



No. 2.2 Interpreting Acute Malnutrition in Emergencies

What are the metrics of malnutrition?

The recommended body measurements (**anthropometric measurements**) for assessing nutritional status are weight, height and mid-upper-arm circumference (MUAC). Malnutrition is measured in children 6–59 months, comparing measurements to reference values.

A **nutritional index** (two combined anthropometric measurements) compares a child's measurements with the expected value of a child of the same age from a reference population.

Nutritional bilateral oedema is another nutritional indicator for determining the presence of a type of severe acute malnutrition named *Kwashiorkor*. All children with nutritional oedema are automatically classified as severely malnourished.

The nutritional status analysed for individual children is further classified using **cut-off points** for identifying those who are malnourished at different grades (normal, moderate, severe and global malnutrition).

The World Health Organization (WHO) has recommended the use of a single reference standard, based on data from the US National Centre for Health Statistics (NCHS). Guidelines are being drafted on the roll out process and use of the new standards, but current advice is that when using both references, quote the NCHS standard.



Fig. 1: A baby is assessed for malnutrition in Ethiopia (Credit: Nick Danziger/OXFAM)

How is malnutrition prevalence analysed and presented?

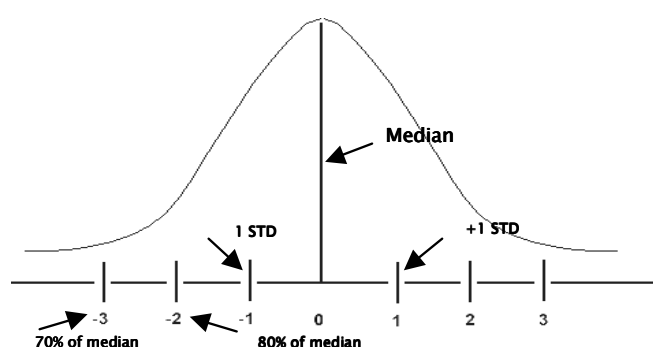
Table 1 indicates the nutritional indices commonly used for assessing malnutrition. In the reference population, anthropometric measurements follow a normal distribution around the middle (the mean or median of the *Curve of Gauss*, Fig. 2). In the assessed group, a child with anthropometric measurements equal to the median of the reference data would be classed as optimally nourished. A child in the assessed group above or below the median would be classed as over- or underweight, respectively.

Table 1: Nutrition indices and their characteristics

Nutritional index	Characteristics
Weight for height (WFH)	<ul style="list-style-type: none"> Best indicator of wasting (acute malnutrition) Useful as selection criteria for selective feeding programmes Relatively independent of a child's age
Height for age (HFA)	<ul style="list-style-type: none"> Best indicator of stunting (chronic malnutrition) Manifests over longer time-scale, so useful for long-term programming and policy planning
Weight for age (WFA)	<ul style="list-style-type: none"> Reflects either wasting or stunting or a combination of the two (indicates underweight) Used for individual growth monitoring
Mid-upper arm circumference (MUAC)	<ul style="list-style-type: none"> Measures acute malnutrition in children 12–59 months Good predictor of immediate risk of death Useful in assessing need for therapeutic feeding and/or a proper nutritional survey <p><i>Note: WHO recommends using references to analyse MUAC—for Age or MUAC—for-Height index. Also, there is poor overlap between malnutrition by low MUAC and low WFH (thus the two should be used together)</i></p>
Body mass index (BMI)	<ul style="list-style-type: none"> Used for assessing nutritional status in older children and adults BMI = weight (kg)/height (m)

The two main methods² for analysing a child's nutritional indices against reference values are:

1. **Percentage of the reference median:** expresses the child's measurements as a percentage of the expected value in the reference population; and,
2. **Z-scores:** express the distance between a child's value for a specific nutritional index, and the expected value of the same index in the reference population (in multiples of the standard deviation from the median, STD).



Metric	Value (or oedema)		
	Global	Moderate	Severe
Z-score	<-2	-2 to -3	<-3
% of median	<80	70-80	<70
MUAC (cm)	>12.5	11.0-12.5	<11.0

Fig. 2: Curve of Gausse (above) and cut-off points used to assess acute malnutrition

Nutritional status is classified using cut-off points that grade child malnutrition as moderate or severe in children 6 – 59 months (there are no such cut-offs for infants under 6 months). The box in Figure 2 shows various cut off points for moderate and severe malnutrition on Z-scores, percentage of median and MUAC (cm). Malnutrition prevalence is then determined as an aggregate of all individual cases of childhood malnutrition, expressed as a percentage of the assessed population below the agreed cut-off points. Where possible, prevalence should be presented separately for children under two years and those over two years.

The **severity of acute malnutrition prevalence** is usually assessed against WHO thresholds. When doing this, only global acute malnutrition is considered. The use of

absolute thresholds to judge malnutrition severity has been rejected by the Sphere Project, which instead recommends examining trends. For instance, practitioners can instead estimate whether the acute malnutrition prevalence is unusual for the time of the year or the specific context, on the basis of a review of nutritional risks related to food, health and care. Thus, **prevalence thresholds should be seen as a starting point for interpretation**, rather than the sole basis for interpreting malnutrition in emergencies.

Malnutrition rates on their own or compared to thresholds mean little, unless trends and underlying causes in each context are understood.

Table 2. Assessing the acute malnutrition situation in populations

Category	Low (Acceptable)	Medium (Poor)	High (Serious)	Very High (Critical)
% global acute malnutrition prevalence	<5.0	5.0-9.9	10.0-14.9	>15.0

SOURCE: WHO

How are nutrition survey results interpreted?

Table 3 shows critical questions that must be asked when interpreting malnutrition prevalence rates. To be properly understood and interpreted, nutritional data should take into account: prevalence of acute malnutrition in relation to **trends and thresholds**; **seasonality**; relative importance of different **underlying causes** (i.e., food, health and familial/social care); and, **relationship between malnutrition and mortality**.

How are nutrition situations categorised?

Nutritional risk or food security phase classification systems can help standardise interpretations of 'food insecurity', a 'food crisis', a 'health crisis' or 'famine', and how to promote an appropriate and impartial humanitarian response. All systems give thresholds for different indicators, including prevalence of malnutrition, and grade the situation according to combined analyses of these. Better use of these systems will focus on the convergence of multiple lines of evidence, rather than the strict application of indicators crossing thresholds.³

Current classification systems include the Integrated Food Security Phase Classification (IPC). Oxfam is supporting the development of the IPC system (see Rough Guide 1.4 IPC). Some partners of the IPC's work have been developing an alternative nutrition classification tool to fit into the IPC. This "Nutrition Situation Categorisation Estimates" tool is moving away from single indicators, towards categorising the nutrition situation based on multiple indicators.

Table 3: Important considerations when interpreting malnutrition prevalence

Question	What to look for
Does acute malnutrition prevalence exceed emergency thresholds ?	<ul style="list-style-type: none"> Rates of malnutrition on their own or compared to thresholds mean little. Trends should be examined on the basis of a review of nutritional risks related to food, health and care
Seasonality: How does prevalence compare with usual prevalence at this time of year, and previous years?	<ul style="list-style-type: none"> A prevalence of malnutrition which is unusual for the time of the year indicates a serious situation Continuously high levels of acute malnutrition
Causes: <ul style="list-style-type: none"> Is the most important cause likely to be food insecurity, disease/poor health environment or constraints on caring behaviours? How are malnutrition and mortality related? 	<ul style="list-style-type: none"> Underlying causes were considered in the assessment If food security is the main cause, analysis shows: low mortality, shift in frequency distribution curve to the left, increased prevalence of malnutrition in children >2 years Health crisis can be indicated by high mortality, low malnutrition Failure in all underlying causes at a time is likely to lead to famine Mortality increases exponentially with declining nutritional status in any population. This has implications for tracking the rate of progression from food insecurity to a famine, as 'hotspots' may appear unexpectedly
Demographics: Have population movements or migration impacted results?	<ul style="list-style-type: none"> Migration situation. Nutrition statistics of those who leave and those who remain behind or at place of origin and host area.

How do acute malnutrition interventions link to other humanitarian programmes?

There are potential links between interventions targeting acute malnutrition interventions and those for **public health education (PHE)** and **public health promotion (PHP)**, and **food security**. For example:

- PHE/PHP—High rates of diarrhoea or malaria may result in increased malnutrition prevalence. Water shortages are likely to impact hygiene and therefore expose children to higher risks of infections
- Food security—information relating to accessibility and availability of food to the household, market prices and terms of trade, are all necessary for understanding and interpreting malnutrition.

Where can I find further reading and more detailed information?

Oxfam publications—Nutrition Rough Guides <ul style="list-style-type: none"> 2.1 Understanding Malnutrition 2.3 Feeding Programmes in Emergencies 2.4 Micronutrient Deficiencies 2.5 Nutrition Surveys 	The Sphere Project 2004. <i>Humanitarian Charter and Minimum Standards in Disaster Response</i> . (Chapter 3) www.sphereproject.org
Emergency Nutrition Network (including emergency nutrition training materials, policy guidance, research): www.enonline.net	IPC maps, publications, workshop bookings and other resources www.ipcinfo.org

Who can I contact for more information and guidance?

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References

- ACF 2002. *Assessment and treatment of malnutrition in emergency situations*. Manual of Therapeutic Care and Planning for a Nutritional Programme.
- World Food Program 2000. *Food and Nutrition Handbook*.
- Young, H. and S. Jaspars 2006. *The meaning and measurement of acute malnutrition in emergencies. A primer for decision-makers*. HPN. Working Paper Number 56.
- WHO 2000. *The Management of Nutrition in Major Emergencies*. Geneva: WHO, UNHCR, IFRC, WFP.
- FAO 2003. *Protecting and Promoting Good Nutrition in Crisis Situations*.
- SPHERE Project 2004. *Humanitarian Charter and Minimum Standards in Disaster Response*.
- WHO 2000. *The Management of Nutrition in Major Emergencies*. Geneva.
- UNHCR et al. 2002. *Food and Nutrition Needs in Emergencies*. Geneva.