arrival analysis.

## **SMART plausibility check on anthropometric data- for flags/extreme nutritional index values and measurement bias**

- The plausibility check is one of the key tools in SMART for data review of the anthropometric data. It allows evaluation of the quality of the anthropometric data and identification of specific types of errors, such as digit preference.
- The plausibility report focuses on the analysis of acute malnutrition / wasting because this is the primary outcome in most nutrition surveys conducted in emergencies.
- The plausibility check analyses the characteristics of the anthropometric data using various statistical approaches. It uses the results from these various statistical tests to provide an evaluation of the anthropometric data based on different criteria, for each individual survey team and also provides an overall score for the survey.

- Some sections of the plausibility report need to be looked at regularly and on a daily basis during survey implementation in order to target the teams to supervise and improve the way anthropometric data is being collected. Other sections need to be looked at only after data collection is complete for data review, final analysis and interpretation (**see the following sections for guidance on how to use it**).
- All tests done by the plausibility check should be considered in their entirety, taking into account the context and interpretation of the results before decisions on the validity of the data are made. The different tests are meant to draw attention to areas where there may be possible problems but, by themselves, should not be used to accept or reject data. The higher the score, the more problematic the survey may be. A 'problematic' score above 25% should lead to a careful examination of the anthropometric data for all teams and by team but, by itself, does not necessarily mean that the data is of poor quality.
- When the quality of the anthropometric data is not sufficient at the end of the survey, SMART provides recommendations for the reporting of malnutrition results to ensure the data can be used and results are not rejected.
- Refer to **Annex 8** for a detailed description of the SMART Plausibility check. Refer to the **SMART Initiative documentation** (see SMART references section).

## Daily SMART PLAUSIBILITY check

- At the end of each survey day, anthropometric data should be transferred / entered in the ENA software in order to generate the plausibility check report. The plausibility check results can be used to identify and correct mistakes as they happen.
- See SENS Pre-module tool: [**Tool 15**- Standard Operating Procedure (SOP) for SENS data management] for guidance on how to transfer the data from the csv data files produced by the smartphones to ENA when conducting an MDC SENS survey. 
- The following should be checked on a daily basis:
  - There should not be an over-representation of ages ending in whole years such as 12, 24, 36 and 48.
  - Check that surveyors are not rounding weight, height and MUAC measurements to .0 / 0 or .5 / 5. Note that, if an electronic scale is used, there is no need to check for rounding of weight values.
  - There should be a limited number of pink flags for the nutritional indices (i.e. WHO flags). Refer to procedure on how to set the WHO flags in ENA for SMART software: [**Tool 2**- Setting up ENA for SMART software for SENS]. 
  - Check that oedema is not being over-reported by certain teams. Note that it is recommended that survey supervisors / managers double-check all oedema cases seen during the survey.

## End of survey SMART plausibility check

- The following SMART quality criteria should be carefully assessed and presented in the final SENS nutrition survey report:
  - Missing values and flagged data
  - Sex ratio
  - Age distribution and age ratio
  - Digit preference for weight, height and MUAC
  - Standard deviation of WHZ
- These quality criteria have been selected for the UNHCR SENS report because they are the most frequently used ones to date and are the easiest ones to interpret. See **Annex 8** for a detailed guidance on these quality criteria.
- Instructions for presentation of the SMART quality criteria from the Plausibility Report in the final SENS report are as follows:
  - If Plausibility Check overall score  $\leq 25\%$ , only show the overall data quality summary table in the Annex of the SENS report.
  - If Plausibility Check overall score  $>25\%$ , carefully examine the anthropometric data for all teams and by teams; and show the details of the problematic areas in the Annex of the SENS report along with a short interpretation. UNHCR HQ / Regional Offices should be contacted for assistance in analysing problematic scores from the SMART Plausibility Check reports.

## Presentation of results

- Results from anthropometric measurements, nutrition programmes, measles vaccination, vitamin A supplementation, diarrhoea and deworming should be descriptive and presented as proportions (with 95% CI) and means for the overall sample and according to sex- and age-specific criteria where applicable.
- When presenting the results from several camps with a representative sample drawn from each camp into one report, results can be presented two different ways: i) reporting results for each indicator from each camp separately or ii) combining results from all camps into one table per indicator. See SENS Pre-Module tools: [**Tool 19**- Dolo SENS Report 2017] and [**Tool 20a**- Jordan SENS Report 2016]. 
- When several camps are surveyed with a representative sample drawn from each camp, it is sometimes necessary and important to report combined results. Weighting the data will need to be done if you have conducted surveys in a number of different camps or areas, and need to combine the results for reporting or planning purposes. It is not required to report the combined results for all indicators or to report the confidence intervals for the combined estimates. See the SENS Pre-Module tool that will automatically generate weighed results for proportions and means: [**Tool 21**- Weighting Data Tool]. 
- The main anthropometric results should be reported using WHO Growth Standards 2006 (z-scores only). Results using the NCHS Growth Reference 1977 (z-scores and percentage of the median) are no longer recommended to be presented in the Annex of the report, given that the WHO Growth Standards have been adopted starting in 2009.
- All survey reports should present results the tables and figures shown below.
- Where an exhaustive methodology is used, confidence intervals should not be presented because all eligible children are measured for anthropometry and health indicators.

## Result tables and figures

- For guidance on setting up the ENA for SMART software, refer to: [Tool 2-Setting up ENA for SMART software for SENS].

### Children 6-59 months

#### Sample size and clusters (where applicable)

**TABLE 13 SAMPLING INFORMATION**

	Total planned	Total surveyed	% of target	Non-response rate (%)
<b>Number of clusters (where applicable)</b>	See footnote 1	See footnote 2		n/a
<b>Number of households</b>	See footnote 3			
<b>Number of children 6-59 months</b>	See footnote 3	See footnote 4		

- This number can be taken from ENA for SMART planning screen as shown in the image below or from the protocol:

- This number can be taken from ENA for SMART Data Entry screen (CLUSTER column).
- This number can be taken from ENA for SMART planning screen or from the SENS protocol (see **Figure 2** below).
- This number can be taken from ENA for SMART by looking at the Data Entry screen of ENA for SMART and scrolling down to the last entered child (see **Figure 3** below).

**FIGURE 2 TOTAL NUMBER OF CHILDREN AGED 6-59 MONTHS PLANNED TO BE SURVEYED (TARGET SAMPLE SIZE)**

The target sample size was N=305 in this example. This corresponds to 514 households.

**Name of Survey**

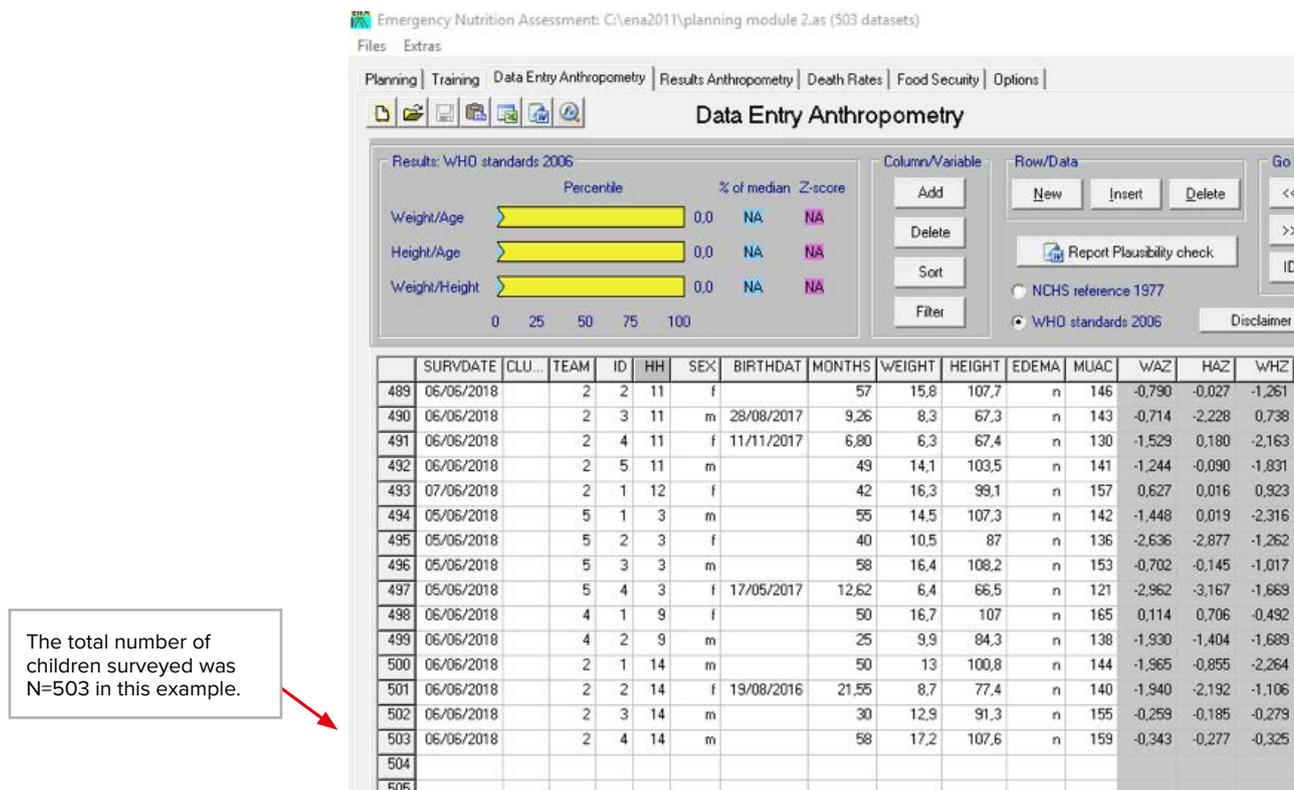
**Sampling**  
 Random  Cluster

Correction small population size

**Sample size calculation for a cross sectional anthropometric survey\***

<input type="text" value="27.3"/> Estimated prevalence %	<input type="text" value="4.7"/> Average household size
<input type="text" value="5"/> ± desired precision %	<input type="text" value="16.5"/> % children under 5
<input type="text" value="1"/> Design effect	<input type="text" value="15"/> % of non-response households
<b>305</b> Children to be included	<b>514</b> Households to be included

**FIGURE 3** TOTAL NUMBER OF CHILDREN AGED 6-59 MONTHS SURVEYED



**Sample size of children 6-59 months**

- Usually, the sample size reached in total number of children aged 6-59 months should be equal to or exceed the target sample size. If this is not the case, follow the procedure provided below for additional sampling.

**Total number of clusters**

- Usually, the total number of clusters surveyed should be equal to the total number of clusters planned. If this is not the case, follow the procedure provided below for additional sampling.

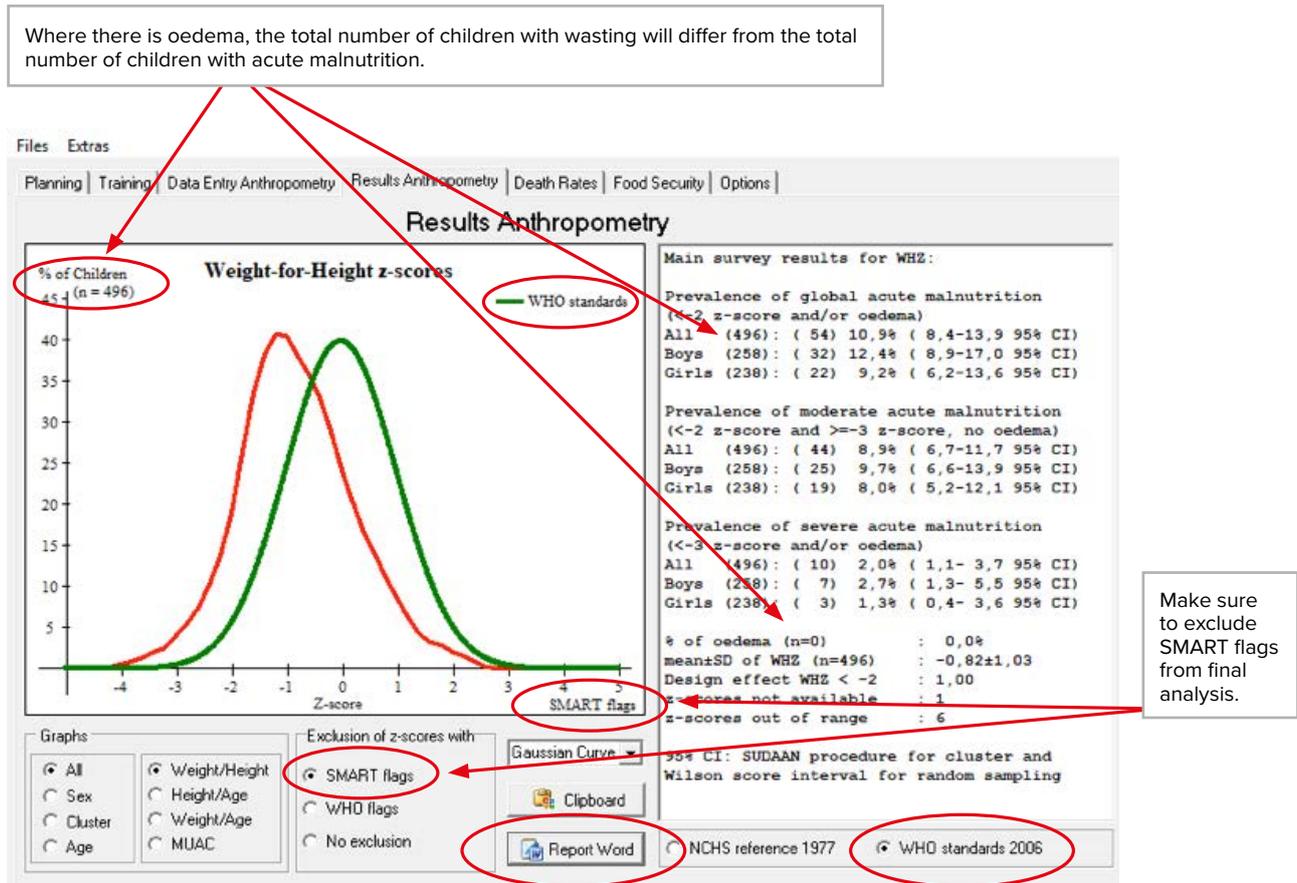
**Additional sampling**

- Additional sampling may need to be done when the target sample size has not been reached or when the target number of clusters has not been reached. The survey manager should make sure to mention the procedure used in the final report:
  - **Procedure to follow when the target sample size has not been reached:** If less than 80% of the target sample size of children aged 6-59 months was achieved by the end of the survey, the following should be done. Otherwise, no additional sampling is needed:
    - o For *simple or systematic random sampling surveys*, another sample of households from the whole population should be taken to boost the sample size of children. This sample should be 25% of the original sample size. *For example*, if 350 children aged 6-59 months were sampled but the target sample size was 500 children (hence you achieved 70% of the target sample size), this means that you would need to randomly select an additional 125 children (25% of 500 children).
    - o For *cluster sampling surveys*, the replacement clusters (RCs) automatically selected by ENA software should be sampled.
  - **Procedure to follow when the target number of clusters has not been reached:** All of the replacement clusters (RCs) automatically selected by ENA for SMART in the planning stage should be sampled if 10% or more of your original clusters were not completed for various reasons (including security, refusal or problems with access). Otherwise, no additional sampling is needed. For example, if you were supposed to survey 30 clusters but were only able to survey 26, you then need to sample the RCs selected by ENA at the end of the survey. If you surveyed 28 clusters instead of 30, then no additional sampling is needed.
  - When conducting additional sampling, if the same household or individual is re-selected by chance from the list or within the cluster area, they should be skipped and not surveyed twice. They should not be replaced. Note that it is possible that a replacement cluster (RC) is sampled from the same area as an original cluster and that this is acceptable.

### Automatic SMART report

- ENA for SMART automatically generates a nutrition survey report with some tables (see **Figure 4** and **Figure 5** below).

**FIGURE 4** GENERATING A NUTRITION SURVEY REPORT TEMPLATE CONTAINING COMPLETED, STANDARD RESULTS TABLES



**FIGURE 5** SETTING UP THE ENA FOR SMART OPTION SCREEN FOR DATA ANALYSIS

Users should manually modify the age groups in months displayed by default in the ENA software in the "Options" screen in order to be able to carry out the various analyses by age group recommended to present in the SENS final report. By default, the ENA software proposes the following age groups: 6-17 months; 18-29 months; 30-41 months; 42-53 months and 54-59 months. The recommended age groups for the analysis of a SENS survey are as follows: 6-11 months; 12-23 months; 24-35 months; 36-47 months and 48-59 months. This is to make the age groups more meaningful in respect to common nutrition target groups in refugee nutrition programmes. Make these changes in the left column.

Users should manually uncheck the Household Number box. This is because there may be more than one eligible child per household; and when entering data, it is easier if the household number is not automatically filled in by the software.

Emergency Nutrition Assessment: (0 datasets)

Files Extras

Planning | Training | Data Entry Anthropometry | Results Anthropometry | Death Rates | Food Security | Options

### Options

**Data Entry:**

Automatic fill out of

Survey date     Cluster

Team No.         ID

Household No.

Entering of age mainly

with birthday     with months

Entering of Data

directly as 1.1.99, 10199 or 010199

with Pull Down Editors

Showing columns for measure, clothes and weighting variables

Weight for subtraction of clothes

0 gram

Program for Output

MS-Office     OpenOffice

c:\Program Files (x86)\Microsoft Office\root\Offi

**Reports:**

Age groups (months)

Age groups (months)	male	female
6 - 11	1000	1000
12 - 23	975	975
24 - 35	945	945
36 - 47	930	930
48 - 59	920	920

Expected proportion of children for plausibility check of sampling

For anthropometry analyzing children only from

6.00 to 59.99 months

67.0 to 110.0 cm

MUAC cut-offs

115 mm

125 mm

Exclusion of z-scores from

Observed mean

SMART flags

WHZ -3 to 3

HAZ -3 to 3

WAZ -3 to 3

Zero (reference mean)

WHO flags

WHZ -5 to 5

HAZ -6 to 6

WAZ -6 to 5

No exclusion

Reset

Make sure to analyse children aged 6-59 months only and to exclude from analysis SMART flags.

## Figures and trends

- There are several figures that are recommended to be included in the final SENS report that are not automatically generated by ENA for SMART. Refer to **SENS Pre-Module Step 15** for a description on constructing graphs and on how to interpret trends and differences. For a tool that will automatically generate trend graphs, see SENS Pre-Module tool: [**Tool 17-** Trends and Graphs].
- Showing the recommended figures will allow for the assessment of trends. Note that, to identify a trend, it is advised that prevalence data from at least three time points are obtained from SENS surveys carried out at similar times of the year. Trend analyses need to be interpreted with caution. Nevertheless, they can be useful for assessing the situation and major differences seen from year to year should warrant further investigation. The confidence intervals are an integral part of the results. Assessment and interpretation of changes over time should take into consideration population arrivals/departures, outbreaks, major changes in assistance, new nutrition programmes etc.



## Age and Sex Distribution

**TABLE 14** CHILDREN 6-59 MONTHS - DISTRIBUTION OF AGE AND SEX OF SAMPLE

*(THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE, MAKE SURE TO CHANGE THE SMART-RECOMMENDED AGE BREAKDOWN TO THE ONE RECOMMEND BY SENS AS SHOWN BELOW AND IN FIGURE 5 ABOVE)*

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:Girl
6-11 months							
12-23 months							
24-35 months							
36-47 months							
48-59 months							
<b>Total</b>							

### Things to note:

- The proportion of children with no exact birthdates that is provided in the SMART Plausibility report of ENA for SMART software should be reported at the bottom of **Table 14** in the final SENS report. This is useful for example to interpret the reliability of stunting and underweight data (both indicators use age).
- The percentage of children recruited on the basis of height (where applicable) should also be reported in the SENS survey report at the bottom of **Table 14**.

**Time of arrival (optional/if applicable)**

**TABLE 15** CHILDREN'S ARRIVAL PROFILE (OPTIONAL/IF APPLICABLE) (ADAPT THE ARRIVAL PROFILE CATEGORIES SO THAT IT MAKES THE MOST SENSE FOR THE LOCAL SETTING)

Arrival profile	Number/total	% (95% CI)
<p><b>Living in the camp/asylum country before</b> [ADAPT TO THE LOCAL SETTING THE EVENTS THAT PROVOKED THE INFLUX]</p> <p>E.g.: Living in the camp/asylum country before conflict started/new influx, etc.</p>		
<p><b>New arrival in the camp/asylum country after</b> [ADAPT TO THE LOCAL SETTING THE EVENTS THAT PROVOKED THE INFLUX]</p> <p>E.g.: New arrival (6 months or less)</p>		

**Things to note:**

- This is optional to collect in SENS. **It is only recommended to include this data in a SENS conducted in a setting with recent/new influxes of refugees and where there is a real suspicion or reason to believe that there is a different nutritional status among these new refugees.**
- GAM results should usually not be disaggregated by time of arrival unless it is planned during sample size calculation (i.e. stratification). However, it is sometimes justifiable to present GAM by time of arrival (typically 2 categories: new arrivals vs older stayers). It should only be done if precision is good enough in the disaggregated groups. Seek guidance from UNHCR HQ / Regional Offices if other results need to be disaggregated by time of arrival.

**Anthropometric data**

**TABLE 16** PREVALENCE OF ACUTE MALNUTRITION BASED ON WEIGHT-FOR-HEIGHT Z-SCORES (AND/OR OEDEMA) AND BY SEX (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

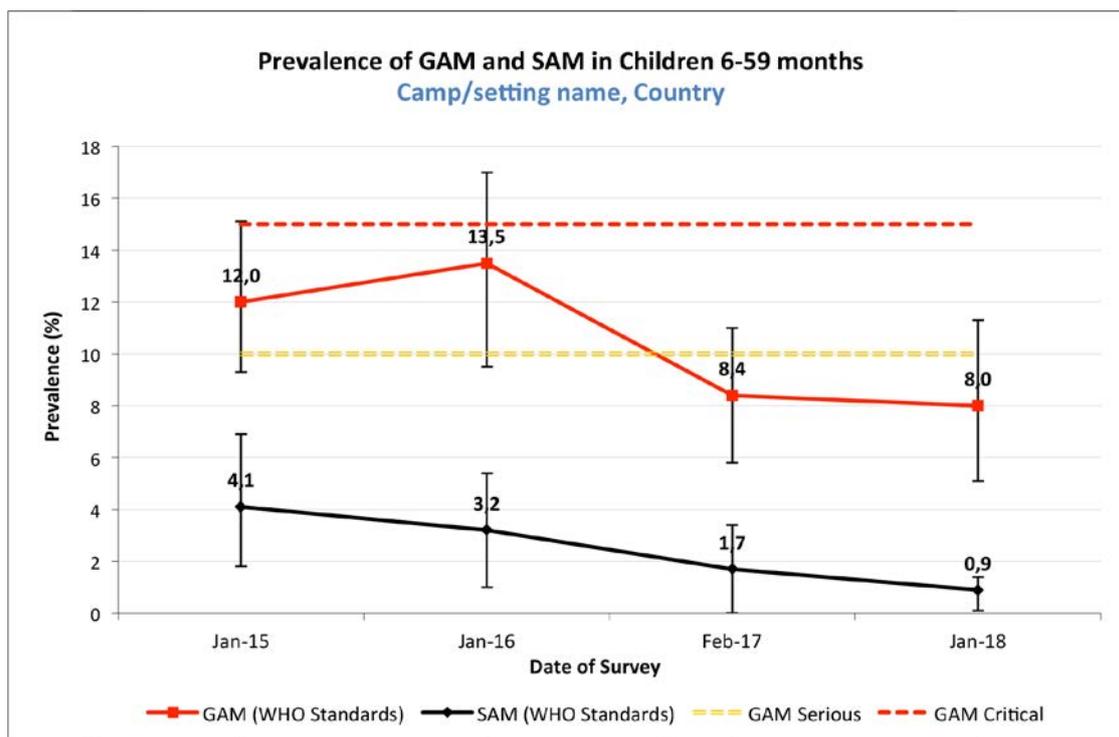
	All n =	Boys n =	Girls n =
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of moderate malnutrition (<-2 z-score and ≥-3 z-score, no oedema)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)

The prevalence of oedema is %

**Things to watch out for:**

- Often people disaggregate the main survey results by children’s age, nationality, resident status or even cluster to conduct statistical analyses and compare results without considering the limitations of doing so. These analyses need to be interpreted with caution since sample size may not be large enough to detect differences if they exist or differences may be identified when there are none in reality. However, major differences in results between different groups should be looked into and warrant an in-depth investigation following the SENS survey to try to understand if the difference is real and if it is, why there is a difference and what can be done about it.
- GAM and SAM prevalence results from year to year should be presented as shown in the example figure below.

**FIGURE 6** PREVALENCE OF GLOBAL AND SEVERE ACUTE MALNUTRITION BASED ON WHO GROWTH STANDARDS IN CHILDREN 6-59 MONTHS FROM 2015-2018. **NOTE THAT A TREND CAN ONLY BE IDENTIFIED WHEN THERE ARE AT LEAST THREE TIME POINTS. IT IS ADVISED THAT PREVALENCE DATA BE OBTAINED FROM SENS SURVEYS CARRIED OUT AT SIMILAR TIMES OF THE YEAR (THIS FIGURE CAN BE AUTOMATICALLY GENERATED BY USING SENS PRE-MODULE TOOL 17- TRENDS AND GRAPHS)**



**Things to watch out for:**

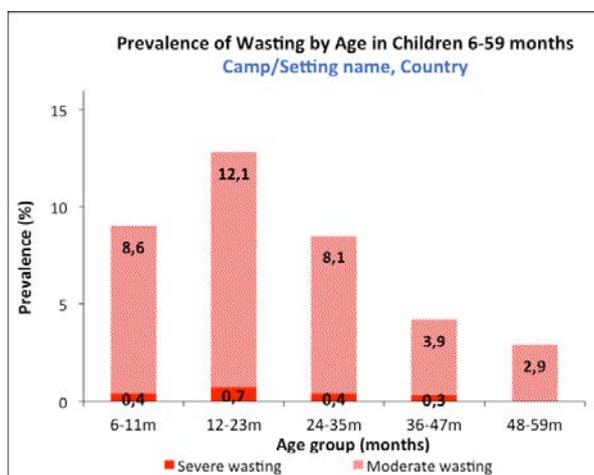
- In refugee camp settings, there can be large population movements in and out of the camps. These should not be ignored when interpreting change (or absence of change) in indicators over time.
- When the surveyed population is not stable and varies in number and / or composition over time, a lack of change in a specific indicator (e.g. GAM, stunting) is not necessarily due to a lack of effect of the interventions implemented in a refugee camp.
- Contact UNHCR HQ / Regional offices for support on how to interpret trends<sup>1</sup>.

**TABLE 17** PREVALENCE OF ACUTE MALNUTRITION BY AGE, BASED ON WEIGHT-FOR-HEIGHT Z-SCORES AND/OR OEDEMA (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

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.	%
6-11									
12-23									
24-35									
36-47									
48-59									
<b>Total</b>									

- Wasting prevalence trend by age shown in **Table 17** should also be presented in a figure as shown in the example below.

**FIGURE 7** PREVALENCE OF WASTING BY AGE IN CHILDREN 6-59 MONTHS (THIS FIGURE CAN BE AUTOMATICALLY GENERATED BY USING SENS PRE-MODULE TOOL 17- TRENDS AND GRAPHS)

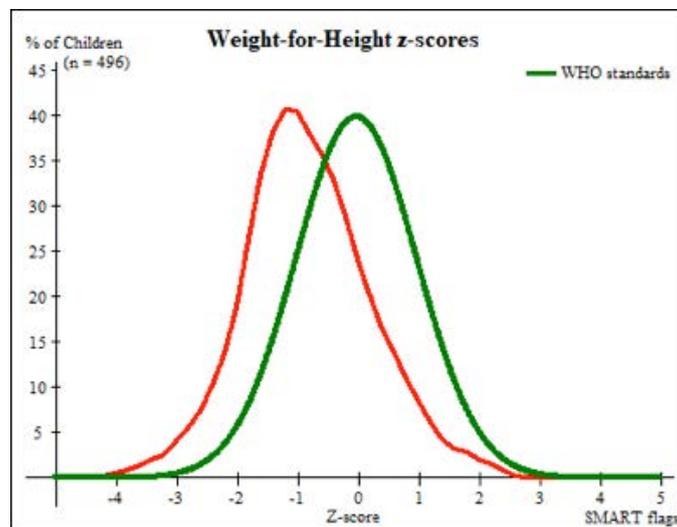


<sup>1</sup> Monitoring and evaluation of programmes in unstable populations: Experiences with the UNHCR Global SENS Database <https://www.enonline.net/fex/57/unhcrglobalsensdatabase>

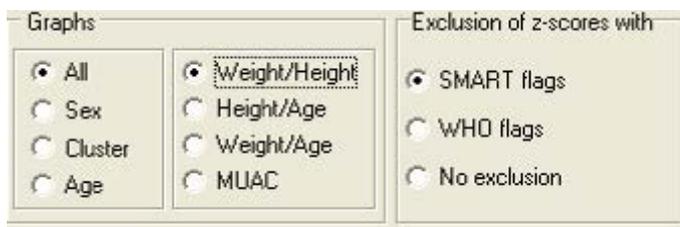
**Things to watch out for:**

- It is very common to see higher levels of wasting amongst children in the first two age groups, 6-11m and 12-23m. It might be tempting to focus on these groups (which are often linked to vulnerability and programmatic priorities) and present prevalence for the children 6-23 months separately. Note however that this is not good practice and is not recommended. The prevalence estimates are likely to be imprecise since sample size is calculated for all children 6-59m.

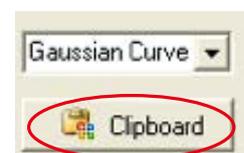
**FIGURE 8** DISTRIBUTION OF WEIGHT-FOR-HEIGHT Z-SCORES (BASED ON WHO GROWTH STANDARDS; THE REFERENCE POPULATION IS SHOWN IN GREEN AND THE SURVEYED POPULATION IS SHOWN IN RED) OF SURVEY POPULATION COMPARED TO REFERENCE POPULATION (THIS FIGURE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)



- This Gaussian Curve figure is generated automatically by ENA for SMART software in the Results Anthropometry screen and can be copied by clicking on the following buttons and icon:



and pasting it directly into the Word Report.



**TABLE 18** PREVALENCE OF MUAC MALNUTRITION (THESE RESULTS ARE AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE HOWEVER YOU NEED TO CHANGE THE TEXT DESCRIPTIONS ACCORDING TO UNHCR'S DEFINITIONS AS SHOWN BELOW)

	All n =	Boys n =	Girls n =
Prevalence of MUAC < 125 mm and/or oedema	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of MUAC < 125 mm and ≥ 115 mm, no oedema	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence MUAC < 115 mm and/or oedema	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)

**TABLE 19** PREVALENCE OF MUAC MALNUTRITION BY AGE, BASED ON MUAC CUT OFF'S AND/OR OEDEMA (THESE RESULTS ARE AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE HOWEVER YOU NEED TO CHANGE THE TEXT DESCRIPTIONS ACCORDING TO UNHCR'S DEFINITIONS AS SHOWN BELOW)

Age (mo)	Total no.	MUAC < 115 mm		MUAC ≥ 115 mm and < 125 mm		MUAC ≥ 125 mm		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-11									
12-23									
24-35									
36-47									
48-59									
<b>Total</b>									

**TABLE 20** PREVALENCE OF UNDERWEIGHT BASED ON WEIGHT-FOR-AGE Z-SCORES BY SEX (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

	All n =	Boys n =	Girls n =
Prevalence of underweight (<-2 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of moderate underweight (<-2 z-score and ≥-3 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of severe underweight (<-3 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)

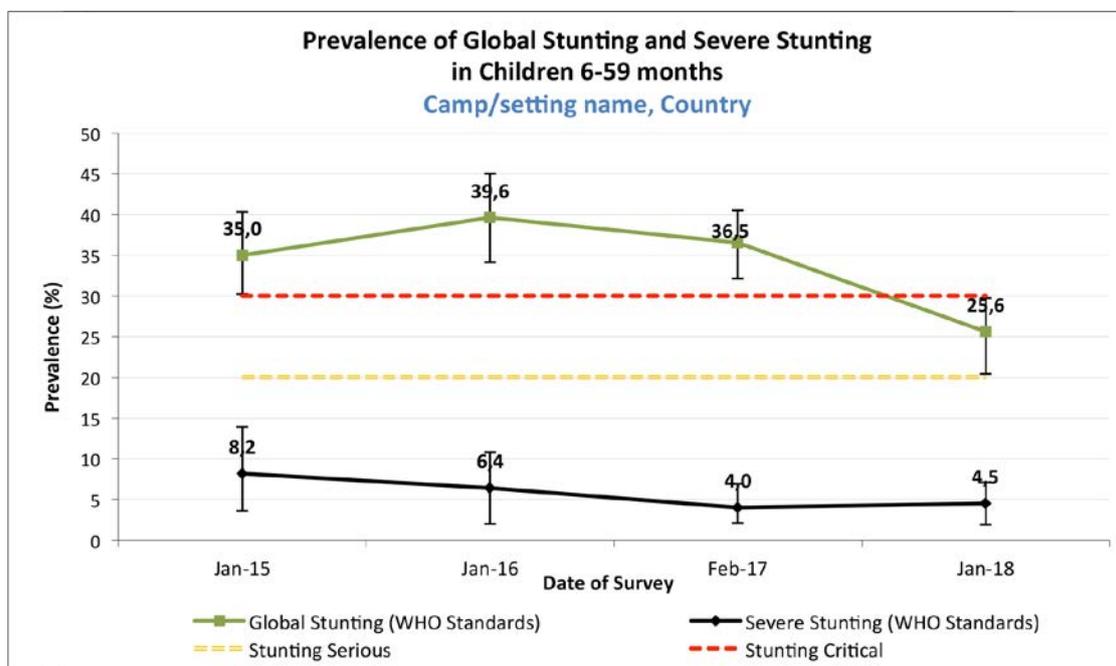
**TABLE 21** PREVALENCE OF UNDERWEIGHT BY AGE BASED ON WEIGHT-FOR-AGE Z-SCORES (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (≥ -3 and <-2 z-score)		Normal (≥ -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-11									
12-23									
24-35									
36-47									
48-59									
<b>Total</b>									

**TABLE 22** PREVALENCE OF STUNTING BASED ON HEIGHT-FOR-AGE Z-SCORES AND BY SEX (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

	All n =	Boys n =	Girls n =
Prevalence of stunting (<-2 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of moderate stunting (<-2 z-score and ≥-3 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of severe stunting (<-3 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)

**FIGURE 9** PREVALENCE OF GLOBAL AND SEVERE STUNTING BASED ON WHO GROWTH STANDARDS IN CHILDREN 6-59 MONTHS FROM 2015-2018. **NOTE THAT A TREND CAN ONLY BE IDENTIFIED WHEN THERE ARE AT LEAST THREE TIME POINTS. IT IS ADVISED THAT PREVALENCE DATA ARE OBTAINED FROM SENS SURVEYS CARRIED OUT AT SIMILAR TIMES OF THE YEAR (THIS FIGURE CAN BE AUTOMATICALLY GENERATED BY USING SENS PRE-MODULE TOOL 17- TRENDS AND GRAPHS)**



**Things to watch out for:**

- In refugee camp settings, there can be large population movements in and out of the camps. These should not be ignored when interpreting change (or absence of change) in indicators over time.
- When the surveyed population is not stable and varies in number and / or composition over time, a lack of change in a specific indicator (e.g. GAM, stunting) is not necessarily due to a lack of effect of the interventions implemented in a refugee camp.
- Contact UNHCR HQ / Regional offices for support on how to interpret trends<sup>2</sup>.

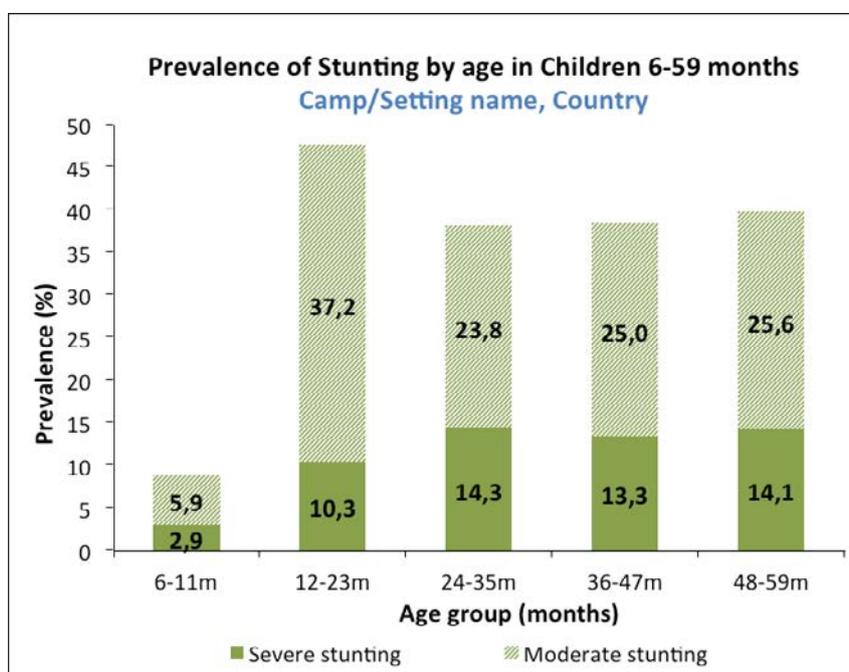
<sup>2</sup> Monitoring and evaluation of programmes in unstable populations: Experiences with the UNHCR Global SENS Database <https://www.enonline.net/fex/57/unhcrglobalsensdatabase>

**TABLE 23** PREVALENCE OF STUNTING BY AGE BASED ON HEIGHT-FOR-AGE Z-SCORES (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

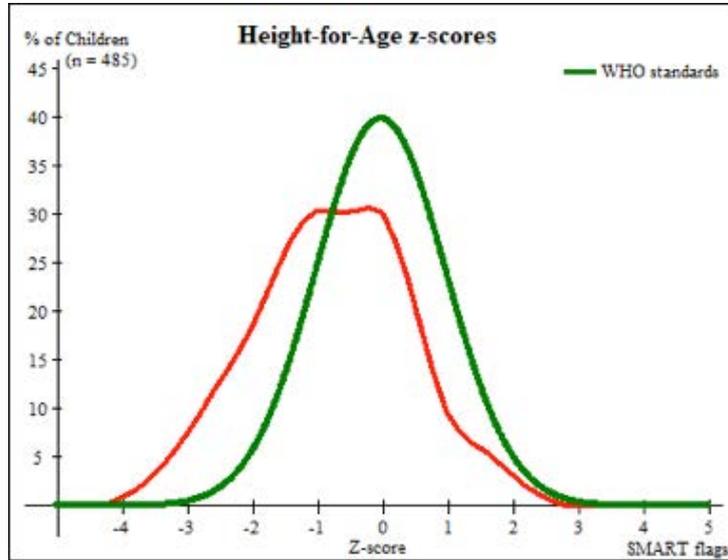
Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (≥ -3 and <-2 z-score)		Normal (≥ -2 z score)	
		No.	%	No.	%	No.	%
6-11							
12-23							
24-35							
36-47							
48-59							
<b>Total</b>							

- Stunting prevalence trend by age shown in **Table 23** should also be presented in a figure as shown in the example below.

**FIGURE 10** PREVALENCE OF STUNTING BY AGE IN CHILDREN 6-59 MONTHS (THIS FIGURE CAN BE AUTOMATICALLY GENERATED BY USING SENS PRE-MODULE TOOL 17- TRENDS AND GRAPHS)



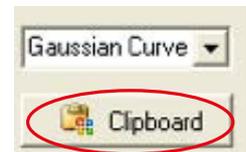
**FIGURE 11** DISTRIBUTION OF HEIGHT-FOR-AGE Z-SCORES (BASED ON WHO GROWTH STANDARDS; THE REFERENCE POPULATION IS SHOWN IN GREEN AND THE SURVEYED POPULATION IS SHOWN IN RED) OF SURVEY POPULATION COMPARED TO REFERENCE POPULATION (THIS FIGURE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)



- This Gaussian Curve figure is generated automatically by ENA for SMART software in the Results Anthropometry screen and can be copied by clicking on the following buttons and icon:

<b>Graphs</b> <input checked="" type="radio"/> All <input type="radio"/> Sex <input type="radio"/> Cluster <input type="radio"/> Age <input type="radio"/> Weight/Height <input checked="" type="radio"/> Height/Age <input type="radio"/> Weight/Age <input type="radio"/> MUAC		<b>Exclusion of z-scores with</b> <input checked="" type="radio"/> SMART flags <input type="radio"/> WHO flags <input type="radio"/> No exclusion
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	------------------------------------------------------------------------------------------------------------------------------------------------------------

and pasting it directly into the Word Report.



**TABLE 24** PREVALENCE OF OVERWEIGHT BASED ON WEIGHT-FOR-HEIGHT CUT OFF'S AND BY SEX (NO OEDEMA) (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

	All n =	Boys n =	Girls n =
Prevalence of overweight (WHZ > 2 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of severe overweight (WHZ > 3 z-score)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)

**TABLE 25** PREVALENCE OF OVERWEIGHT BY AGE, BASED ON WEIGHT-FOR-HEIGHT (NO OEDEMA) (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE)

Age (mo)	Total no.	Overweight (WHZ > 2 z-score)		Severe Overweight (WHZ > 3 z-score)	
		No.	%	No.	%
6-11					
12-23					
24-35					
36-47					
48-59					
<b>Total</b>					

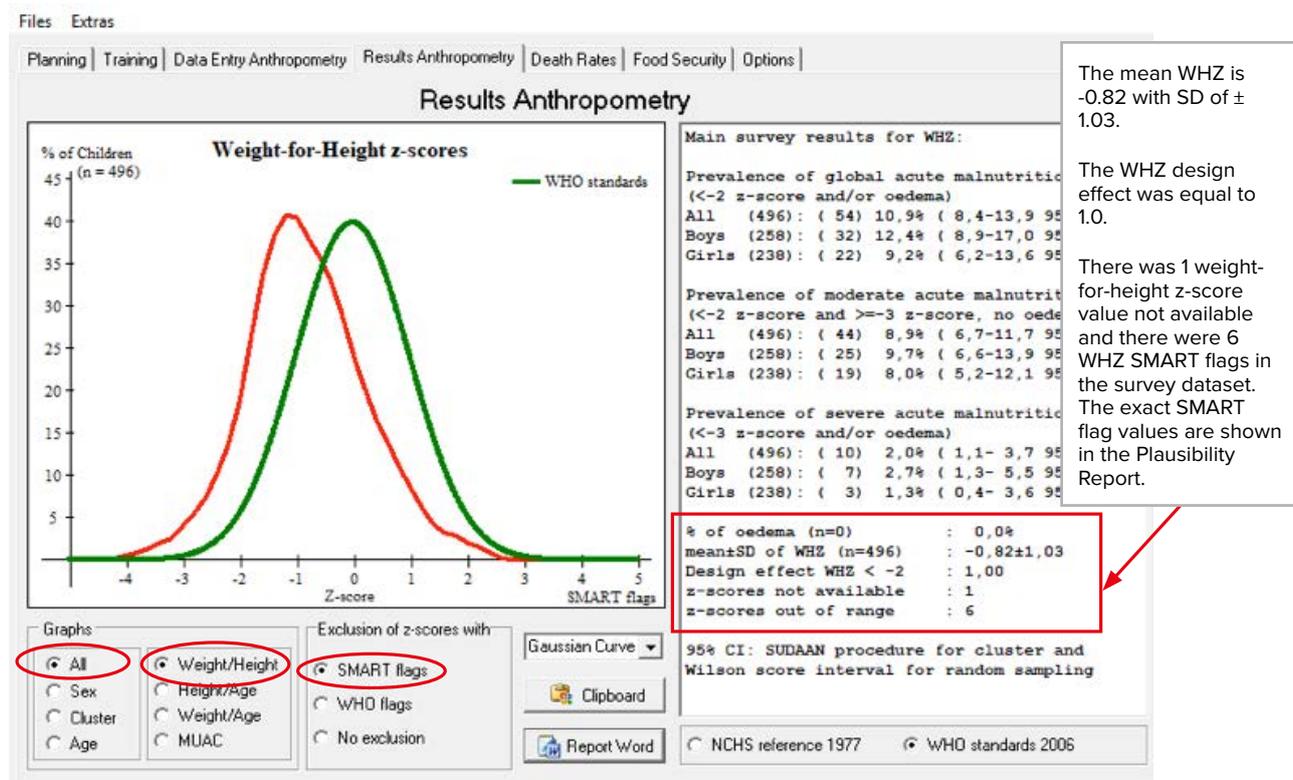
**TABLE 26** MEAN Z-SCORES, DESIGN EFFECTS AND EXCLUDED SUBJECTS (THIS TABLE IS AUTOMATICALLY GENERATED BY ENA FOR SMART SOFTWARE; NO DESIGN EFFECT SHOULD BE PRESENTED IF SIMPLE OR SYSTEMATIC RANDOM SAMPLING WAS USED)

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height		mean±SD of WHZ			
Weight-for-Age		mean±SD of WAZ			
Height-for-Age		mean±SD of HAZ			

\* contains the children with oedema for WHZ and WAZ.

- The flagging criteria used for anthropometric indices should be added to analysis section of the final report. (e.g. SMART flags and ranges used like -/+3 from the observed mean).
- The numbers shown in **Table 26** above can also be seen on the Results screen of ENA for SMART as indicated in the Figure below.

**FIGURE 12** MEAN Z-SCORES, DESIGN EFFECTS AND EXCLUDED SUBJECTS BY ENA FOR SMART



**Enrolment into nutrition programmes**

**TABLE 27** PROGRAMME ENROLMENT FOR ACUTELY MALNOURISHED CHILDREN

	Number/total	% (95% CI)
<b>Supplementary feeding programme (TSFP) enrolment</b>		
<b>Therapeutic (OTP/SC) feeding programme enrolment</b>		

- It is calculated based on the admission criteria used in the survey setting. Where admission is based on MUAC, WHZ and / or oedema, you may show two tables of results, one table showing the programme enrolment based on MUAC and / or oedema only, and one table showing the programme enrolment based on all three admission criteria.
- Children with WHZ flags should be excluded from the enrolment analysis.

**TABLE 28** COVERAGE OF THE BLANKET SUPPLEMENTARY FEEDING PROGRAMME (IF APPLICABLE)

	Number/total	% (95% CI)
<b>Blanket supplementary feeding programme coverage</b>		
<b>Product name</b>	_____	
<b>Target age group</b>	_____	

**Measles vaccination coverage**

**TABLE 29** MEASLES VACCINATION COVERAGE FOR CHILDREN AGED 9-59 MONTHS (OR OTHER CONTEXT-SPECIFIC TARGET GROUP)

	Number/total	% (95% CI)
<b>Measles vaccination with card</b>		
<b>Measles vaccination with card <u>or</u> confirmation from mother</b>		

**Vitamin A supplementation coverage**

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

	Number/total	% (95% CI)
<b>Vitamin A supplementation in the last 6 months with card</b>		
<b>Vitamin A supplementation in the last 6 months with card <u>or</u> confirmation from mother</b>		

**Deworming coverage (If applicable)**

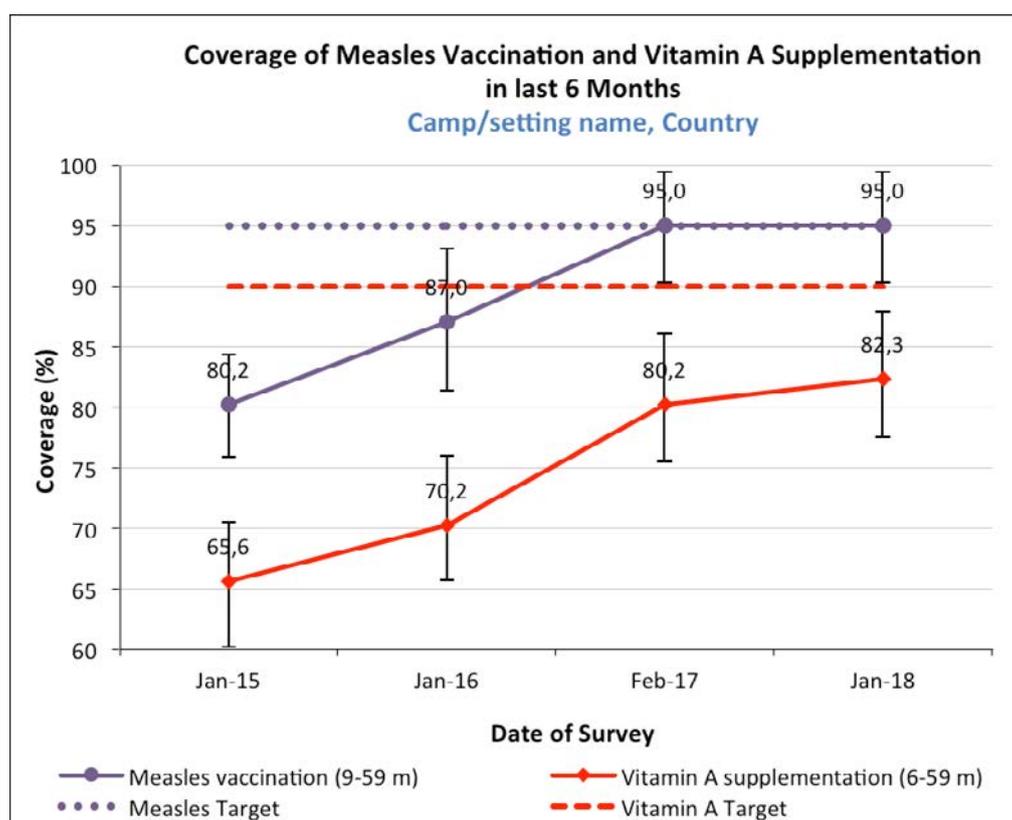
**TABLE 31 DEWORMING COVERAGE FOR CHILDREN AGED 12-59/24-59 MONTHS WITHIN THE PAST 6 MONTHS (OR OTHER CONTEXT-SPECIFIC TARGET GROUP)\* (IF APPLICABLE)**

	Number/total	% (95% CI)
<b>Deworming within the past 6 months</b>		

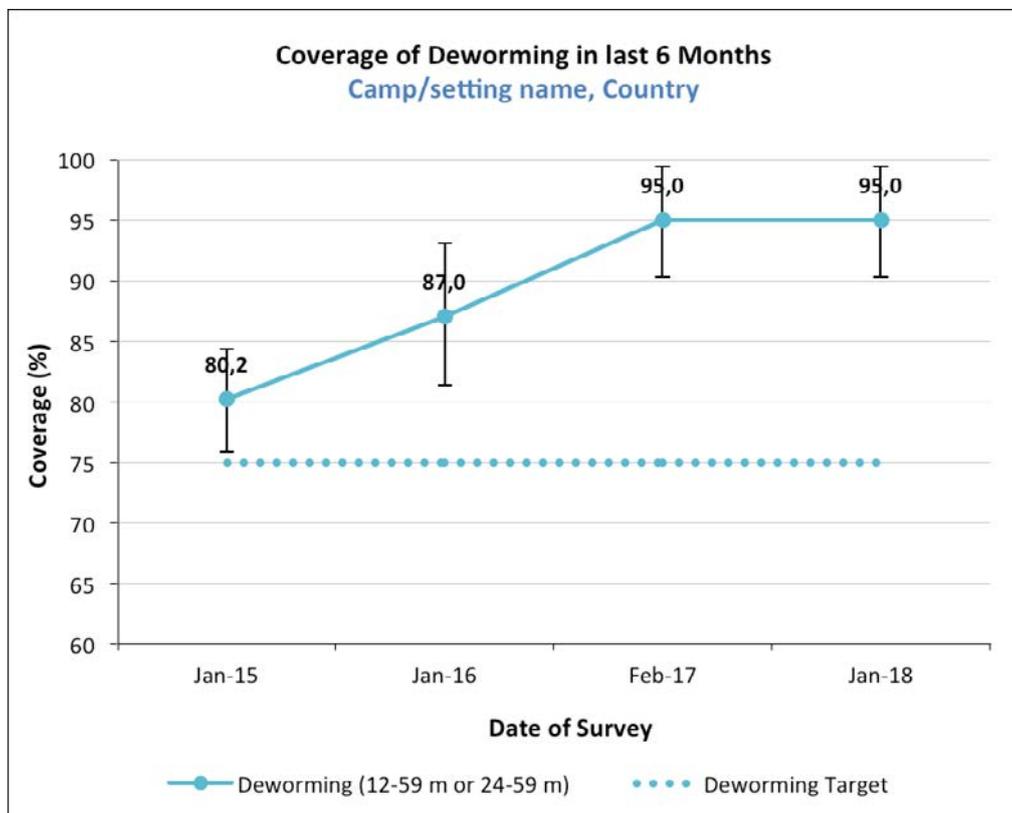
\*Note that this refers to large-scale campaigns done with mebendazole and/or albendazole. To be included only if deworming campaign has been done alongside a vaccination or vitamin A campaign in the last six months.

- Coverage results for measles, vitamin A supplementation in last 6 months and deworming in last 6 months from year to year should be presented as shown in the example figures below.

**FIGURE 13 COVERAGE OF MEASLES VACCINATION, AND VITAMIN A SUPPLEMENTATION IN LAST 6 MONTHS IN CHILDREN 6-59 MONTHS FROM 2015-2018. NOTE THAT A TREND CAN ONLY BE IDENTIFIED WHEN THERE ARE AT LEAST THREE TIME POINTS (THIS FIGURE CAN BE AUTOMATICALLY GENERATED BY USING SENS PRE-MODULE TOOL 17- TRENDS AND GRAPHS)**



**FIGURE 14** COVERAGE OF DEWORMING IN LAST 6 MONTHS IN CHILDREN 12-59/24-59 MONTHS FROM 2015-2018. **NOTE THAT A TREND CAN ONLY BE IDENTIFIED WHEN THERE ARE AT LEAST THREE TIME POINTS** (THIS FIGURE CAN BE AUTOMATICALLY GENERATED BY USING SENS PRE-MODULE TOOL 17-TRENDS AND GRAPHS)



**Diarrhoea**

**TABLE 32** PERIOD PREVALENCE OF DIARRHOEA

	Number/total	% (95% CI)
Diarrhoea in the last two weeks		

**TABLE 33** ORS AND ZINC USE DURING DIARRHOEA EPISODE (OPTIONAL)

	Number/total	% (95% CI)
ORS use during diarrhoea episode		
Zinc tablet or syrup use during diarrhoea episode		

**Women 15-49 years (optional)**

**TABLE 34** WOMEN PHYSIOLOGICAL STATUS AND AGE (OPTIONAL)

Physiological status	Number/total	% of sample
Non-pregnant, non-lactating		
Pregnant		
Lactating with an infant less than 6 months		
Lactating with an infant greater than 6 months		
Mean age in years [min, max] (all women)		

**MUAC in women (optional)**

**TABLE 35** PREVALENCE OF MUAC MALNUTRITION IN NON-PREGNANT, NON-LACTATING WOMEN (ADAPT THE CUT-OFFS TO THE CONTEXT) (OPTIONAL – ONLY IF THERE ARE PARTICULAR CONCERNS ABOUT NUTRITION STATUS OF WOMEN)

	Number/total	% (95% CI)
Prevalence of MUAC < [INSERT VALUE] mm		

**TABLE 36** PREVALENCE OF MUAC MALNUTRITION IN PREGNANT WOMEN AND LACTATING WOMEN WITH AN INFANT LESS THAN 6 MONTHS (ADAPT THE CUT-OFFS TO THE CONTEXT) (OPTIONAL)

	Number/total	% (95% CI)
Prevalence of MUAC < [INSERT VALUE] mm		

**BSFP enrolment (if applicable)**

**TABLE 37** COVERAGE OF THE BLANKET SUPPLEMENTARY FEEDING PROGRAMME (IF APPLICABLE)

	Number/total	% (95% CI)
Blanket feeding programme enrolment		
Product name		
Target group		

# Data analysis

## Analysis procedures

- Make sure that the data has been reviewed before starting the analysis process.
- See SENS Pre-module tool: [**Tool 15**- Standard Operating Procedure (SOP) for SENS data management] for guidance on how to transfer the data from the csv data files produced by the smartphones to ENA when conducting an MDC SENS survey.



### *Children anthropometric data (age, sex, weight, height/length, oedema, MUAC)*

- Use ENA for SMART software to perform an automated, standard analysis of the anthropometric data using WHO Growth Standards 2006 to fill out **Tables 13-26**.
- Case definitions and calculations shown in **Tables 1-5** should be used and shown in the final report.
- Refer to **SMART initiative documentation** for detailed guidance (see SMART references section).

### Additional variables

- For some of the additional analyses, the ENA for SMART statistical calculator may be used. Refer to **SMART initiative documentation** for detailed guidance.
- Brief guidance on using Epi Info software for analysis is provided below for the additional variables not automatically analysed by ENA for SMART. Refer to **Annex 9** for standard analysis commands using Epi Info 7. Free guidance on the use of Epi Info for Windows and training material on Epi Info can be found at the following site: <http://www.cdc.gov/EpiInfo>

### *Time of arrival*

- **Only use this variable if it is really necessary in your context and if it can be used for interpreting findings or for useful programming decisions.** There are risks in meaningfulness of data the more data is disaggregated.
- Define and recode a new variable for various time frames, e.g. CHARRIVE\_c.
- If survey design was simple random sampling, use Epi Info 'Frequencies' command to fill out **Table 15**.
- If the survey design was cluster sampling, use Epi Info 'Complex Sample Frequencies' command (PSU is the CLUSTER variable) to fill out **Table 15**.
- If justified and deemed appropriate with the support from UNHCR HQ / Regional Offices, these newly defined variables might be used to disaggregate some of the anthropometric results.

***Measles vaccination and vitamin A supplementation***

- Define and recode a new variable for measles vaccination and vitamin A supplementation with card or confirmation from mother, e.g. MSL\_cc and VITA\_cc (card or confirmation), respectively.
- Use the 'Select' command in Epi Info to proceed with analysis of children aged 9-59 months. e.g.:  
Select age group equal to '9-59.99'.
- If survey design was simple random sampling, use Epi Info 'Frequencies' command to fill out **Tables 29-30**.
- If the survey design was cluster sampling, use Epi Info 'Complex Sample Frequencies' command (PSU is the CLUSTER variable) to fill out **Tables 29-30**.

***Diarrhoea and use of ORS and zinc***

- Exclude from analysis children with answers '8' ('don't know').
- If the survey design was simple or systematic random sampling, use Epi Info 'Frequencies' command to fill out **Tables 32-33**.
- If the survey design was cluster sampling, use Epi Info 'Complex Sample Frequencies' command (PSU is the CLUSTER variable) to fill out **Tables 32-33**.

***Deworming***

- Exclude from analysis children with answer '8' ('don't know').
- If the survey design was simple or systematic random sampling, use Epi Info 'Frequencies' command to fill out **Table 31**.
- If the survey design was cluster sampling, use Epi Info 'Complex Sample Frequencies' command (PSU is the CLUSTER variable) to fill out **Table 31**.

***Nutrition Programme Enrolment***

- Note that enrolment to nutrition programmes for acutely malnourished children may be based on more than one admission criteria, e.g. weight-for-height, MUAC and / or oedema. In this case, define a new variable for eligibility to the targeted supplementary feeding programme (TSFP) and one for eligibility to the therapeutic feeding programme (OTP/SC) for calculating child eligibility according to the context-specific admission criteria, e.g. SFPE for a child who is eligible for the targeted supplementary feeding programme and TFPE for a child who is eligible for the therapeutic feeding programme.
- Note that age eligibility for admission to blanket feeding programmes will vary depending on the context. Ensure to analyse this variable in the target age group used in the survey area.

- Then, proceed to calculating enrolment following the calculation previously mentioned and analyse using the procedure described in **Annex 9**.

**Physiological status and MUAC in women**

- Define and recode new variables for women physiological status and MUAC categories, e.g. NOPLW/PLW and LOWWMUAC respectively.
- If the survey design was simple or systematic random sampling, use Epi Info ‘Frequencies’ command to fill out **Tables 34-37**.
- If the survey design was cluster sampling, use Epi Info ‘Complex Sample Frequencies’ command (PSU is the CLUSTER variable) to fill out **Tables 34-37**.

### Common errors and challenges in data analysis

**Table 38** describes the most common errors experienced by survey managers when conducting the final data analysis.

**TABLE 38 COMMON ERRORS EXPERIENCED IN DATA ANALYSIS**

Common errors	Examples	Solution
<b>Oedema not measured and/or not correctly taken into account in calculation of malnutrition prevalence</b>	Reporting global acute malnutrition prevalence by only including wasted children (weight-for-height z-score < -2).	Always measure oedema and ensure that oedematous children are correctly included in calculation of the prevalence of malnutrition.
<b>Not taking into consideration a weighting factor when combining malnutrition prevalence estimates from several camps</b>	When surveying several camps with a representative sample drawn from each camp, combining the samples from all camps to calculate the overall prevalence without taking into consideration a weighting factor.	For a tool that will automatically generate weighed prevalence results, see SENS Pre-Module tool: <b>[Tool 21-Weighting Data Tool]</b> .
<b>Reporting malnutrition results according to certain aggregates of clusters</b>	Reporting the malnutrition results per groups of cluster or per camp section / block.	Do not disaggregate cluster surveys according to clusters in the presentation of results. All clusters merged together from all section / blocks of the camp are representative of the camp as a whole and should not be disaggregated.
<b>Reporting a change in the malnutrition situation without any evaluation of whether the observed change is statistically significant or real</b>	Using the point estimate results of two surveys (e.g. 10.1% vs. 12.5%) and concluding that there has been a change in GAM prevalence without looking at the confidence intervals or conducting a statistical test.	Assess whether the confidence intervals overlap and conduct a statistical test using the CDC IERHB calculator. See SENS Pre-Module tool: <b>[Tool 18- CDC Calculator two surveys]</b> .
<b>Not reporting confidence intervals around the measles vaccination, vitamin A supplementation and deworming coverage estimates, or diarrhoea results</b>	Only reporting the point estimates in the final report. Often, this is because the procedure for the analysis function that takes into account cluster sampling to adjust for confidence intervals is not known by the user.	If cluster sampling is used, use the Complex Sample module in Epi Info (Advanced statistics) for analysis of measles vaccination, vitamin A supplementation and diarrhoea results.



# Use of results

## Classification of public health problem and targets

### Anthropometric data

**TABLE 39** UNHCR TARGETS FOR GAM AND SAM PREVALENCE

Indicator	Target	Source
GAM Prevalence (6-59m)	<10%	UNHCR
SAM Prevalence (6-59m)	<2%	UNHCR

- The targets above refer only to WHZ. MUAC is also used as an independent criteria for admission of acutely malnourished children but prevalence of GAM is interpreted through WHZ and oedema. MUAC and WHZ do not necessarily identify the same children although there will probably be some overlap where children have both low MUAC and low WHZ, there will be others that have low MUAC only or low WHZ only. Often there will be more children identified with WHZ than by MUAC.
- Table 40 shows the WHO-UNICEF Classification of public health significance of the anthropometric results for children under-5 years of age.

**TABLE 40** WHO-UNICEF (2018) CLASSIFICATION OF PUBLIC HEALTH SIGNIFICANCE FOR CHILDREN UNDER 5 YEARS OF AGE<sup>3</sup>

Classification Prevalence thresholds (%)	Critical situation	Serious situation	Poor situation	Acceptable situation	
	Very High	High	Medium	Low	Very low
Wasting	≥ 15	10 - < 15	5 - < 10	2.5 - < 5	< 2.5
Stunting	≥ 30	20 - < 30	10 - < 20	2.5 - < 10	< 2.5
Overweight	≥ 15	10 - < 15	5 - < 10	2.5 - < 5	< 2.5
Underweight*	≥ 30	20 - < 30	10 - < 20	< 10%	

\* Source: WHO (1995). [Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. Technical Report Series No. 854. Geneva, World Health Organization, 1995.](#)

<sup>3</sup> WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring (TEAM) recommendations August 2018.

**Things to watch out for:**

- Although the use of this classification system is useful for decision makers, the thresholds should be interpreted with caution and in context.
- A poor or an acceptable situation does not mean that there is no need for intervention, the population size is also an important factor in determining whether services are required e.g. A refugee population of 300 000 with a GAM prevalence of 4% will have approximately 2400 children who require treatment at any one time. Conversely, the number of children requiring treatment in a refugee situation with 20 000 people and a 20% GAM prevalence would be 800.
- A single prevalence figure does not inform whether the malnutrition is increasing, is stable or is decreasing. It is important to look at trends as well as the current survey prevalence e.g. if a survey falls into the poor category at 8% GAM, but has increased from 3.5%, this may indicate a deteriorating situation and the need for intervention at varying levels. A trend can only be established where there are at least three points of data.
- The classification refers to wasting and does not technically include oedema. Comparison of the GAM (including oedema) against the classification thresholds is often done. Care must be taken in the interpretation of this.
- If any aggravating factors exist (e.g. including but not limited to high morbidity rates, measles outbreak, poor health or sanitation infrastructure, fragile access or availability of food, poor or deteriorating infant feeding practices), consider that the situation may be more serious.

**Nutrition programme enrolment**

- Note that nutrition programme enrolment for acutely malnourished children results are not as precise as results of a coverage survey due to the much smaller sample size of malnourished children. **Table 41** shows the performance indicators for malnutrition treatment programmes according to Sphere Standards.

**TABLE 41 PERFORMANCE INDICATORS FOR MAM AND SAM (SPHERE)**

Coverage		
Rural areas	Urban areas	Camps
>50%	>70%	>90%

- The target for blanket feeding programme coverage should be >70%<sup>4</sup>.

4 UNHCR (2011) Operational Guidance on the Use of Special Nutritional Products to Reduce Micronutrient Deficiencies and Malnutrition in Refugee Populations <http://www.unhcr.org/publications/operations/4f1fc3de9/unhcr-operational-guidance-use-special-nutritional-products-reduce-micronutrient.html>  
WFP 2017-2021 Corporate results framework outcome and output indicator compendium, March 2018 Update.

**Coverage of measles vaccination, vitamin A supplementation and deworming in last 6 months**

**TABLE 42 UNHCR TARGETS FOR MEASLES VACCINATION, VITAMIN A SUPPLEMENTATION AND DEWORMING COVERAGE**

Indicator	Target coverage	Source
Measles vaccination coverage (9-59 mois)	95%	UNHCR, Sphere Standards
Vitamine A supplementation in the last 6 months coverage (6-59m)	>90%	UNHCR
Deworming in the last 6 months coverage (appropriate age group)	75%	WHO

**Diarrhoea**

- The diarrhoea results from the survey should not be *directly* compared to the data on diarrhoea from Health Information System (HIS) since HIS data is the clinic based data whereas the survey results are household-based data.

**Recommendations**

- The anthropometric, nutrition programme enrolment, measles vaccination, vitamin A supplementation, deworming and diarrhoea assessment results are to assist public health partners working in refugee settings to better plan their nutrition programming. For example, the results can assist in:
  - Improving the provision of food assistance and / or implementing blanket feeding programmes;
  - Improving the nutrition treatment programmes and screening at the community level;
  - Improving measles, vitamin A and/or deworming campaigns or programmes;
  - Improving supply and retention of health record cards, and enhancing the recording of key information;
  - Strengthening training of health staff in nutrition programmes;
  - Implementing Behaviour Change and Communication activities on prevention of malnutrition.

# SMART initiative documentation references

## SMART Survey Planning Tools

Components of the Survey Planning Tools:

### 1. The SMART Methodology Manual

#### **SMART (2006). *Measuring Mortality, Nutritional Status, and Food Security in Crisis Situations - SMART Methodology version 1 April 2006***

- A manual detailing a basic integrated method for assessing nutritional status and mortality rate in emergency situations. It includes details of how to use the ENA Software for analysing data. The manual is aimed at host government partners and humanitarian organisations as part of the SMART initiative enhancing capacity and draws from core elements of several existing methods and best practice.
- Link: <http://smartmethodology.org/survey-planning-tools/smart-methodology/smart-methodology-manual/>

### 2. SMART Capacity Building Toolbox

#### **SMART (2014). *Enumerator Training Package***

- The Enumerator Training Package offers a set of materials specifically designed for Enumerator-level training (individuals who are collecting the data in the field). It is possible to download the whole package or to download only specific modules
- Package includes:
  - Enumerator Training Manual (PDF)
  - Module 1 - SMART Overview and Survey Teams (PPT, PDF)
  - Module 2 - Questionnaire and Event Calendar (PPT, PDF, online video complement)
  - Module 3 - Anthropometry and Malnutrition (PPT, PDF, online video complements)
  - Module 4 - Quality Checks (PPT, PDF)
  - Module 5 - Sampling Methods (PPT, PDF)
  - Module 6 - Mortality Questionnaire (PPT, PDF, online video complement)
- Availability: Free (various formats), English, French and Spanish (videos in English only)
- Links:
  - EN: <http://smartmethodology.org/survey-planning-tools/smart-capacity-building-toolbox/>
  - FR: <http://smartmethodology.org/survey-planning-tools/kit-de-formation-smart/>
  - SP: <http://smartmethodology.org/survey-planning-tools/herramientas-para-smart/>

**SMART (2014). Survey Manager Training Package**

- The Survey Manager Training Package offers a set of materials for Survey Manager-level training (individuals who will be planning, supervising, analyzing and report writing of the survey data). It is possible to download the whole package or to download only specific modules/tools.
- Package includes:
  - Survey Manager Training Manual (PDF).
  - Survey Manager Modules and Presentations:
    - ◆ Module 1 - Overview of Nutrition and Mortality Surveys (PPT, PDF)
    - ◆ Module 2 - Survey Teams (PPT, PDF, online video complement)
    - ◆ Module 3 – Sampling (PPT, PDF)
    - ◆ Module 4 - Survey Field Procedures (PPT, PDF)
    - ◆ Module 5 – Anthropometry (PPT, PDF, online video complements)
    - ◆ Module 6 - Standardisation Test (PPT, PDF, online video complement)
    - ◆ Module 7 - Plausibility Check for Anthropometry (PPT, PDF)
    - ◆ Module 8 – Mortality (PPT, PDF)
    - ◆ Module 9 - Interpretation of Results and Reporting (PPT, PDF)
    - ◆ Complementary Tools and Resources (include data exercises, software manuals, statistical calculators, required readings, facilitator resources and handouts) (PDF).
  - Annexes including practical resources for each module of the SMART Survey Manager curriculum (PDF).
- Availability: Free (various formats), English, French and Spanish (videos in English only).
- Links:
  - EN: <http://smartmethodology.org/survey-planning-tools/smart-capacity-building-toolbox/>
  - FR: <http://smartmethodology.org/survey-planning-tools/kit-de-formation-smart/>
  - SP: <http://smartmethodology.org/survey-planning-tools/herramientas-para-smart/>

### **SMART (2016). *E-Learning Series***

- The four modules based on the Enumerator curriculum include: *Module 1* - Overview of Field Surveys; *Module 2* - Survey Teams; *Module 3* - Questionnaire Design; and *Module 4* - Field Procedures. It is important to note that these e-learning modules are supplementary training material and are not in any way meant to replace the face-to-face platform for delivering the SMART methodology curriculum. The modules target both beginners and refresher participants.
- Availability: Free, access to modules via an individual [www.disasterready.org](http://www.disasterready.org) account, English.
- Link: <http://smartmethodology.org/survey-planning-tools/smart-capacity-building-toolbox/>

### **3. ENA Software**

#### **SMART (2011). *Emergency Nutrition Assessment (ENA) Software version July 9, 2015***

- A user-friendly analytical program recommended by SMART. It has automated functions for sample size calculations, sample selection, quality checks, standardization for anthropometry measurements, and report generation with automatic analyses. ENA is highly favoured by field practitioners; it facilitates survey planning, data collection, analysis and reporting with the ability to generate automatic standard tables and graphs for anthropometric indices and plausibility check reports.
- Includes ENA Software Manual (PDF).
- Availability: Free download (various formats), English.
- Link: <http://smartmethodology.org/survey-planning-tools/smart-emergency-nutrition-assessment/>

## SMART Methodology Resources

### **SMART (n.d.). *Interpreting SMART Results (CDC Calculator)***

- The CDC Statistical Calculators (in Excel format) are used to help interpret prevalence results from nutritional surveys, which are often expressed as an estimate with a confidence interval.
- Tools and instructions are offered for use with one or two surveys. Each Excel tool includes three sheets: two are for cluster surveys (depending whether design effect is known or not) and one is for simple or systematic random sampling. It is possible to download the whole package or to download only specific resources.
- Includes:
  - CDC Statistical Calculator – One Survey (XLS File)
  - Instructions for Calculator – One Survey (PDF)
  - CDC Statistical Calculator – Two Surveys (XLS File)
  - Instructions for Calculator – Two Surveys (PDF)
- Availability: Free Download (various formats), English and French.
- Link: <http://smartmethodology.org/survey-planning-tools/smart-methodology/>

### **SMART (2012). *Sampling Methods and Sample Size Calculation for the SMART Methodology***

- A complement document for individuals involved in nutrition survey sampling to better understand the sampling module of SMART.
- Availability: Free download (PDF), English and French.
- Link: <http://smartmethodology.org/survey-planning-tools/smart-methodology/>

### **SMART (2015). *SMART Plausibility Check for Anthropometry***

- The Plausibility Check is a key SMART innovation used to analyse the overall quality of anthropometric survey data. The document provides explanations on the logic behind the statistical tests used to analyse anthropometric data and a step-by-step approach on how to interpret the different sections of the Plausibility Check.
- Availability: Free download (PDF), English.
- Link: <http://smartmethodology.org/survey-planning-tools/smart-methodology/>

# ANNEXES



## Annex 1- Events calendar

See SENS Anthropometry and Health **Tool 1** for instructions on how to use the calendar.



Calendar of Events 2011-2016 – Interagency Nutrition Survey Amongst Syrian Refugees in Jordan Data Collection: September				
Season	Religious Holidays/National Holidays	Syrian Events	Month / Year	Age (month)
	Aïd Al Adha:11 <sup>th</sup>		September 2016	0
End of summer			August 2016	1
Summer	Aïd Al Fitr: 7 <sup>th</sup>		July 2016	2
Start of summer	Beginning of Ramadan: 7 <sup>th</sup>		June 2016	3
	Al Isra' wal Miraj: 4 <sup>th</sup>	Martyrs' day: 6 <sup>th</sup>	May 2016	4
		Independence day: 17 <sup>th</sup>	April 2016	5
	Mother's day: 21 <sup>st</sup> Easter day: 27 <sup>th</sup>	Revolution day: 8 <sup>th</sup>	March 2016	6
End of winter			February 2016	7
Winter	New year's day: 1 <sup>st</sup>		January 2016	8
Start of winter	Aïd Al Mawlid Annabawi: 24 <sup>th</sup> Christmas: 25 <sup>th</sup>		December 2015	9
			November 2015	10
	Muharram: 15 <sup>th</sup>		October 2015	11
	Aïd Al Adha:24 <sup>th</sup>		September 2015	12
End of summer			August 2015	13
Summer	Aïd Al Fitr: 18 <sup>th</sup>		July 2015	14
Start of summer	Beginning of Ramadan: 18 <sup>th</sup>		June 2015	15
	Al Isra' wal Miraj: 4 <sup>th</sup>	Martyrs' day: 6 <sup>th</sup>	May 2015	16
	Easter day: 5 <sup>th</sup>	Independence day: 17 <sup>th</sup>	April 2015	17
	Mother's day: 21 <sup>st</sup>	Revolution day: 8 <sup>th</sup>	March 2015	18
End of winter	Valentine's day: 14 <sup>th</sup>		February 2015	19
Winter	New year's day: 1 <sup>st</sup> Aïd Al Mawlid Annabawi: 3 <sup>th</sup>		January 2015	20
Start of winter	Christmas: 25 <sup>th</sup>		December 2014	21
			November 2014	22
	Aïd Al Adha:4 <sup>th</sup> Muharram: 25 <sup>th</sup>		October 2014	23
			September 2014	24
End of summer			August 2014	25
Summer	Aïd Al Fitr: 28 <sup>th</sup>		July 2014	26
Start of summer	Beginning of Ramadan: 29 <sup>th</sup>		June 2014	27
	Al Isra' wal Miraj: 26 <sup>th</sup>	Martyrs' day: 6 <sup>th</sup>	May 2014	28
	Easter: 20 <sup>th</sup>	Independence day: 17 <sup>th</sup>	April 2014	29
	Mother's day: 21 <sup>st</sup>	Revolution day: 8 <sup>th</sup>	March 2014	30
End of winter			February 2014	31
Winter	New year's day: 1 <sup>st</sup> Aïd Al Mawlid Annabawi: 13 <sup>th</sup>		January 2014	32
Start of winter	Christmas: 25 <sup>th</sup>		December 2013	33
	Muharram: 7 <sup>th</sup>		November 2013	34
	Aïd Al Adha:15 <sup>th</sup>		October 2013	35
			September 2013	36

Calendar of Events 2011-2016 – Interagency Nutrition Survey Amongst Syrian Refugees in Jordan Data Collection: September				
Season	Religious Holidays/National Holidays	Syrian Events	Month / Year	Age (month)
End of summer	Aïd Al Fitr: 8 <sup>th</sup>		August 2013	37
Summer	Beginning of Ramadan: 9 <sup>th</sup>		July 2013	38
Start of summer	Al Isra' wal Miraj: 5 <sup>th</sup>		June 2013	39
		Martyrs' day: 6 <sup>th</sup>	May 2013	40
		Independence day: 17 <sup>th</sup>	April 2013	41
	Mother's day: 21 <sup>st</sup> Easter day: 31 <sup>th</sup>	Revolution day: 8 <sup>th</sup>	March 2013	42
End of winter			February 2013	43
Winter	New year's day: 1 <sup>st</sup> Aïd Al Mawlid Annabawi: 24 <sup>th</sup>		January 2013	44
Start of winter	Christmas: 25 <sup>th</sup>		December 2012	45
	Muharram: 15 <sup>th</sup>		November 2012	46
	Aïd Al Adha: 25 <sup>th</sup>		October 2012	47
			September 2012	48
End of summer	Aïd Al Fitr: 19 <sup>th</sup>		August 2012	49
Summer	Beginning of Ramadan: 20 <sup>th</sup>		July 2012	50
Start of summer	Al Isra' wal Miraj: 17 <sup>th</sup>		June 2012	51
		Martyrs' day: 6 <sup>th</sup>	May 2012	52
	Easter day: 8 <sup>th</sup>	Independence day: 17 <sup>th</sup>	April 2012	53
	Mother's day: 8 <sup>th</sup>	Revolution day: 8 <sup>th</sup>	March 2012	54
End of winter	Aïd Al Mawlid Annabawi: 4 <sup>th</sup>		February 2012	55
Winter	New year's day: 1 <sup>st</sup>		January 2012	56
Start of winter	Christmas: 25 <sup>th</sup>		December 2011	57
	Aïd Al Adha: 7 <sup>th</sup> Muharram: 27 <sup>th</sup>		November 2011	58
			October 2011	59
			<b>September 2011</b>	<b>60</b>

## Annex 2- Ordering information

Refer to SENS Pre-Module **Tool 10** (Survey Supplies Planning Sheet) for more details on quantity to be ordered based on the number of teams included in the survey. 

Anthropometric Equipment may be ordered via the UNHCR Global Frame Agreements (FAs). Essential medicines and medical supplies lists as well as the processes for ordering can be found on the UNHCR Intranet: <https://intranet.unhcr.org/en/support-services/procurement-service/-procurement-of-medical-items.html>

Items can also be ordered with other suppliers below.

### Anthropometric equipment

UNICEF supply division (for electronic scales, MUAC tapes and wooden height measuring boards)

Oceanvej 10-12

2150 Copenhagen

Denmark

Tel: +45 45 33 55 00

Fax: +45 35 26 94 21

E-mail: [supply@unicef.org](mailto:supply@unicef.org)

Website: [www.unicef.org/supply](http://www.unicef.org/supply)

To order via UNICEF please contact the focal point at the nearest UNICEF Country Office for assistance

Weigh and Measure, LCC (*formerly Shorr Productions, LLC*)

(for electronic scales and wooden height measuring boards)

17802 Shotley Bridge Place

Olney, Maryland 20832-1671

USA

Tel: +1-301-774-9006

Fax: +1-301-774-0436

E-mail: [Info@WeighAndMeasure.com](mailto:Info@WeighAndMeasure.com)

Website: [www.weighandmeasure.com](http://www.weighandmeasure.com)

Health Books International (*formerly Teaching-aids at Low Cost (TALC)*)

(for child and adult MUAC tapes)

Barn B

New Barnes Mill

Cottonmill Lane

St Albans

Hertfordshire

AL1 2HA Tel: +44 1582 380883

Email: [help@healthbooksinternational.org](mailto:help@healthbooksinternational.org)

Website: [healthbooksinternational.org/product/long-insertion-tape](http://healthbooksinternational.org/product/long-insertion-tape)

or

[healthbooksinternational.org/product/mid-upper-arm-circumference-tape-muac-tape-measure-style](http://healthbooksinternational.org/product/mid-upper-arm-circumference-tape-muac-tape-measure-style)

### Annex 3- CHILD sens questionnaire

See SENS Pre-Module tools: [Tool 11-Full SENS questionnaire] and [Tool 12-Full SENS Questionnaire with Instructions].



No	QUESTION	ANSWER CODES	
<b>SECTION CHILD1: Details of the Child 0-59 months or 6-59 months</b>			
THIS SECTION IS TO BE ADMINISTERED TO ALL CHILDREN IN THE SELECTED HOUSEHOLDS BETWEEN 0-59 MONTHS OR 6-59 MONTHS: DEPENDING ON WHICH SENS MODULE IS INCLUDED.			
<b>Note</b>	THESE QUESTIONS NEED TO BE ASKED TO THE MOTHER OR THE MAIN CAREGIVER.		
<b>CH1</b>	ID Number  <b>ID</b>		<input type="checkbox"/>
<b>CH2</b>	Was consent given for conducting the interview and the measurements?  ENSURE THAT YOU HAVE INTRODUCED THE TEAM AND INFORMED THEM ABOUT THE INTERVIEW AND THE MEASUREMENTS.  <b>CHCONST</b>	Yes.....1 No.....2	<input type="checkbox"/> <b>IF ANSWER IS 2 STOP HERE</b>
<b>CH3</b>	Name of the child  ONLY WRITE FIRST NAME.  <b>CHNAME</b>	<input type="text"/>	
<b>CH4</b>	Sex of [NAME OF CHILD]?  <b>SEX</b>	Male .....m Female .....f	<input type="checkbox"/>
<b>CH5</b>	Do you have an official age documentation for [NAME OF CHILD]?  <b>XDOBK</b>	Yes.....1 No.....2	<input type="checkbox"/> <b>IF ANSWER IS 2 GO TO CH7</b>

<p><b>CH6</b></p>	<p>[NAME OF CHILD]'s date of birth</p> <p>THE EXACT BIRTH DATE SHOULD ONLY BE TAKEN FROM AN AGE DOCUMENTATION SHOWING DAY, MONTH AND YEAR OF BIRTH.</p> <p>FOR PAPER-BASED SURVEYS: RECORD FROM AGE DOCUMENTATION. LEAVE BLANK IF NO VALID AGE DOCUMENTATION.</p> <p><b>BIRTHDAT</b></p>	<p>Day/Month/Year..... _ _ / _ _ /  _ _ _ _ _ </p>	
<p><b>CH7</b></p>	<p>Age of [NAME OF CHILD] in months</p> <p><b>Lower limit=0 months (or 6 months if the IYCF module is not included)</b></p> <p><b>Upper limit=59.99 months</b></p> <p><b>MONTHS</b></p>	<p>SINCE NO AGE DOCUMENTATION IS AVAILABLE, ESTIMATE AGE USING A LOCAL EVENTS CALENDAR.</p> <p>FOR PAPER-BASED SURVEYS: IF AGE DOCUMENTATION AVAILABLE, RECORD THE AGE IN MONTHS FROM THE DATE OF BIRTH.</p>	<p> _ _  months</p>
<p><b>Note</b></p>	<p>Verify that the child is \${MONTHS} months old. Remember, if they are older than 59 months; they are not eligible for inclusion and you should stop here.</p>		
<p><b>SECTION CHILD2: Time of Arrival in Country of Asylum (Optional/If applicable)</b></p> <p>THIS SECTION IS TO BE ADMINISTERED TO ALL CHILDREN BETWEEN 0 AND 59 MONTHS OF AGE (OR BETWEEN 6 AND 59 MONTHS IF THE IYCF MODULE IS NOT INCLUDED).</p>			
<p><b>Note</b></p>	<p>EXPLAIN TO THE RESPONDENT THAT THESE QUESTIONS WILL BE KEPT CONFIDENTIAL AND WILL NOT AFFECT THE ASSISTANCE THEY RECEIVE / ARE ENTITLED TO.</p>		
<p><b>CH8</b></p>	<p>Did [NAME OF CHILD] arrive to [camp name / country of asylum] before or after [INSERT THE EVENT RESPONSIBLE FOR THE INFLUX OF REFUGEES]?</p> <p>(OPTIONAL/IF APPLICABLE)</p> <p><b>CHARRIVE</b></p>	<p>Arrived before [INSERT EVENT] .....1</p> <p>Arrived after [INSERT EVENT] (new arrival) .....2</p> <p>Don't know .....8</p>	<p> _ </p>

<b>SECTION CHILD3: Nutrition, Health and Anaemia Status of the Child 6-59 months</b> THIS SECTION IS TO BE ADMINISTERED TO ALL CHILDREN BETWEEN 6 AND 59 MONTHS OF AGE. EXCLUDE HB MEASUREMENTS IF SENS MODULE 2 (ANAEMIA MODULE) IS NOT INCLUDED. IN MDC SURVEYS, THIS SECTION IS AUTOMATICALLY SKIPPED FOR THE CHILDREN NOT ELIGIBLE BASED ON AGE (<6 MONTHS).			
<b>CH9</b>  <b>CHPRES</b>	Is [NAME OF CHILD] currently present in the household?  _____	Yes.....1 No.....2	_____  <b>IF ANSWER IS 2</b>  <b>GO TO CH16</b>
<b>CH10</b>  <b>WEIGHT</b>	[NAME OF CHILD]'s weight in kilograms (±0.1kg)  DON'T FORGET THE DECIMAL.  <b>Lower limit=3.0kg</b>  <b>Upper limit=31.0kg</b>		_____ . _____ kg
<b>CH11</b>  <b>CLOTHES</b>	Was [NAME OF CHILD] dressed with clothes for the weight measurement? (OPTIONAL)	Yes.....y No.....n	_____
<b>CH12</b>  <b>HEIGHT</b>	[NAME OF CHILD]'s length/height in cm (±0.1cm)  DON'T FORGET THE DECIMAL.  <b>Lower limit=54.0cm</b>  <b>Upper limit=124.0cm</b>		_____ . _____ cm
<b>CH13</b>  <b>MEASURE</b>	Was [NAME OF CHILD] measured lying down or standing up?	Child lying down.....l Child standing up.....h	_____
<b>CH14</b>  <b>EDEMA</b>	Clinical examination: Does [NAME OF CHILD] present bilateral pitting oedema?	Yes.....y No.....n	_____

<p><b>CH15</b></p>	<p>[NAME OF CHILD]'s middle upper arm circumference (MUAC) in mm (±1mm) or cm (±0.1cm)</p> <p>MEASURE LEFT ARM.</p> <p>APPLICABLE ONLY IF MUAC MEASURED IN CM: DON'T FORGET THE DECIMAL.</p> <p><b>Lower limit=70mm</b></p> <p><b>Upper limit=235mm</b></p> <p><b>MUAC</b></p>		<p>     _ _ _ mm</p> <p>OR</p> <p>     _ _ .  _  cm</p>
<p><b>CH16</b></p>	<p>Is [NAME OF CHILD] currently being treated in [NAME OF NUTRITION PROGRAMMES] for malnutrition?</p> <p>SHOW COMMODITY PROVIDED IN TSFP AND TFP (OTP/SC).</p> <p><b>ENROL</b></p>	<p>Yes TSFP .....1</p> <p>Yes TFP (OTP/SC) .....2</p> <p>No .....3</p> <p>Don't know .....8</p>	<p>     _ </p>
<p><b>CH17</b></p>	<p>Is [NAME OF CHILD] currently enrolled in the BSFP? (IF APPLICABLE)</p> <p>SHOW COMMODITY/PACKAGING PROVIDED IN BSFP.</p> <p><b>BSFP</b></p>	<p>Yes .....1</p> <p>No .....2</p> <p>Don't know .....8</p>	<p>     _ </p>
<p><b>CH18</b></p>	<p>Has [NAME OF CHILD] been vaccinated against measles?</p> <p>CHECK VACCINATION CARD (ONLY FOR CHILDREN OLDER THAN 9 MONTHS).</p> <p><b>MEASLES</b></p>	<p>Yes, card .....1</p> <p>Yes, recall .....2</p> <p>No or don't know .....3</p>	<p>     _ </p>
<p><b>CH19</b></p>	<p>Has [NAME OF CHILD] received a vitamin A capsule in the past six months?</p> <p>CHECK VACCINATION/HEALTH CARD AND SHOW CAPSULE.</p> <p><b>VITA</b></p>	<p>Yes, card .....1</p> <p>Yes, recall .....2</p> <p>No or don't know .....3</p>	<p>     _ </p>

<p><b>CH20</b></p>	<p>Was [NAME OF CHILD] given any drug for intestinal worms in the last six months? (IF APPLICABLE)</p> <p>SHOW TABLET.</p> <p><b>DEWORM</b></p>	<p>Yes.....1</p> <p>No.....2</p> <p>Don't know.....8</p>	<p style="text-align: right;"><input type="checkbox"/></p>
<p><b>CH21</b></p>	<p>Has [NAME OF CHILD] had diarrhoea in the past 2 weeks?</p> <p>CASE DEFINITION: THREE OR MORE LOOSE OR LIQUID STOOLS DURING 24 HOURS.</p> <p><b>DIAR</b></p>	<p>Yes.....1</p> <p>No.....2</p> <p>Don't know.....8</p>	<p style="text-align: right;"><input type="checkbox"/></p> <p><b>IF ANSWER IS 2 OR 8</b></p> <p><b>GO TO CH23</b></p>
<p><b>CH22</b></p>	<p>Did you give [INSERT LOCAL NAME FOR WHO ORS] to [NAME OF CHILD] when s/he had diarrhoea? (OPTIONAL)</p> <p>SHOW ORS SACHET.</p> <p><b>DIARORS</b></p>	<p>Yes.....1</p> <p>No.....2</p> <p>Don't know.....8</p>	<p style="text-align: right;"><input type="checkbox"/></p>
<p><b>CH23</b></p>	<p>Did you give zinc tablets or syrup to [NAME OF CHILD] when s/he had diarrhoea? (OPTIONAL)</p> <p>SHOW ZINC TABLET OR SYRUP.</p> <p><b>DIARZINC</b></p>	<p>Yes.....1</p> <p>No.....2</p> <p>Don't know.....8</p>	<p style="text-align: right;"><input type="checkbox"/></p>
<p><b>CH26 Automatic referral for child with signs of acute malnutrition who is not already enrolled in a nutrition programme</b></p> <ul style="list-style-type: none"> <li>• Child needs to be referred for moderate acute malnutrition (if MUAC&lt;125mm and MUAC≥115 mm and/or WHZ&lt;-2 and WHZ≥-3 and if ENROL equals to 3 or 8).</li> <li>• Child needs to be referred for severe acute malnutrition (if MUAC&lt;115mm and/or WHZ&lt;-3 and/or bilateral pitting oedema is yes and if ENROL equals to 3 or 8).</li> </ul> <p>FILL OUT A REFERRAL FORM: ONE SLIP IS FOR THE MOTHER/CAREGIVER AND THE OTHER IS FOR THE HEALTH FACILITY.</p> <p><b>REFMAM/REFSAM</b></p>			
<p>Interviewer: I confirm that questionnaire is complete: yes/no</p>			
<p>Supervisor: I confirm that questionnaire is complete.: yes/no</p> <p>MESSAGE TO INTERVIEWER: DO NOT ANSWER THIS QUESTION.</p>			

## Annex 4- WOMAN sens questionnaire

See SENS Pre-Module tools: [Tool 11-Full SENS questionnaire] and [Tool 12-Full SENS Questionnaire with Instructions].



No	QUESTION	ANSWER CODES	
<p><b>SECTION WM1: Details of the Woman 15-49 years</b></p> <p>THIS SECTION IS TO BE ADMINISTERED TO ALL ELIGIBLE WOMEN AGED BETWEEN 15 AND 49 YEARS IN THE SELECTED HOUSEHOLDS.</p>			
<b>Note</b>	THESE QUESTIONS NEED TO BE ASKED TO EACH ELIGIBLE WOMAN		
<b>WM1</b>	ID Number		_
	<b>WMID</b>		
<b>WM2</b>	<p>Was consent given for conducting the interview and the measurements?</p> <p>ENSURE THAT YOU HAVE INTRODUCED THE TEAM AND INFORMED THEM ABOUT THE INTERVIEW AND THE MEASUREMENTS.</p> <p><b>WMCONST</b></p>	<p>Yes.....1</p> <p>No.....2</p> <p>Absent.....3</p>	_
			<b>IF ANSWER IS 2 or 3 STOP HERE</b>
<b>WM3</b>	<p>Name of the woman</p> <p>ONLY WRITE FIRST NAME.</p> <p><b>WMNAME</b></p>	_____	
<b>WM4</b>	<p>Age of [NAME OF WOMAN] in years</p> <p>ONLY WOMEN BETWEEN 15 AND 49 ARE BEING INTERVIEWED.</p> <p><b>Lower limit=15 years</b></p> <p><b>Upper limit=49 years</b></p> <p><b>WMAGE</b></p>		_ _ years

<b>SECTION WM2: Anthropometry, Physiological and Anaemia Status of the Woman 15-49 years</b> THIS SECTION IS TO BE ADMINISTERED TO ALL ELIGIBLE WOMEN BETWEEN 15 AND 49 YEARS IN THE SELECTED HOUSEHOLD.			
<b>WM5</b>  Are you pregnant?  <b>PREGNANT</b>	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>	<b>IF ANSWER IS 2 OR 8 GO TO WM8</b>
<b>WM6</b>  Are you currently <u>enrolled</u> in the ANC programme?  <b>ANC</b>	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>	
<b>WM7</b>  Are you currently <u>receiving</u> iron-folate pills?  SHOW PILL.  <b>FEREC</b>	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>	
<b>WM8</b>  Are you currently breastfeeding?  <b>LACTAT</b>	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>	<b>IF ANSWER IS 2 OR 8 GO TO WM10</b>
<b>WM9</b>  Is the child you are breastfeeding younger than 6 months old?  <b>LACTATU6</b>	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>	
<b>WM10</b>  Are you currently enrolled in the BSFP? (IF APPLICABLE)  SHOW COMMODITY/PACKAGING GIVEN IN BSFP.  <b>WMBSFP</b>	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>	

<p><b>WM11</b></p>	<p>[NAME OF WOMAN]'s MUAC in mm (±1mm) or cm (±0.1cm) (OPTIONAL)</p> <p>MEASURE LEFT ARM</p> <p>APPLICABLE ONLY IF MUAC MEASURED IN CM: DON'T FORGET THE DECIMAL</p> <p><b>Lower limit=160 mm</b></p> <p><b>Upper limit=500 mm</b></p> <p><b>WMMUAC</b></p>		<p>     _ _ _ mm</p> <p>OR</p> <p>     _ _ .  _  cm</p>
<p><b>WM14</b></p>	<p><b>Automatic referral for woman with signs of acute malnutrition:</b></p> <ul style="list-style-type: none"> <li>• Woman needs to be referred for acute malnutrition (if MUAC&lt; [INSERT VALUE] mm) (TO BE INCLUDED ONLY IF MUAC IS MEASURED)</li> </ul> <p>FILL OUT A REFERRAL FORM: ONE SLIP IS FOR THE WOMAN AND THE OTHER IS FOR THE HEALTH FACILITY.</p> <p><b>WMREFMAL</b></p>		
	<p>Interviewer: I confirm that questionnaire is complete: yes/no</p>		
	<p>Supervisor: I confirm that questionnaire is complete.: yes/no</p> <p>MESSAGE TO INTERVIEWER: DO NOT ANSWER THIS QUESTION.</p>		

## Annex 5- Referral form

See SENS Anthropometry and Health **Tool 3** for the referral form.



REFERRAL FORM (CAREGIVER)	REFERRAL FORM (DUPLICATE FOR HEALTH FACILITY)
Woman <input type="checkbox"/> Child 6-59 mo <input type="checkbox"/>	Woman <input type="checkbox"/> Child 6-59 mo <input type="checkbox"/>
<b>Woman's Full Name:</b> _____	<b>Woman's Full Name:</b> _____
<b>Child's Full Name (if applicable):</b> _____	<b>Child's Full Name (if applicable):</b> _____
<b>Block number:</b> _____	<b>Block number:</b> _____
<b>Age:</b> _____ Months <input type="checkbox"/> Years <input type="checkbox"/>	<b>Age:</b> _____ Months <input type="checkbox"/> Years <input type="checkbox"/>
<b>Sex:</b> Female <input type="checkbox"/> Male <input type="checkbox"/>	<b>Sex:</b> Female <input type="checkbox"/> Male <input type="checkbox"/>
<b>Referred for:</b> Malnutrition <input type="checkbox"/> Severe anaemia <input type="checkbox"/>	<b>Referred for:</b> Malnutrition <input type="checkbox"/> Severe anaemia <input type="checkbox"/>
<b>Malnutrition</b> MUAC: _____ mm WHZ: _____	<b>Malnutrition</b> MUAC: _____ mm WHZ: _____
Oedema: <input type="checkbox"/> Yes <input type="checkbox"/> No	Oedema: <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Severe anaemia</b> Hb: _____ g/dL	<b>Severe anaemia</b> Hb: _____ g/dL
SENS Survey team number: _____	SENS Survey team number: _____
Date: _____	Date: _____
Signature of team leader: _____	Signature of team leader: _____



### STANDARDIZATION OF ANTHROPOMETRIC EQUIPMENT

- Ensure all anthropometric equipment is functioning and not damaged. If any equipment is damaged and needs to be replaced, record the details in the column “Remarks on equipment condition”.
- Before the anthropometric standardization test, label each piece of equipment with a distinct number:
  - Scales from 1 to n
  - Height boards from 1 to n
  - MUAC tapes from 1 to n



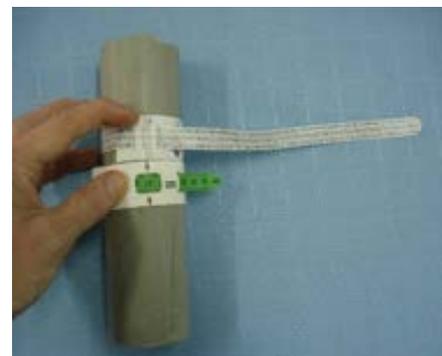
Watch out for bad quality tapes on wooden height boards preventing accurate reading!

- Measure each scale twice with a standard weight (min. 5 kg).



A wooden board to stabilise electronic scale on the ground should be used.

- Measure each height board with a wooden stick of 110.0 cm. and the MUAC tapes with a plastic pipe.

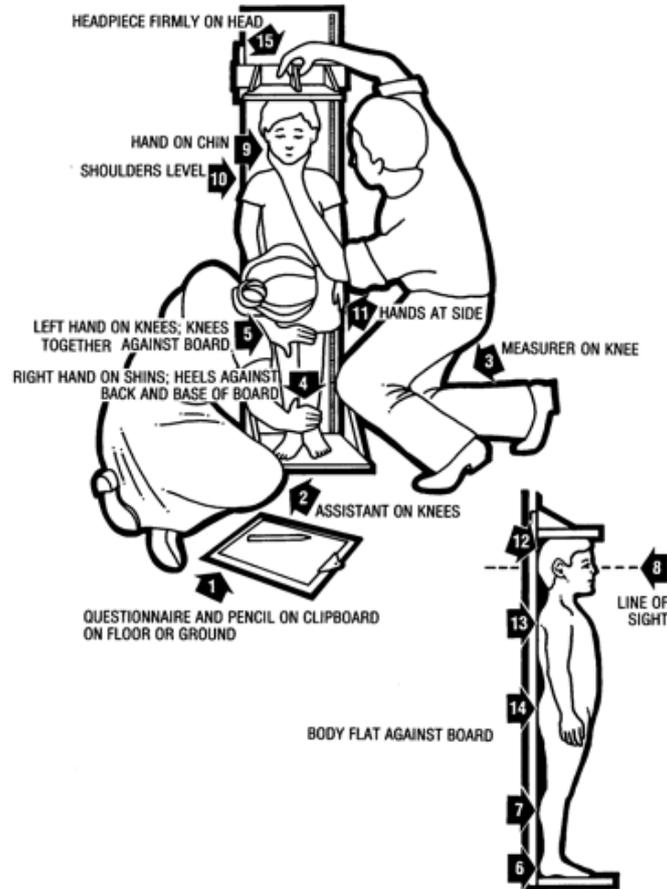


- Supervisors should always plan for spare equipment in case of problems.

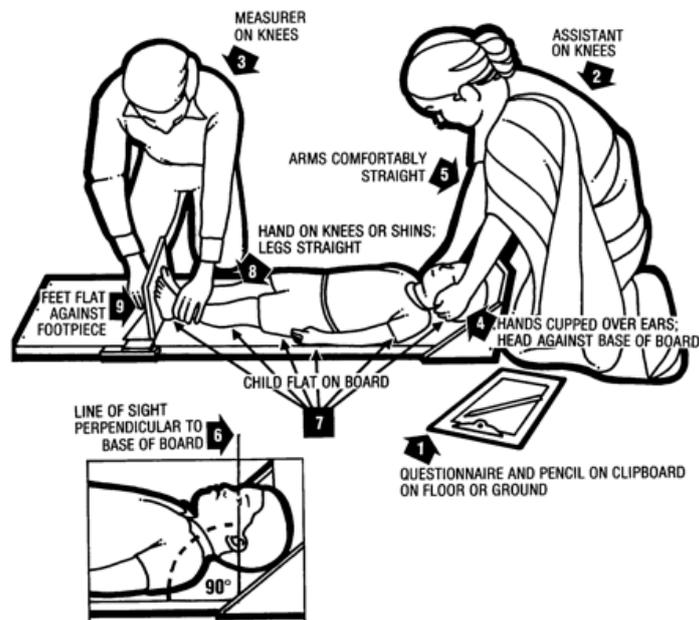
If any equipment is found to be not functioning during data collection, call the supervisor and request to exchange it immediately.

## Annex 7- Pictures of anthropometric measurements

### Measurement of height for children 87 cm and above (or 24 months and above)



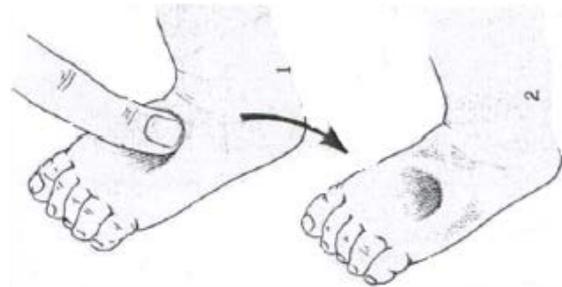
### Measurement of length for children <87 cm (or < 24 months)



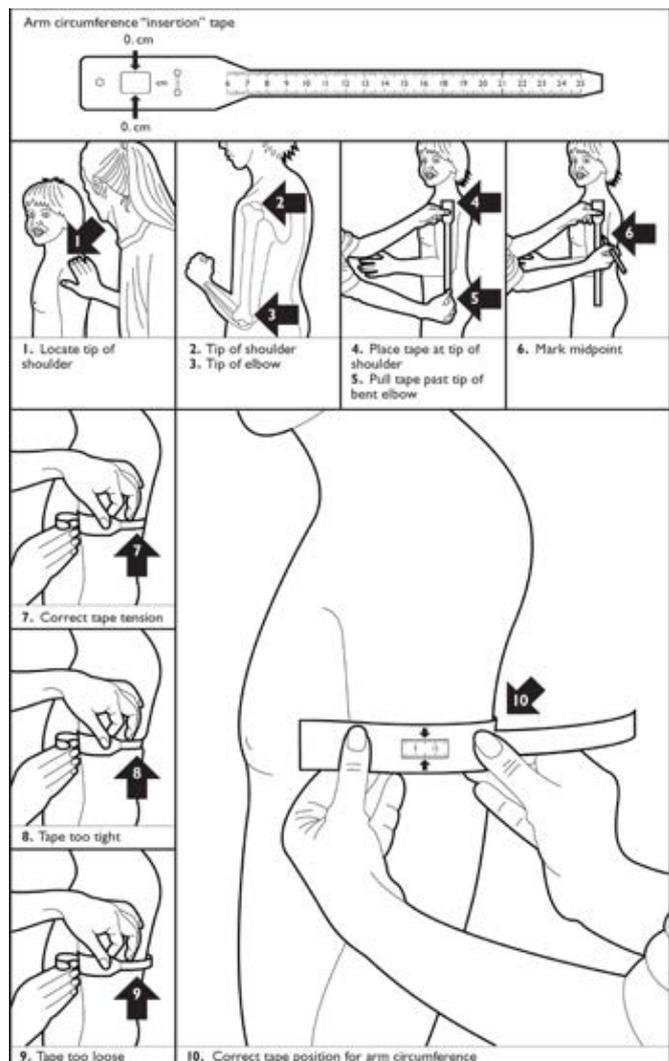
**Measurement of weight with the electronic scale (mother-child function)**



**Bilateral pitting oedema diagnostic test**



**Measurement of MUAC**



## Annex 8- Plausibility checks on anthropometric data proposed by the SMART Initiative: Identification of extreme nutritional values, selection bias and measurement bias

### What are the challenges when collecting survey data on the field?

- No matter how well a nutrition survey is planned and coordinated, the following challenges are often encountered:
  - Surveys are done very rapidly because of limited time and budget available.
  - Limited time is available for training survey teams before the start of data collection.
  - Available staff has limited experience in data collection and are not aware of the correct way to assess the information.
  - Supervision of teams can be quite complex at times because of problems with security or access.
  - The survey manager cannot control what happens in the field when the teams are left alone, unsupervised.
  - Problems with team dynamics that affect work output.
- These challenges, amongst others, can impact on the quality and reliability of anthropometric data derived from nutrition surveys. If the quality of the anthropometric data is questionable, this means that the malnutrition results may not be a good representation of reality. This in turn means that interpretation of contextual information on potential risk factors for malnutrition, such as food security, feeding practices or WASH could be flawed. Programme planning and resources can therefore be less efficient and communities may not be provided with the best possible programmes.
- These challenges have promoted an extensive amount of work to develop methods for doing nutrition surveys, which ensure that the most reliable data are produced with the greatest ease and at the least cost. The SMART (*Standardised Monitoring and Assessment of Relief and Transition*) initiative is one of the best known initiatives in this area of work.

### What is SMART?

- SMART is an initiative, launched in 2002, which promotes best practices in survey methodology and aims to contribute to:
  - Standardisation of anthropometric and mortality survey methods conducted in emergencies (collected simultaneously or separately);
  - Improving the quality of the anthropometric and mortality surveys; and
  - Providing users with easy-to-use tools i.e. manual, software, questionnaires, protocol, a plausibility report for assessing data quality (see section below) and standard template for the final report.

***Things to watch out for:*****• Does a SMART survey use new methods?**

- Using the term 'SMART survey' leads some people to mistakenly think that it is 'something' new and that it is totally different from a nutritional survey. SMART is not considered to be a 'new' methodology but rather an approach which adds to the already established and tested methods. It builds on the 'traditional' 30x30 nutrition cluster survey method, which was in fact first adopted as part of efforts to improve the quality of survey data.

**• Is a SMART survey always a good survey?**

- Some users believe that if their survey is 'SMART', then the survey is automatically good; which is not necessarily the case!

**• Is a SMART survey different than a SENS survey?**

- A SENS survey is a SMART survey that collects additional indicators. A basic SMART survey will usually collect minimal additional information apart from anthropometric and/or mortality indicators.

***What is the plausibility check?***

- The plausibility check is one of the key tools in SMART for data review of the anthropometric data. It allows evaluation of the quality of the anthropometric data and identification of specific types of errors, such as digit preference. At the end of each survey day, anthropometric data should be transferred / entered in the ENA software in order to generate the plausibility check report. The plausibility check results can be used to identify and correct mistakes as they happen.
- The plausibility report focuses on the analysis of acute malnutrition / wasting because this is the primary outcome in most nutrition surveys conducted in emergencies.
- As almost all countries have integrated the WHO Growth Standards (2006), the plausibility check is generated based on these standards only.
- The plausibility check analyses the characteristics of the anthropometric data using some previously published statistical approaches, but also uses some innovative and unpublished statistical approaches. It uses the results from these various statistical tests to provide an evaluation of the anthropometric data based on different criteria, for each individual survey team and also provides an overall score for the survey. Detailed information on the criteria used in the plausibility check is provided in the **SMART initiative documentation (see Reference section)**.

***How to use the plausibility check?***

- Some sections of the plausibility report need to be looked at regularly and on a daily basis during survey implementation in order to target the teams to supervise more and improve the way anthropometric data is being collected. Other sections need to be looked at only after data collection is complete for data review, final analysis and interpretation.

- All tests done by the plausibility check should be considered in their entirety, taking into account the context and interpretation of the results before decisions on the validity of the data are made. The different tests are meant to draw attention to areas where there may be possible problems but, by themselves, should not be used to accept or reject data. The higher the score, the more problematic the survey may be. A 'problematic' score above 25% should lead to a careful examination of the anthropometric data for all teams and by team but, by itself, does not necessarily mean that the data is of poor quality. Further details are provided in **Table 43** below.
- When the quality of the anthropometric data is not sufficient at the end of the survey, SMART provides recommendations for the reporting of malnutrition results to ensure the data can be used and results are not rejected.
  - More specifically, when the anthropometric data quality is problematic, SMART recommends using the calculated prevalence of wasting (from the observed mean with an SD of 1; this is provided in the plausibility check and cannot easily be calculated by hand) as opposed to the counted prevalence of wasting (these are the most frequently reported results calculated by simply dividing the number of cases by the total number of children surveyed  $\square$  100). As an alternative, SMART also recommends excluding results from problematic team(s) to derive the overall acute malnutrition prevalence estimate to base intervention planning. SMART suggests that these results, although still associated with a degree of uncertainty, are most likely to be a better representation of reality on which programme activities could be planned. When excluding survey teams with low quality anthropometric results, the resulting sample size should be large enough to get precise results and, if cluster sampling is used, the minimum number of clusters should be at least 25. Detailed information is provided in the **SMART initiative documentation (see Reference section)**.

### *Things to watch out for:*

- Experience has shown that there has been some 'misuse' of the plausibility check because of misunderstanding of how to use the results appropriately:
- **Example 1:** in country A, a survey manager sent teams back to the individual clusters which had a SD out of range for WHZ because the overall WHZ SD of the survey was below 0.8 and they thought that they did something wrong: it does not mean anything to look at the WHZ SD per cluster as several clusters have to be grouped for a meaningful analysis to be done!
- **Example 2:** in country B, a survey manager sent teams back to the field to re-measure the flagged children at the end of the survey even though there were very few of them: Some of the villages were 3-4 hours drive away and there was therefore an important waste of fuel and other resources. There will always be flagged children and this is accounted for by inflating the minimum calculated sample size by the non-response rate!
- **Example 3:** in country C, a survey manager looked at the flags shown in the Plausibility Check for one cluster and sent teams back to the field for re-measurements: the flags described in the Plausibility Check (also known as 'SMART flags') should only be checked at the end of the survey once sample size is large enough for a meaningful analysis to be conducted! SMART flags should not be assessed for one cluster alone.

- **Example 4:** in country D, the survey data was made up to fit the criteria of the plausibility check perfectly! Obviously, this must never be done as it requires falsifying information and reporting untrue information.

***What are the quality criteria to check during the survey and include in the final nutrition survey report?***

- The SMART quality criteria shown in **Table 43** should be carefully assessed and presented in the final SENS nutrition survey report. They have been selected for the UNHCR SENS report because they are the most frequently used ones to date and are the easiest ones to interpret. Because nutrition survey reports are used by multiple stakeholders who need to use the malnutrition prevalence results, it is important that they see an assessment of the quality of the results to help them in decision making for their programmes.
- Instructions for presentation of the SMART quality criteria from the Plausibility Report in the final SENS report are as follows:
  - If Plausibility Check overall score  $\leq 25\%$ , only show the overall data quality summary table in the Appendix of the SENS report.
  - If Plausibility Check overall score  $>25\%$ , carefully examine the anthropometric data for all teams and by team; and show the details of the problematic areas in the Appendix of the SENS report along with a short interpretation. UNHCR HQ / Regional Offices should be contacted for assistance in analysing problematic scores from the SMART Plausibility Check reports.

***Things to note:***

- Although every survey manager should strive for the best quality results to ensure programme planning can be done well, no survey is expected to be 'perfect' because of the many challenges encountered in reality (see above).
- Survey managers should be transparent about the quality of the anthropometric data collected. Of course, when the survey is finished, little can be done about the identified problem(s), if any, that occurred and it should be made sure that the survey manager learns from this for his or her own professional development and teams do not repeat similar mistakes in future assessments. Efforts should be made to train the teams well, structure the teams appropriately, choose the right people, use good quality equipment that is regularly tested during the survey and perform regular supervision visits to provide support to the 'weakest' teams.

**TABLE 43** QUALITY CRITERIA USED BY SMART

SMART quality criteria and recommendations (detailed information is provided in the SMART initiative documentation)			When to check	Things to watch out for
Quality criteria	Acceptable range or cut-off	Description		
<p><b>Missing values and flagged data (refer to SENS Pre-Module Step 14 for more details)</b></p>	<p>Flagged values for weight-for-height z-score (WHZ) should not exceed 7.5% of the sample size.</p>	<p>Flags are used to identify children with data out of the usual range that are likely to be incorrect because of unlikely combinations of weight, height, age and sex data.</p> <p>Besides excluding data from children who have missing information or are out of the required range, it is also important to exclude data from children who have improbable nutrition index values during data review.</p> <p>If there are a large number of flagged values or missing data for nutritional indices, the reliability of the survey data can be questionable.</p> <p>The flagged values should be reviewed and checked against the values manually entered in the participants and measures control sheet (for paper-based surveys, check with the original questionnaire). Check weights, heights, and ages of all children listed with a flag.</p> <p>Any error in data entry should be corrected. If there are still some flagged values after checking, you must assume that there was an error during measurement or recording in the field. You cannot correct these types of errors so you should exclude the remaining flagged values before further analysis (this is automatically done in the ENA for SMART software).</p> <p>Refer to <b>Table 43</b> shown below regarding the different types of flagging criteria used.</p>	<p>At end of survey, after data collection is complete for all teams.</p>	<p>It should be borne in mind that the sample size for this type of survey is calculated to provide a precise estimate of GAM. The estimate of SAM prevalence will not be as precise and, at times, may therefore be affected quite significantly by deleting some extreme / flagged values.</p> <p>Please note that the plausibility check report should always be generated using exclusion range <math>\pm 3</math> Z-scores for the SMART flags to make sure that quality criteria cut-offs are the same across all surveys evaluated by ENA for SMART. If a different exclusion range is used, it should be justified and be clearly explained in the final SENS report.</p>

SMART quality criteria and recommendations (detailed information is provided in the SMART initiative documentation)			When to check	Things to watch out for
Quality criteria	Acceptable range or cut-off	Description		
<b>Sex ratio</b>	Sex ratio should be between 0.8 and 1.2.	<p>The sex ratio (number of male divided by number of female) should be around 1. This verifies that both sexes are equally distributed, and hence that no selection bias has occurred and confirms the representativeness of the sample.</p> <p>If there is a sex bias, this needs to be explained in the report.</p> <p>Reasons for possible sex bias:</p> <p>1) During the survey, one sex (either boys or girls) who are out playing is less likely to be measured: this is often due to lack of communication with communities on the survey dates.</p> <p>2) Faulty selection procedure: this kind of scenario can happen if a population believes that a certain sex should not be shown to strangers, or if one sex is hidden. Surveyors may not be aware of this and the survey manager should investigate while the survey is still on-going why the sex ratio is unbalanced to be able to fix any misunderstanding with the community.</p> <p>3) Sampling not being done randomly: when the methodology was not strictly adhered to by survey teams or when the survey manager did not use a random method for sample selection.</p>	<p>1. As the survey is being implemented and a reasonable number of children have been surveyed, individual teams can be checked for sex ratio. Target supervision to the 'weakest' teams!</p> <p>2. At end of the survey, after data collection is complete for all teams.</p>	<p>Be aware that if the sex ratio is out of range it may not necessarily be due to a failure in the sampling methods.</p> <p>If sampling and selection of eligible children was done appropriately, the obtained ratio should be similar to that of the population the sample of children was drawn from. Therefore, it is possible to get an imbalance in the proportion of males / females when there is a high sex-related mortality. This can happen if either boys or girls suffered a higher mortality rates in the past.</p>

SMART quality criteria and recommendations (detailed information is provided in the SMART initiative documentation)			When to check	Things to watch out for
Quality criteria	Acceptable range or cut-off	Description		
<b>Age distribution and age ratio (6-29 months/ 30-59 months)</b>	<p>Different age groups should be equally represented.</p> <p>The expected age ratio of children 6-29 months of age to children 30-59 months of age should be around 0.85.</p>	<p>Similarly to sex, if age distribution is ok, then there is no selection bias of children. This confirms the representativeness of the sample and makes sure the sample is representative of the age group originally targeted for the survey.</p> <p>A distribution according to age will show whether or not the sample under or over represents any particular age group (for example, too many young children because the older children were playing outside the house and were not measured).</p> <p>Age bias in particular can be a serious problem for anthropometric data because younger children (6-29 months) are likely to be more malnourished than older children (30-59 months). This means that if the sample has too many young children (this often happens because it is more difficult to estimate age for older children), there is an over-representation of younger children and the prevalence of malnutrition is likely to be artificially raised compared with the actual prevalence of malnutrition. On the contrary, if the sample has too many older children (this is a rarer situation), this may give a lower prevalence of malnutrition than the reality.</p> <p>If there is an age bias, this needs to be explained in the report.</p> <p>Reasons for possible age bias:</p> <ol style="list-style-type: none"> <li>1) Errors (imprecision in age estimation);</li> <li>2) Inadvertent exclusion of certain children (especially older children);</li> <li>3) Faulty selection procedure: this kind of scenario can happen if a population believes that a certain age group should not be shown to strangers. Surveyors may not be aware of this and the survey manager should investigate while the survey is still on-going why the age distribution is unbalanced to be able to fix any misunderstanding with the community;</li> <li>4) Sampling not being done randomly: when the methodology was not strictly adhered to.</li> </ol> <p>Often there are peaks biasing age estimates towards whole years. Peaks are frequently seen at the 12, 24, 36 and 48 months because the age of the child is rounded: this suggests insufficient probing by the surveyors who are not estimating ages well with a local events calendar.</p>	<ol style="list-style-type: none"> <li>1. As the survey is being implemented and a reasonable number of children have been surveyed, individual teams can be checked for age distribution and peaks in ages. Target supervision to the 'weakest' teams!</li> <li>2. At end of survey, after data collection is complete for all teams.</li> </ol>	<p>Be aware that if the age distribution is not as expected it may not necessarily be due to a failure in the sampling methods or age estimation.</p> <p>If sampling and assessment of age was done appropriately, the obtained age distribution should be similar to that of the population the sample of children was drawn from. Therefore, it is possible to get an imbalance in the age group distribution when children of a specific age group are affected by higher mortality or when there was an important change in birth rates.</p> <p>Be aware that the default age distribution used in analysis in the Plausibility Check is based on typical demographic data assumptions for children aged 6-59 months in developing countries. For example, if there is a significant decrease in birth rate in your context, it can be expected to have less younger children than the 'norm'. If the nutrition survey is</p>

SMART quality criteria and recommendations (detailed information is provided in the SMART initiative documentation)			When to check	Things to watch out for
Quality criteria	Acceptable range or cut-off	Description		
	There should not be any obvious peaks of certain ages.	<p>If there are no obvious peaks, it can be concluded that the age data is of good quality. This will often be the case in surveys where there is a high proportion of age documentation available for children.</p> <p>Age heaping affects the quality of the age data but the age distribution is not necessarily affected by age heaping. Age heaping will not affect the quality of the weight-for-height outcomes however it can significantly affect height-for-age and weight-for-age outcomes (see below information on standard deviation).</p>		<p>conducted in settings with unique, uncommon age distribution, these context-specific demographic data should be used in analysis if available and reliable.</p> <p>Watch for teams reporting ages at adjacent numbers such as 11/13, 23/25, 35/37 and 47/49 months because they know you are checking for digit preference at 12, 24, 36, and 48! This type of heaping will also affect the quality of the age data.</p> <p>The number of children in a dataset without an exact birthdate is an important indication of the quality of the age data. The percentage of children with no exact birthdate is given in the plausibility check report and should be included in the final SENS report.</p>

SMART quality criteria and recommendations (detailed information is provided in the SMART initiative documentation)			When to check	Things to watch out for
Quality criteria	Acceptable range or cut-off	Description		
<b>Digit preference for weight, height and MUAC</b>	<p>There should not be any obvious peaks of certain digit for weight, height and MUAC.</p> <p>The digit preference scores should be <math>\leq 20</math>.</p>	<p>Digit preference informs about the precision of weight, height and MUAC measurements. Assessing the distribution of the final decimal for height, weight and MUAC will tell if the survey workers are rounding weight, height and / or MUAC measurements to the nearest kilogram or centimetre or millimetre, respectively and thereby taking inaccurate measures.</p> <p>This can be quickly assessed by reviewing the MDC forms or the questionnaires, and seeing if there is over-representation of values ending in .0 and .5. This can also be assessed easily with the Plausibility Report by teams; there may be one team that is 'cutting corners' or has been improperly trained or supervised.</p>	<p>1. As the survey is being implemented and a reasonable number of children have been surveyed, individual teams can be checked for digit preferences in weight and height measurements. Target supervision to the 'weakest' teams!</p> <p>2. At the end of the survey, after data collection is complete for all teams.</p>	<p>Watch for teams rounding measurements at adjacent number such as .1, .4/.6, .9 because they know you are checking for digit preference at .0 and .5! This type of heaping will affect the quality of the anthropometric data.</p> <p>Be aware that there is no digit preference possible for weight measurements when using an electronic scale! Therefore, do not go on to interpret this data for digit preference. Any 'peaks' observed will be due to chance alone.</p>

SMART quality criteria and recommendations (detailed information is provided in the SMART initiative documentation)			When to check	Things to watch out for
Quality criteria	Acceptable range or cut-off	Description		
<b>Standard deviation of WHZ (weight-for-height z-score)</b>	SD should be between 0.8 and 1.2 z-scores.	<p>The standard deviation for WHZ explains the dispersion of z-score values around the mean. If SD&gt;1, the distribution is more dispersed than the standard population. If SD&lt;1.0, the distribution is less dispersed than the standard population.</p> <p>This is the most common test done to assess the quality of the anthropometric data. The dispersion should be close to 1.0. The SD should be between 0.8 and 1.2.</p> <p>If the SD is &gt;1.2, it is likely that there was a lot of imprecision in measuring height and weight, which results in “noisy” data that creates “fuzzy” wide distributions. Note, that if data are imprecise it will not necessarily result in extreme values that will be flagged and excluded. “Noisy” imprecise data will result in wider than expected SD even after flags (extreme values) are excluded. If the SD is wider than expected, this will result in overestimation of prevalence of MAM and SAM. If the SD for WHZ is &gt;1.2 then SMART recommends that the calculated prevalence of malnutrition (from the mean with an SD of 1) should be reported. Furthermore, the data should be analysed by disaggregating the analysis by survey teams, and the standard deviations should be calculated for each of the indices and teams. This might reveal that one team made poor quality measurements (also look at the other quality criteria per team).</p>	At the end of survey, after data collection is complete for all teams.	Surveys with a WHZ SD< 0.8 or >1.2 require closer examination for possible problems related to anthropometric measurements. This does not mean that the survey results need to be rejected and ignored!

**What are the most frequently used flagging criteria for nutritional indices?**

- Different approaches are taken to dealing with ‘flagged’ or potentially implausible nutritional index data in the analysis. There is no consensus regarding this issue at present and different organisations conducting nutrition surveys use different cleaning criteria. **Table 44** summarises the different flagging criteria used in nutrition surveys conducted in emergencies. UNHCR currently recommends following the SMART recommendations for the exclusion of flags and hence excluding *SMART flags* from final analysis.
- The ENA for SMART and ENA has an option to manually specify exclusion criteria for flags and the programmes automatically conduct the final analysis after excluding the corresponding flags. When using this software, note that flags are not deleted from the database permanently; they are only excluded temporarily from final analysis of the specific variable. For example, if a child has a flag for WHZ, s/he can still be included for the analysis of the other indicators, e.g. measles vaccination, vitamin A supplementation, age and sex. If there are SMART flags detected in your dataset, find out the corresponding child(ren) and check the anthropometric data values manually entered in the participants and measures control sheet (for paper-based surveys, check with the original questionnaire). If it was a data entry error into the smartphones (on the paper questionnaire), correct it.
- It is important to mention in the final SENS report if any data were excluded from the analyses and why the data were excluded (see **Table 26** in Results section which provides this information).

**Things to note:**

- It is essential to bear in mind that one of the most important elements is comparison of the data between surveys (e.g. comparisons of a baseline survey with subsequent surveys in the same area to monitor programmes). Therefore, the more standardised the method is, the more comparable results will be, provided that the surveys are done according to protocol.
- In the same refugee operations and across regions, it is important that nutritional surveys conducted follow the same methodology and use the same quality criteria to clean and evaluate their data. Accordingly, the same cleaning criteria should be applied in nutrition surveys conducted in the same populations to allow comparisons.

**TABLE 44** FLAGGING CRITERIA USED FOR NUTRITIONAL INDICES IN NUTRITION SURVEYS CONDUCTED IN EMERGENCIES

Index	WHO 2006 Growth Standards	SMART flags*
<b>HAZ</b>	-6 to +6	-3 to +3
<b>WHZ</b>	-5 to +5	-3 to +3
<b>WAZ</b>	-6 to +5	-3 to +3
<b>Reference point</b>	0 z-score	observed mean
<b>Remarks</b>	<p>To be used when WHO Growth Standards population is used for analysis.</p> <p>These represent the 'pink' flags that appear in the Data Entry Anthropometry screen of ENA for SMART software and are defined in the Variable View screen. These flags are currently being referred to as 'WHO flags', 'Epi Info flags' or 'pink flags'.</p>	<p>These are flags are recommended by SMART.</p> <p>These are the flags that appear in the Plausibility Check and are currently being referred to as 'SMART flags'.</p>
<b>Reference</b>	WHO 2006 Growth Standards and WHO ANTHRO software	SMART Initiative

**Source:** Adapted from Concern Worldwide Nutrition Survey Guidelines, Version 1 December 2008. Health Support Unit, Dublin.

\* Please note that the plausibility check should always be generated using exclusion range  $\pm 3$  Z-scores to make sure that quality criteria cut-offs are the same across all surveys evaluated by ENA for SMART. When reporting survey results, exclusion range may be modified to be wider than  $\pm 3$  only if the overall quality of the survey is high based on the plausibility check (e.g., if the percentage of flags is below 1% and the observed SD after exclusion of SMART flags is below 11). In such situations when data quality is high, then the exclusion range can be changed to  $\pm 3.5$  Z-scores (From The SMART Plausibility Check for Anthropometry, October 2015).

## Annex 9- Epi info Analysis

### CHILDREN ANTHROPOMETRY AND HEALTH

Below are the standard Epi Info codes to use for analysis of the additional variables that are not automatically analysed by ENA for SMART.

Refer to the fictitious dataset available for practical purposes; Go to SENS Anthropometry and Health tool: [Tool 5- CH Data], and see the Excel database PIL\_0618\_CH\_PILOT.



The practical Excel database PIL\_0618\_CH\_PILOT is from a SENS survey using *simple random sampling*.

### DATA REVIEW

#### Ranges and codes

Run these commands (together or separately; regardless of the survey design) and make sure that the ranges and codes of the variables entered in the database match the standard questionnaire. This step can be omitted when using MDC surveys given that ranges and codes are pre-set, and that values outside of the pre-set ranges and codes cannot be entered during data collection.

#### FREQ CHCONST

For the below variables, only perform these checks on children having provided consent, i.e. `SELECT CHCONST=1`

FREQ CHARRIVE  
 FREQ ENROL  
 FREQ BSFP  
 FREQ MEASLES  
 FREQ VITA  
 FREQ DEWORM  
 FREQ DIAR  
 FREQ DIARORS  
 FREQ DIARZINC

The ranges and codes for the standard SENS variables shown below (SEX, MONTHS, WEIGHT, HEIGHT, EDEMA, MUAC) can be reviewed using ENA for SMART before analysis.

FREQ SEX  
 MEANS MONTHS  
 MEANS WEIGHT  
 FREQ CLOTHES  
 MEANS HEIGHT  
 FREQ MEASURE  
 FREQ EDEMA  
 MEANS MUAC

## Missing data

You should check the missing data in your database and make a note on this in the final SENS report. **Refer to the Data Review section for detailed instructions to follow with missing data.**

The commands below need to be run separately, one by one. After selecting the variable using the code shown below, use the LIST command to view the specific records with missing data. Then cancel the selected variable by typing SELECT and proceed with checking another variable.

**This step is important to do with MDC surveys as well as paper-based surveys.**

For the below variables, only perform these checks on children having provided consent, i.e. `SELECT CHCONST=1`

```
SELECT MONTHS >= 6 AND MONTHS<60 AND ENROL=(.)  
SELECT (this will cancel the selected variable)
```

```
SELECT MONTHS >= 6 AND MONTHS<24/36/60 AND BSFP=(.) (adapt upper age range to survey context)
```

```
SELECT MONTHS >= 9 AND MONTHS<60 AND MEASLES=(.)
```

```
SELECT MONTHS >= 6 AND MONTHS<60 AND VITA=(.)
```

```
SELECT MONTHS >= 12/24 AND MONTHS<60 AND DEWORM=(.) (adapt lower age range to survey context)
```

```
SELECT MONTHS >= 6 AND MONTHS<60 AND DIAR=(.)
```

```
SELECT MONTHS >= 6 AND MONTHS<60 AND DIAR=1 AND DIARORS=(.)
```

```
SELECT MONTHS >= 6 AND MONTHS<60 AND DIAR=1 AND DIARZINC=(.)
```

Missing data for the standard SENS variables (SEX, MONTHS, WEIGHT, HEIGHT, EDEMA, MUAC) can be reviewed using ENA for SMART before analysis by using the 'Sort' command on the Data Entry Anthropometry screen.

## DATA ANALYSIS

Results from the practical survey dataset entitled PIL\_0618\_CH\_PILOT (simple random sampling survey) are illustrated below. Refer to the SENS Pre-Module **Annex 4** for detailed explanations on how to interpret Epi-info analysis outputs when using different survey designs.

### TIME OF ARRIVAL ANALYSIS

#### Time of arrival (optional/if applicable)

CHILDREN'S ARRIVAL PROFILE (OPTIONAL/IF APPLICABLE) (ADAPT THE ARRIVAL PROFILE CATEGORIES SO THAT IT MAKES THE MOST SENSE FOR THE LOCAL SETTING)

Arrival profile	Number/Total	% (95% CI)
<b>Living in the camp/asylum country before</b> [ADAPT TO THE LOCAL SETTING THE EVENTS THAT PROVOKED THE INFLUX] E.g.: Living in the camp/asylum country before conflict started/new influx, etc.	499/502	99.4% (98.3-99.8)
<b>New arrival in the camp/asylum country after</b> [ADAPT TO THE LOCAL SETTING THE EVENTS THAT PROVOKED THE INFLUX] E.g.: New arrival (6 months or less)	3/502	0.6% (0.2-1.7)

SELECT MONTHS>=6 AND MONTHS<60

SELECT CHARRIVE<>8

FREQ CHARRIVE

If you are analysing a cluster survey, you need to use the Complex Sample commands in the Advanced Statistics module and the code is as follows:

FREQ CHARRIVE PSUVAR=CLUSTER

CHARRIVE	Frequency	Percent	Cum. Percent	
1	3	0,60%	0,60%	
2	499	99,40%	100,00%	
<b>Total</b>	<b>502</b>	<b>100,00%</b>	<b>100,00%</b>	

#### Wilson 95% Conf Limits

1	0,20%	1,74%
2	98,26%	99,80%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

### MEASLES VACCINATION ANALYSIS

MEASLES VACCINATION COVERAGE FOR CHILDREN AGED 9-59 MONTHS (OR OTHER CONTEXT-SPECIFIC TARGET GROUP)

	Number/total	% (95% CI)
Measles vaccination with card	22/469	4.7% (3.1-7.0)
Measles vaccination with card <u>or</u> confirmation from mother	442/469	94.2% (91.8-96.0)

***Measles vaccination coverage with card***

SELECT MONTHS>=9 AND MONTHS<60

FREQ MEASLES

If you are analysing a cluster survey, you need to use the Complex Sample commands in the Advanced Statistics module and the code is as follows:

FREQ MEASLES PSUVAR=CLUSTER

MEASLES	Frequency	Percent	Cum. Percent	
1	22	4,69%	4,69%	
2	420	89,55%	94,24%	
3	27	5,76%	100,00%	
<b>Total</b>	<b>469</b>	<b>100,00%</b>	<b>100,00%</b>	

**Wilson 95% Conf Limits**

1	3,12%	7,00%
2	86,46%	92,01%
3	3,99%	8,25%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

***Measles vaccination coverage with card or confirmation from mother***

SELECT MONTHS>=9 AND MONTHS<60

DEFINE MSL\_cc

RECODE MEASLES TO MSL\_cc

1 = "YES"

2 = "YES"

3 = "NO"

END

FREQ MSL\_cc

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ MSL\_cc PSUVAR=CLUSTER

MSL_CC	Frequency	Percent	Cum. Percent	
NO	27	5,76%	5,76%	
YES	442	94,24%	100,00%	
<b>Total</b>	<b>469</b>	<b>100,00%</b>	<b>100,00%</b>	

**Wilson 95% Conf Limits**

NO	3,99%	8,25%
YES	91,75%	96,01%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**VITAMIN A SUPPLEMENTATION ANALYSIS**

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

	Number/total	% (95% CI)
Vitamin A supplementation in the last 6 months with card	17/503	3.4% (2.1-5.4)
Vitamin A supplementation in the last 6 months with card <u>or</u> confirmation from mother	477/503	94.8% (92.5-96.5)

**Vitamin A capsule coverage with card**

SELECT MONTHS>=6 AND MONTHS<60

FREQ VITA

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ VITA PSUVAR=CLUSTER

VITA	Frequency	Percent	Cum. Percent	
1	17	3,38%	3,38%	
2	460	91,45%	94,83%	
3	26	5,17%	100,00%	
<b>Total</b>	<b>503</b>	<b>100,00%</b>	<b>100,00%</b>	

**Wilson 95% Conf Limits**

1	2,12%	5,35%
2	88,68%	93,59%
3	3,55%	7,47%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**Vitamin A capsule coverage with card or confirmation from mother**

SELECT MONTHS>=6 AND MONTHS<60

DEFINE VITA\_cc

RECODE VITA TO VITA\_cc

- 1 = "YES"
- 2 = "YES"
- 3 = "NO"

END

FREQ VITA\_cc

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ VITA\_cc PSUVAR=CLUSTER

VITA_CC	Frequency	Percent	Cum. Percent	
NO	26	5,17%	5,17%	
YES	477	94,83%	100,00%	
Total	503	100,00%	100,00%	

**Wilson 95% Conf Limits**

NO	3,55%	7,47%
YES	92,53%	96,45%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**DEWORMING ANALYSIS**

DEWORMING COVERAGE FOR CHILDREN AGED 12-59/24-59 MONTHS WITHIN THE PAST 6 MONTHS (OR OTHER CONTEXT-SPECIFIC TARGET GROUP)\* (IF APPLICABLE)

	Number/total	% (95% CI)
Deworming within the past 6 months	221/422	52.4% (47.6-57.1)

You need to select the target age group used in your survey area in the last deworming campaign (examples are shown below):

SELECT MONTHS>=12 AND MONTHS<60 AND DEWORM <>8  
 SELECT MONTHS>=24 AND MONTHS<60 AND DEWORM <>8

FREQ DEWORM

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ DEWORM PSUVAR=CLUSTER

DEWORM	Frequency	Percent	Cum. Percent	
1	221	52,37%	52,37%	
2	201	47,63%	100,00%	
Total	422	100,00%	100,00%	

**Wilson 95% Conf Limits**

1	47,60%	57,09%
2	42,91%	52,40%

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

### DIARRHOEA ANALYSIS

#### PERIOD PREVALENCE OF DIARRHOEA

	Number/total	% (95% CI)
<b>Diarrhoea in the last two weeks</b>	63/503	12.5% (9.9-15.7)

#### *Two week period prevalence of diarrhoea*

**SELECT MONTHS>=6 AND MONTHS<60 AND DIAR <>8**

**FREQ DIAR**

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

**FREQ DIAR PSUVAR=CLUSTER**

DIAR	Frequency	Percent	Cum. Percent	
<b>1</b>	63	12,52%	12,52%	
<b>2</b>	440	87,48%	100,00%	
<b>Total</b>	503	100,00%	100,00%	

#### Wilson 95% Conf Limits

<b>1</b>	9,91%	15,70%
<b>2</b>	84,30%	90,09%

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

#### ORS AND ZINC USE DURING DIARRHOEA EPISODE (OPTIONAL)

	Number/total	% (95% CI)
<b>ORS use during diarrhoea episode</b>	47/61	77.1% (64.5-86.9)
<b>Zinc tablet or syrup use during diarrhoea episode</b>	34/63	54.0% (40.9-66.6)

***Use of ORS during diarrhea episode (optional)***

SELECT MONTHS>=6 AND MONTHS<60 AND DIAR=1 AND DIARORS <>8

FREQ DIARORS

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ DIARORS PSUVAR=CLUSTER

DIARORS	Frequency	Percent	Cum. Percent	
1	47	77,05%	77,05%	
2	14	22,95%	100,00%	
<b>Total</b>	61	100,00%	100,00%	

**Exact 95% Conf Limits**

1	64,50%	86,85%
2	13,15%	35,50%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded)

***Use of zinc during diarrhea episode (optional)***

SELECT MONTHS>=6 AND MONTHS<60 AND DIAR=1 AND DIARZINC <>8

FREQ DIARZINC

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ DIARZINC PSUVAR=CLUSTER

DIARZINC	Frequency	Percent	Cum. Percent	
1	34	53,97%	53,97%	
2	29	46,03%	100,00%	
<b>Total</b>	63	100,00%	100,00%	

**Exact 95% Conf Limits**

1	40,94%	66,61%
2	33,39%	59,06%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

## NUTRITION PROGRAMME ENROLMENT ANALYSIS

PROGRAMME ENROLMENT FOR ACUTELY MALNOURISHED CHILDREN BASED ON ALL ADMISSION CRITERIA (MUAC, WHZ AND/OR OEDEMA)

	Number/total	% (95% CI)
<b>Supplementary feeding programme (TSFP) enrolment</b>	13/54	24.1% (13.5-37.6)
<b>Therapeutic feeding programme enrolment (OTP / SC)</b>	3/11	27.3% (6.0-61.0)

PROGRAMME ENROLMENT FOR ACUTELY MALNOURISHED CHILDREN BASED ON MUAC AND/OR OEDEMA ONLY

	Number/total	% (95% CI)
<b>Supplementary feeding programme (TSFP) enrolment</b>	5/12	41.7% (15.2-72.3)
<b>Therapeutic feeding programme enrolment (OTP / SC)</b>	0	0.0%

Refer to SENS Anthropometry and Health: [Tool 2- SOP on Setting Up ENA for SMART software] for guidance on how to conduct this analysis with MDC datasets.

The best way to conduct this analysis is to transfer to ENA the ENROL variable and export the anthropometric data along with the ENROL data from ENA to Excel. The WHZ (SMART) flags need to be excluded from the WHZ analyses by using the following PGM codes:

```
DEFINE Flag_WHZ_WHO YN
```

```
IF [Flag-WHO] = "WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

```
IF [Flag-WHO] = "WAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

```
IF [Flag-WHO] = "HAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

```
IF [Flag-WHO] = "WAZ,HAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

***Supplementary feeding programme enrolment***

**Based on all admission criteria (MUAC, WHZ)**

***Supplementary feeding programme eligibility***

DEFINE SFPE NUMERIC

```
IF [WHZ-WHO] >=-3.000 AND [WHZ-WHO] <-2.000 OR MUAC >=115 AND MUAC <125 AND EDEMA="n" THEN
    SFPE =1
ELSE
    SFPE =2
END

IF [WHZ-WHO] = (.) AND MUAC = (.) THEN
    SFPE = (.)
END
```

***Supplementary feeding programme enrolment***

Use the newly generated variable named 'Flag WHZ WHO' defined above to conduct the following analysis.

```
SELECT MONTHS>=6 AND MONTHS<60 AND SFPE =1 AND Flag_WHZ_WHO = (.) AND ENROL<>8

FREQ ENROL
```

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

```
FREQ ENROL PSUVAR=CLUSTER
```

ENROL	Frequency	Percent	Cum. Percent	
1	13	24,07%	24,07%	
2	6	11,11%	35,19%	
3	35	64,81%	100,00%	
<b>Total</b>	<b>54</b>	<b>100,00%</b>	<b>100,00%</b>	

**Exact 95% Conf Limits**

1	13,49%	37,64%
2	4,19%	22,63%
3	50,62%	77,32%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**Based on MUAC only**

**Supplementary feeding programme eligibility**

DEFINE SFPE\_MUAC NUMERIC

```
IF MUAC >=115 AND MUAC <125 AND EDEMA="n" THEN
    SFPE_MUAC = 1
ELSE
    SFPE_MUAC = 2
END
IF MUAC = (.) THEN
    SFPE_MUAC = (.)
END
```

**Supplementary feeding programme enrolment**

SELECT MONTHS>=6 AND MONTHS<60 AND SFPE\_MUAC = 1 AND ENROL<>8

FREQ ENROL

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ ENROL PSUVAR=CLUSTER

ENROL	Frequency	Percent	Cum. Percent	
1	5	41,67%	41,67%	
2	3	25,00%	66,67%	
3	4	33,33%	100,00%	
<b>Total</b>	<b>12</b>	<b>100,00%</b>	<b>100,00%</b>	

**Exact 95% Conf Limits**

1	15,17%	72,33%
2	5,49%	57,19%
3	9,92%	65,11%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

***Therapeutic feeding programme enrolment***

**Based on all admission criteria (MUAC, WHZ, oedema)**

***Therapeutic feeding programme eligibility***

DEFINE TFPE NUMERIC

IF EDEMA = "y" OR MUAC <115 OR [WHZ-WHO] <-3.000 THEN

TFPE = 1

ELSE

TFPE= 2

END

IF EDEMA = (.) AND MUAC = (.) AND [WHZ-WHO] = (.) THEN

TFPE = (.)

END

***Therapeutic feeding programme enrolment***

Use the newly generated variable named 'Flag WHZ WHO' defined above for to conduct the following analysis.

SELECT MONTHS>=6 AND MONTHS<60 AND TFPE= 1 AND Flag\_WHZ\_WHO=(.) AND ENROL<>8

FREQ ENROL

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ ENROL PSUVAR=CLUSTER

ENROL	Frequency	Percent	Cum. Percent	
1	3	27,27%	27,27%	
2	3	27,27%	54,55%	
3	5	45,45%	100,00%	
<b>Total</b>	11	100,00%	100,00%	

**Exact 95% Conf Limits**

1	6,02%	60,97%
2	6,02%	60,97%
3	16,75%	76,62%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**Based on MUAC and/or oedema only**

***Therapeutic feeding programme eligibility***

DEFINE TFPE\_MUAC NUMERIC

IF MUAC <115 OR EDEMA = "y" THEN

    TFPE\_MUAC = 1

ELSE

    TFPE\_MUAC = 2

END

IF EDEMA = (.) AND MUAC = (.) THEN

    TFPE\_MUAC = (.)

END

***Therapeutic feeding programme enrolment***

SELECT MONTHS>=6 AND MONTHS<60 AND TFPE\_MUAC = 1 AND ENROL<>8

FREQ ENROL

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ ENROL PSUVAR=CLUSTER

ENROL	Frequency	Percent	Cum. Percent	
3	1	100,00%	100,00%	
<b>Total</b>	1	100,00%	100,00%	

**Exact 95% Conf Limits**

3                      2,50%                      100,00%

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**Blanket supplementary feeding programme enrolment**

PROGRAMME ENROLMENT IN BLANKET SUPPLEMENTARY FEEDING (IF APPLICABLE)

	Number/total	% (95% CI)
<b>Blanket feeding programme enrolment</b>	462/503	91.9% (89.1-93.9)
<b>Product name</b>	Super Cereal Plus	
<b>Target age group</b>	6-59 months	

You need to select the target age group used in your survey area for the BSFP (examples are shown below):

SELECT MONTHS>=6 AND MONTHS<24 AND BSFP <>8

SELECT MONTHS>=6 AND MONTHS<36 AND BSFP <>8

SELECT MONTHS>=6 AND MONTHS<60 AND BSFP <>8

FREQ BSFP

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ BSFP PSUVAR=CLUSTER

BSFP	Frequency	Percent	Cum. Percent	
1	462	91,85%	91,85%	
2	41	8,15%	100,00%	
<b>Total</b>	<b>503</b>	<b>100,00%</b>	<b>100,00%</b>	

**Wilson 95% Conf Limits**

1 89,13% 93,93%

2 6,07% 10,87%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

### OVERWEIGHT ANALYSIS BY SEX AND BY AGE

The overweight tables shown below should be generated automatically by the ENA for SMART software. If it does not work, the instructions described below should be followed in Epi Info.

#### PREVALENCE OF OVERWEIGHT BASED ON WEIGHT-FOR-HEIGHT CUT OFF'S AND BY SEX (NO OEDEMA)

	All n =	Boys n =	Girls n =
Prevalence of overweight (WHZ > 2)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)
Prevalence of severe overweight (WHZ > 3)	(n) % (95% CI)	(n) % (95% CI)	(n) % (95% CI)

#### 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.	%
6-11					
12-23					
24-35					
36-47					
48-59					
Total					

The best way to conduct this analysis is to export the anthropometric data from ENA to Excel. The WHZ (SMART) flags need to be excluded from the WHZ analyses by using the following PGM codes:

```
DEFINE Flag_WHZ_WHO YN
```

```
IF [Flag-WHO] ="WHZ" THEN
    Flag_WHZ_WHO= (+)
END
```

```
IF [Flag-WHO] = "WAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

```
IF [Flag-WHO] = "HAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

```
IF [Flag-WHO] = "WAZ,HAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

**Overweight analysis**

```
DEFINE OVERWT NUMERIC
```

```
IF [WHZ-WHO] >2.000 AND EDEMA= "n"
```

```
THEN
```

```
    OVERWT =1
```

```
ELSE
```

```
    OVERWT =2
```

```
END
```

```
IF [WHZ-WHO] = (.) THEN
```

```
    OVERWT = (.)
```

```
END
```

```
SELECT MONTHS>=6 AND MONTHS<60 AND Flag_WHZ_WHO = (.)
```

```
FREQ OVERWT
```

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

```
FREQ OVERWT PSUVAR=CLUSTER
```

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**Severe overweight analysis**

```
DEFINE SEVOVERWT NUMERIC
```

```
IF [WHZ-WHO] >3.000 AND EDEMA= "n"
```

```
THEN
```

```
    SEVOVERWT =1
```

```
ELSE
```

```
    SEVOVERWT =2
```

```
END
```

```
IF [WHZ-WHO] = (.) THEN
```

```
    SEVOVERWT = (.)
```

```
END
```

```
SELECT MONTHS>=6 AND MONTHS<60 AND Flag_WHZ_WHO = (.)
```

```
FREQ SEVOVERWT
```

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

```
FREQ SEVOVERWT PSUVAR=CLUSTER
```

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

### **Analysis by sex and overweight categories**

```
SELECT MONTHS>=6 AND MONTHS<60 AND Flag_WHZ_WHO = (.)
```

```
FREQ OVERWT SEOVERWT STRATAVAR = SEX
```

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

If you are analysing a cluster survey, you need to select the sex variable, use the C-Sample commands and the code is as follows:

```
SELECT MONTHS>=6 AND MONTHS<60 AND Flag_WHZ_WHO = (.) AND SEX = 'f'
```

```
FREQ OVERWT SEOVERWT PSUVAR = CLUSTER
```

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

```
SELECT MONTHS>=6 AND MONTHS<60 AND Flag_WHZ_WHO = (.) AND SEX = 'm'
```

```
FREQ OVERWT SEOVERWT PSUVAR = CLUSTER
```

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

### **Analysis by age and overweight categories**

#### **Age categories**

```
DEFINE AGEGROUP
```

```
RECODE MONTHS TO AGEGROUP
```

```
6 - 11.99 = 1
```

```
12 - 23.99 = 2
```

```
24 - 35.99 = 3
```

```
36 - 47.99 = 4
```

```
48 - 59.99 = 5
```

```
END
```

#### **Overweight analysis by age group**

```
SELECT Flag_WHZ_WHO = (.)
```

```
FREQ OVERWT SEOVERWT STRATAVAR = AGEGROUP
```

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

If you are analysing a cluster survey, you need to select each age group, use the C-Sample commands and the

code is as follows:

Overweight analysis in children aged 6-11 months

`SELECT AGEGROUP=1 AND Flag_WHZ_WHO = (.)`

`FREQ OVERWT SEOVERWT PSUVAR = CLUSTER`

`SELECT` (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

Overweight analysis in children aged 12-23 months

`SELECT AGEGROUP=2 AND Flag_WHZ_WHO = (.)`

`FREQ OVERWT SEOVERWT PSUVAR = CLUSTER`

`SELECT` (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

Overweight analysis in children aged 24-35 months

`SELECT AGEGROUP=3 AND Flag_WHZ_WHO = (.)`

`FREQ OVERWT SEOVERWT PSUVAR = CLUSTER`

`SELECT` (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

Overweight analysis in children aged 36-47 months

`SELECT AGEGROUP=4 AND Flag_WHZ_WHO = (.)`

`FREQ OVERWT SEOVERWT PSUVAR = CLUSTER`

`SELECT` (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

Overweight analysis in children aged 48-59 months

`SELECT AGEGROUP=5 AND Flag_WHZ_WHO = (.)`

`FREQ OVERWT SEOVERWT PSUVAR = CLUSTER`

`SELECT` (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

## WOMEN ANTHROPOMETRY (optional)

### WOMEN PHYSIOLOGICAL STATUS AND AGE

#### WOMEN PHYSIOLOGICAL STATUS AND AGE (OPTIONAL)

Physiological status	Number/total	% of sample
Non-pregnant, non-lactating		
Pregnant		
Lactating with an infant less than 6 months		
Lactating with an infant greater than 6 months		
Mean age in years [min, max] (all women)		

### MUAC IN WOMEN (OPTIONAL)

Below are the standard Epi Info codes to use for analysis.

Refer to the fictitious dataset available for practical purposes; Go to SENS Anthropometry and Health tool: [**Tool 6- WM Data**]; and see the Excel database PIL\_0618\_WM\_PILOT.



The practical Excel database PIL\_0618\_WM\_PILOT is from a SENS survey using *simple random sampling*.

## DATA REVIEW

### Ranges and codes

Run these commands (together or separately; regardless of the survey design) and make sure that the ranges and codes of the variables entered in the database match the standard questionnaire. This step can be omitted when using MDC surveys given that ranges and codes are pre-set, and that values outside of the pre-set ranges and codes cannot be entered during data collection.

#### FREQ WMCONST

For the below variables, only perform these checks on women having provided consent, i.e. **SELECT WMCONST=1**

MEANS WMAGE  
MEANS WMMUAC

FREQ PREGNANT  
FREQ LACTAT  
FREQ LACTATU6  
FREQ BSFP

**Missing data**

You should check the missing data in your database and make a note on this in the final SENS report. **Refer to the Data Review section for detailed instructions to follow with missing data.**

The commands below need to be run separately, one by one. After selecting the variable using the code shown below, use the LIST command to view the specific records with missing data. Then cancel the selected variable by typing SELECT and proceed with checking another variable.

**This step is important to do with MDC surveys as well as paper-based surveys.**

For the below variables, only perform these checks on women having provided consent, i.e. [SELECT WMCONST=1](#)

[SELECT WMAGE=\(.\)](#)

[SELECT](#) (this will cancel the selected variable)

[SELECT WMMUAC=\(.\)](#)

[SELECT PREGNANT=\(.\)](#)

[SELECT LACTAT=\(.\)](#)

[SELECT LACTATU6=\(.\)](#)

## DATA ANALYSIS

Results from the practical survey dataset are illustrated below.

### Women physiological status (optional)

#### WOMEN PHYSIOLOGICAL STATUS AND AGE (OPTIONAL)

Physiological status	Number/total	% of sample
Non-pregnant, non-lactating	122/279	43.7%
Pregnant	42/279	15.1%
Lactating with an infant less than 6 months	45/115	39.1%
Lactating with an infant greater than 6 months	70/115	60.9%
Mean age in years [min, max] (all women)	26.6 years [15-47]	

#### Percent of non-pregnant and non-lactating women

SELECT PREGNANT<>8 AND LACTAT<>8

DEFINE NONPREGLACT

IF PREGNANT=2 AND LACTAT=2 THEN

    NONPREGLACT="YES"

ELSE

    NONPREGLACT="NO"

END

FREQ NONPREGLACT

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ NONPREGLACT PSUVAR=CLUSTER

NONPREGLACT	Frequency	Percent	Cum. Percent	
NO	157	56,27%	56,27%	
YES	122	43,73%	100,00%	
Total	279	100,00%	100,00%	

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

***Percent of pregnant women***

SELECT PREGNANT<>8

FREQ PREGNANT

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ PREGNANT PSUVAR=CLUSTER

PREGNANT	Frequency	Percent	Cum. Percent	
1	42	15,05%	15,05%	
2	237	84,95%	100,00%	
<b>Total</b>	<b>279</b>	<b>100,00%</b>	<b>100,00%</b>	

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

***Percent of lactating women with an infant less than 6 months***

SELECT LACTAT=1 AND LACTATU6<>8

FREQ LACTATU6

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ LACTATU6 PSUVAR=CLUSTER

LACTATU6	Frequency	Percent	Cum. Percent	
1	45	39,13%	39,13%	
2	70	60,87%	100,00%	
<b>Total</b>	<b>115</b>	<b>100,00%</b>	<b>100,00%</b>	

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded)

***Percent of lactating women with an infant greater than 6 months***

SELECT LACTAT<>8

FREQ LACTATU6

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ LACTATU6 PSUVAR=CLUSTER

LACTATU6	Frequency	Percent	Cum. Percent	
1	45	39,13%	39,13%	
2	70	60,87%	100,00%	
<b>Total</b>	<b>115</b>	<b>100,00%</b>	<b>100,00%</b>	

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**Mean age of women**

**MEANS WMAGE**

Obs	Total	Mean	Variance	Std Dev
279,0000	7417,0000	26,5842	58,9992	7,6811
Minimum	25%	Median	75%	Maximum
15,0000	20,0000	26,0000	31,0000	47,0000
				Mode
				30,0000

**MUAC in women (optional)**

PREVALENCE OF MUAC MALNUTRITION IN NON-PREGNANT, NON-LACTATING WOMEN (ADAPT THE CUT-OFFS TO THE CONTEXT) (OPTIONAL – ONLY IF THERE ARE PARTICULAR CONCERNS ABOUT NUTRITION STATUS OF WOMEN)

	Number/total	% (95% CI)
Prevalence of MUAC < 230 mm	19/122	15.6% (9.6-23.3)

PREVALENCE OF MUAC MALNUTRITION IN PREGNANT WOMEN AND LACTATING WOMEN WITH AN INFANT LESS THAN 6 MONTHS (ADAPT THE CUT-OFFS TO THE CONTEXT) (OPTIONAL)

	Number/total	% (95% CI)
Prevalence of MUAC < 230 mm	7/87	8.1% (3.3-15.9)

**MUAC in non-pregnant, non-lactating women (optional)**

DEFINE WMMUAC\_c

RECODE WMMUAC TO WMMUAC\_c  
 LOVALUE – [INSERT VALUE] = “LOW MUAC”  
 [INSERT VALUE] - HIVALUE = “NORMAL”  
 END

SELECT PREGNANT=2 OR PREGNANT=8 (This is equivalent to SELECT PREGNANT<>1)

SELECT LACTAT=2 OR LACTAT=8 (This is equivalent to SELECT LACTAT<>1)

FREQ WMMUAC\_c

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ WMMUAC\_c PSUVAR=CLUSTER

WMMUAC_C	Frequency	Percent	Cum. Percent	
LOW MUAC	19	15,57%	15,57%	
NORMAL	103	84,43%	100,00%	
Total	122	100,00%	100,00%	

**Exact 95% Conf Limits**

LOW MUAC	9,64%	23,25%
NORMAL	76,75%	90,36%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**MUAC in pregnant women and lactating women with an infant less than 6 months (optional)**

DEFINE PLWMUAC

RECODE WMMUAC TO PLWMUAC  
 LOVALUE – [INSERT VALUE] = “LOW MUAC”  
 [INSERT VALUE] - HIVALUE = “NORMAL”  
 END

SELECT PREGNANT=1 OR LACTATU6=1

FREQ PLWMUAC

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

`FREQ PLWMUAC PSUVAR=CLUSTER`

PLWMUAC	Frequency	Percent	Cum. Percent	
LOW MUAC	7	8,05%	8,05%	
NORMAL	80	91,95%	100,00%	
Total	87	100,00%	100,00%	

**Exact 95% Conf Limits**

LOW MUAC	3,30%	15,88%
NORMAL	84,12%	96,70%

`SELECT` (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**Blanket supplementary feeding programme enrolment**

PROGRAMME ENROLMENT IN BLANKET SUPPLEMENTARY FEEDING (IF APPLICABLE)

	Number/total	% (95% CI)
Blanket feeding programme enrolment	68/87	78.2% (68.0-86.3)
Product name	Premix (CSB+)	
Target group	Pregnant and Lactating women with an infant under 6 months	

You need to select the target group used in your survey area for the BSFP (examples are shown below):

`SELECT PREGNANT=1 OR LACTATU6=1 AND WMBSFP <>8`  
`SELECT PREGNANT=1 AND WMBSFP <>8`

`FREQ WMBSFP`

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ WMBSFP PSUVAR=CLUSTER

WMBSFP	Frequency	Percent	Cum. Percent	
1	68	78,16%	78,16%	
2	19	21,84%	100,00%	
<b>Total</b>	<b>87</b>	<b>100,00%</b>	<b>100,00%</b>	

**Exact 95% Conf Limits**

1	68,02%	86,31%
2	13,69%	31,98%

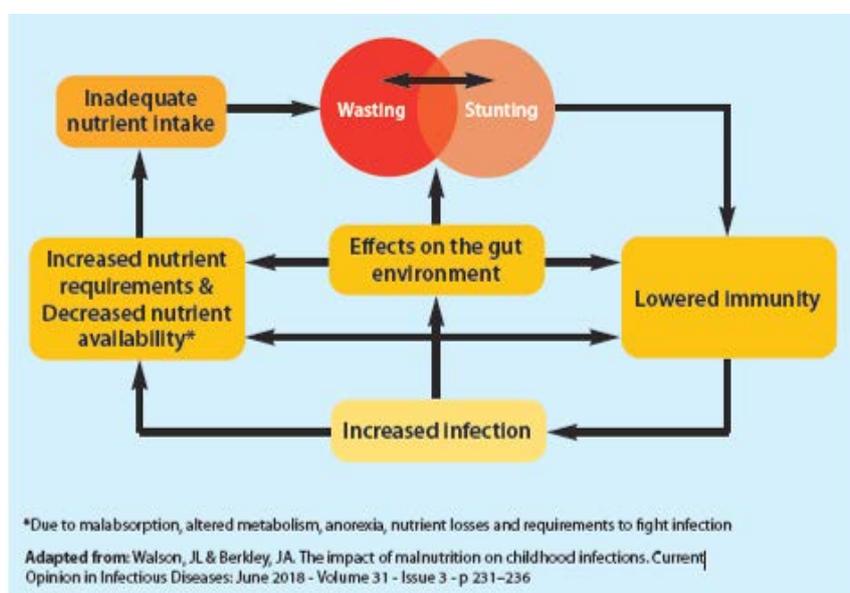
**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

## Annex 10 – WaSt (wasting and stunting) analysis

### Background<sup>5</sup>

- Wasting and stunting are common. They are implicated in the deaths of almost two million children each year and account for over 12% of disability-adjusted life years lost in young children.
- Wasting and stunting tend to be addressed as separate issues despite evidence of common causality and the fact that children may suffer simultaneously from both conditions (WaSt). The process underlying wasting and stunting involves multiple risk factors and interactions, which can change over time for example, involving poor diet and feeding practices, as well as episodes of infectious disease and environmental contamination.

**FIGURE 1** WASTING, STUNTING AND THE CYCLE OF INFECTION



- There is mounting evidence that a wasted child is more likely to become stunted and a stunted child is more likely to become wasted. The risk of death increases as a child becomes more wasted and the same is true of stunting. Children who are wasted and stunted at the same time (concurrently) have a multiplicative increased mortality risk.
- WaSt is largely a disease of younger children and of males.
- Routine reporting of the prevalence of WaSt should be encouraged.

<sup>5</sup> Sources:  
 Myatt *et al.* Children who are wasted and stunted are also underweight and have a high risk of death: a descriptive epidemiology of multiple anthropometric deficits using data from 51 countries. *Archives of Public Health* (2018) 76:28. <https://doi.org/10.1186/s13690-018-0277-1>  
 Wasting-Stunting Technical Interest Group (WaSt TIG). Child wasting and stunting: Time to overcome the separation. A briefing note for policy makers and programme implementers. ENN, June 2018.

**Wasting and stunting (optional)**

The instructions described below should be followed in Epi Info.

**PREVALENCE OF WASTING AND STUNTING BASED ON WEIGHT-FOR-HEIGHT CUT OFF'S AND HEIGHT-FOR-AGE CUT OFF'S AND BY SEX**

	<b>All</b> n = 483	<b>Boys</b> n = 253	<b>Girls</b> n = 230
<b>Prevalence of WaST (WHZ &lt;- 2 and HAZ&lt;-2)</b>	(12) 2.5% (1.4-4.3 95% CI)	(9) 3.6% (1.6-6.7 95% CI)	(3) 1.3% (0.3-3.8 95% CI)

**PREVALENCE OF WASTING AND STUNTING BASED ON WEIGHT-FOR-HEIGHT CUT OFF'S AND HEIGHT-FOR-AGE CUT OFF'S AND BY AGEGROUP**

	<b>All</b> n = 483	<b>6-23 months</b> n = 173	<b>24-59 months</b> n = 310
<b>Prevalence of WaST (WHZ &lt;- 2 and HAZ&lt;-2)</b>	(12) 2.5% (1.4-4.3 95% CI)	(7) 4.1% (1.6-8.2 95% CI)	(5)1.6 % (0.7-3.7 95% CI)

The best way to conduct this analysis is to export the anthropometric data from ENA to Excel. The WHZ flags and the HAZ flags (SMART flags) need to be excluded from the WHZ/HAZ analyses by using the following PGM codes:

DEFINE Flag\_WHZ\_WHO YN

```
IF [Flag-WHO] ="WHZ" THEN
    Flag_WHZ_WHO= (+)
END
```

```
IF [Flag-WHO] = "WAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

```
IF [Flag-WHO] = "HAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

```
IF [Flag-WHO] = "WAZ,HAZ,WHZ" THEN
    Flag_WHZ_WHO = (+)
END
```

DEFINE Flag\_HAZ\_WHO YN

```
IF [Flag-WHO] ="HAZ" THEN
    Flag_HAZ_WHO= (+)
```

```

END
IF [Flag-WHO] = "WAZ,HAZ" THEN
    Flag_HAZ_WHO = (+)
END

IF [Flag-WHO] = "WHZ,HAZ" THEN
    Flag_HAZ_WHO = (+)
END

IF [Flag-WHO] = "WAZ,HAZ,WHZ" THEN
    Flag_HAZ_WHO = (+)
END
    
```

***WaST analysis 6-59 months by sex***

```

DEFINE WAST NUMERIC

IF [WHZ-WHO] <-2.000 AND [HAZ-WHO] <-2.000 AND [HAZ-WHO] <-2.000
THEN
    WAST =1
ELSE
    WAST =2
END

IF [WHZ-WHO] = (.) THEN
    WAST = (.)
END

IF [HAZ-WHO] = (.) THEN
    WAST = (.)
END

SELECT MONTHS>=6 AND MONTHS<60 AND Flag_WHZ_WHO = (.) AND Flag_HAZ_WHO = (.)

FREQ WAST
    
```

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

```
FREQ WAST PSUVAR=CLUSTER
```

WAST	Frequency	Percent	Cum. Percent	
1	12	2.48%	2.48%	
2	471	97.52%	100.00%	
Total	483	100.00%	100.00%	

**Wilson 95% Conf Limits**

1	1.43%	4.29%
2	95.71%	98.57%

SELECT SEX="f"

FREQ WAST

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ WAST PSUVAR=CLUSTER

WAST	Frequency	Percent	Cum. Percent	
1	3	1.30%	1.30%	
2	227	98.70%	100.00%	
Total	230	100.00%	100.00%	

**Exact 95% Conf Limits**

1	0.27%	3.76%
2	96.24%	99.73%

SELECT (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

SELECT MONTHS>=6 AND MONTHS<60 AND Flag\_WHZ\_WHO = (.) AND Flag\_HAZ\_WHO = (.) AND SEX="m"

FREQ WAST

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ WAST PSUVAR=CLUSTER

WAST	Frequency	Percent	Cum. Percent	
1	9	3.56%	3.56%	
2	244	96.44%	100.00%	
Total	253	100.00%	100.00%	

**Exact 95% Conf Limits**

1	1.64%	6.65%
2	93.35%	98.36%

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

**WaST analysis by age group**

Use the newly generated variable 'WAST' defined above to conduct the following analysis.

DEFINE AGEGROUP

RECODE MONTHS TO AGEGROUP

6 - 23.99 = 1

24 - 59.99 = 2

END

SELECT MONTHS>=6 AND MONTHS<60 AND Flag\_WHZ\_WHO = (.) AND Flag\_HAZ\_WHO = (.)

FREQ WAST

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ WAST PSUVAR=CLUSTER

SELECT AGEGROUP=1

FREQ WAST

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ WAST PSUVAR=CLUSTER

WAST	Frequency	Percent	Cum. Percent	
1	7	4.05%	4.05%	
2	166	95.95%	100.00%	
Total	173	100.00%	100.00%	

**Exact 95% Conf Limits**

1	1.64%	8.16%
2	91.84%	98.36%

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

SELECT MONTHS>=6 AND MONTHS<60 AND Flag\_WHZ\_WHO = (.) AND Flag\_HAZ\_WHO = (.) AND AGEGROUP=2

FREQ WAST

If you are analysing a cluster survey, you need to use the C-Sample commands and the code is as follows:

FREQ WAST PSUVAR=CLUSTER

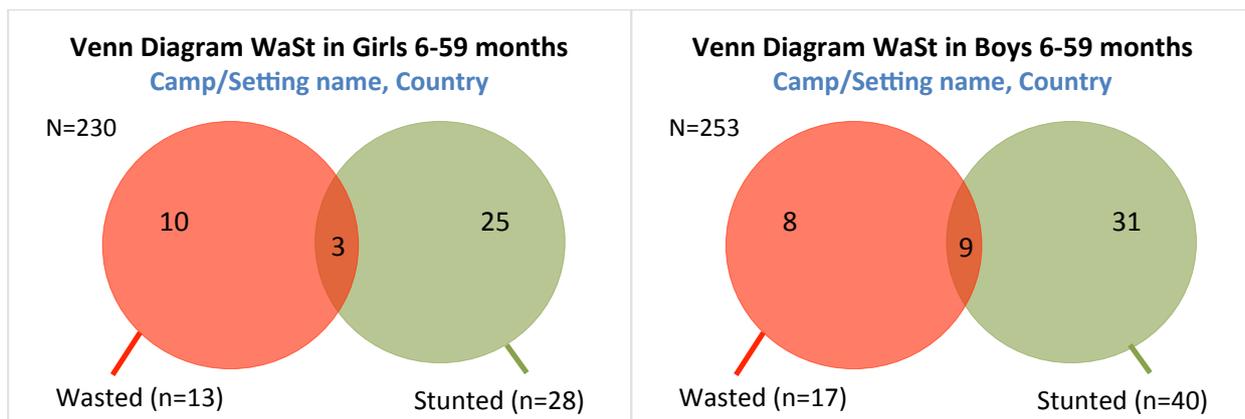
WAST	Frequency	Percent	Cum. Percent	
1	5	1.61%	1.61%	
2	305	98.39%	100.00%	
Total	310	100.00%	100.00%	

**Wilson 95% Conf Limits**

1	0.69%	3.72%
2	96.28%	99.31%

**SELECT** (this will cancel the selected variable(s); only to be executed after the analysis is done and the results recorded).

***Venn Diagram Wasting and Stunting by sex***



SELECT MONTHS>=6 AND MONTHS<60 AND Flag\_WHZ\_WHO = (.) AND Flag\_HAZ\_WHO = (.) AND [WHZ-WHO] <-2.000 AND [HAZ-WHO] >=-2.000

FREQ SEX

SEX	Frequency	Percent	Cum. Percent
f	13	43.33%	43.33%
m	17	56.67%	100.00%
Total	30	100.00%	100.00%

SELECT

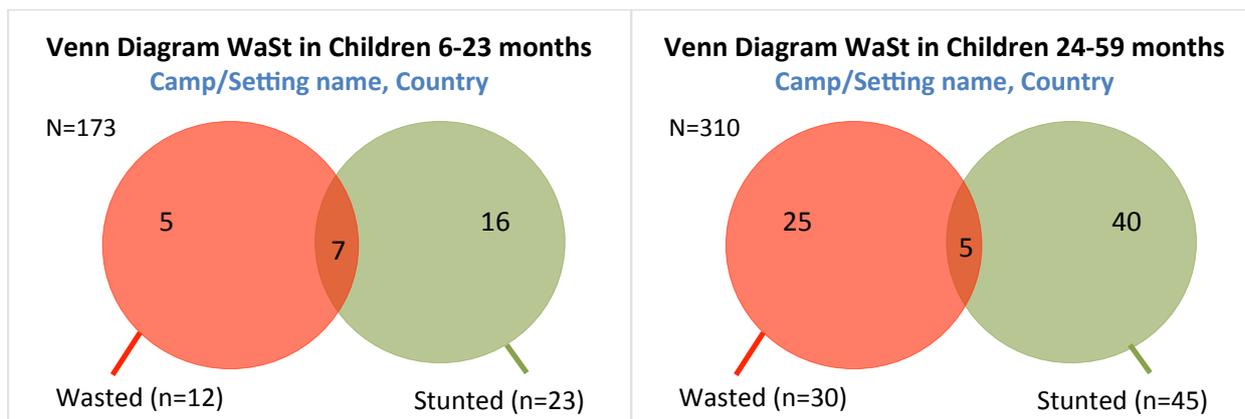
SELECT MONTHS>=6 AND MONTHS<60 AND Flag\_WHZ\_WHO = (.) AND Flag\_HAZ\_WHO = (.) AND [HAZ-WHO] <-2.000 AND [WHZ-WHO] >=-2.000

FREQ SEX

SEX	Frequency	Percent	Cum. Percent
f	28	41.18%	41.18%
m	40	58.82%	100.00%
Total	68	100.00%	100.00%

SELECT

***Venn Diagram Wasting and Stunting by age group***



SELECT MONTHS>=6 AND MONTHS<60 AND Flag\_WHZ\_WHO = (.) AND Flag\_HAZ\_WHO = (.) AND [WHZ-WHO] <-2.000 AND [HAZ-WHO] >=-2.000

FREQ AGEGROUP

AGEGROUP	Frequency	Percent	Cum. Percent	
1	12	28.57%	28.57%	
2	30	71.43%	100.00%	
Total	42	100.00%	100.00%	

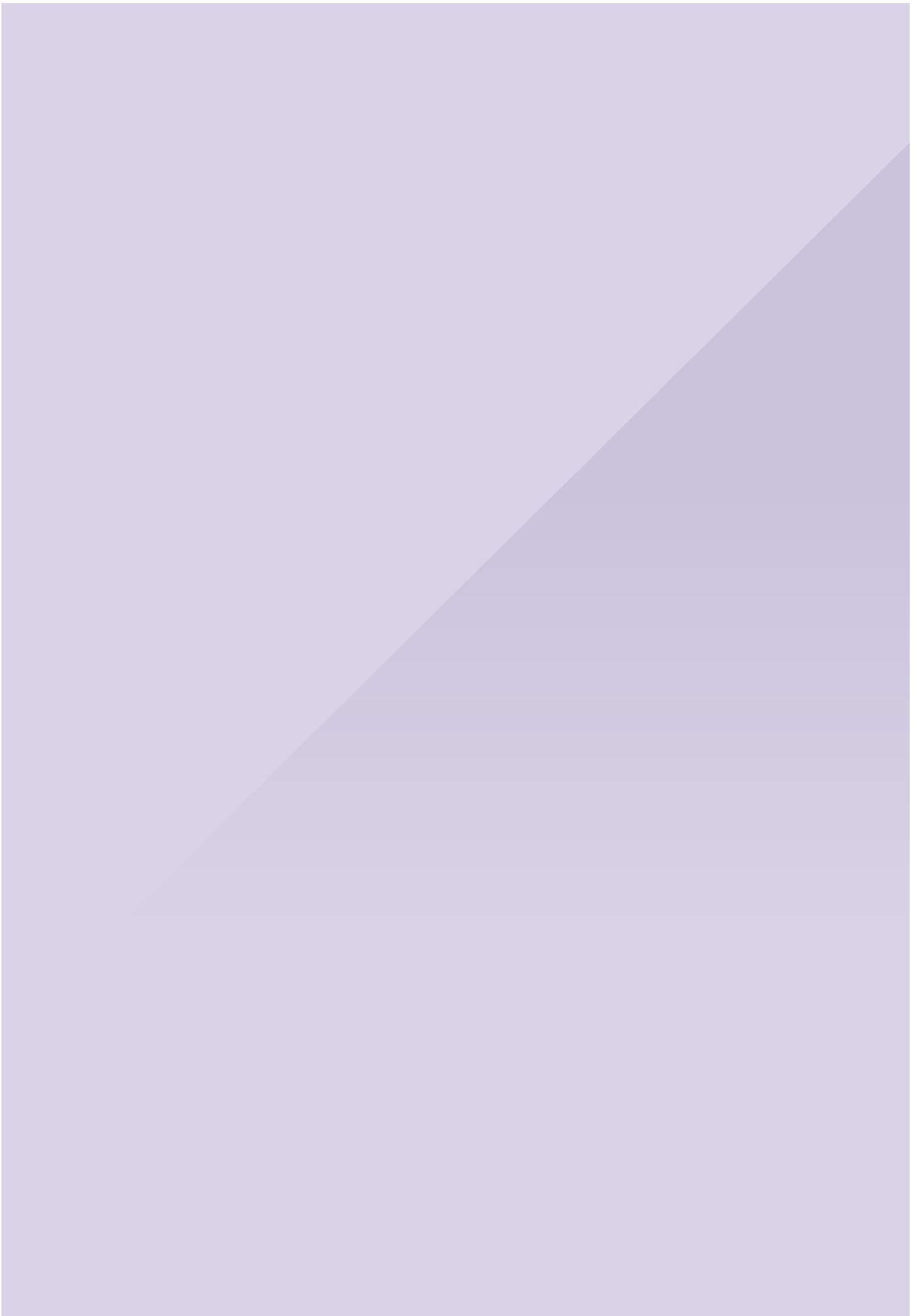
SELECT

SELECT MONTHS>=6 AND MONTHS<60 AND Flag\_WHZ\_WHO = (.) AND Flag\_HAZ\_WHO = (.) AND [HAZ-WHO] <-2.000 AND [WHZ-WHO] >=-2.000

FREQ AGEGROUP

AGEGROUP	Frequency	Percent	Cum. Percent	
1	23	33.82%	33.82%	
2	45	66.18%	100.00%	
Total	68	100.00%	100.00%	

SELECT



UNHCR  
STANDARDISED EXPANDED  
NUTRITION SURVEY (SENS) GUIDELINES  
FOR REFUGEE POPULATIONS

**MODULE 2:**  
**ANTHROPOMETRY AND HEALTH**