

Sizing up the Situation: Anthropometric Indicators

The word 'anthropometric' sounds rather important and technical. It is actually made up of two words: *anthropos*, which means 'human'; and *metric*, which means 'measure.' So, quite simply, anthropometric means 'measuring people.' In nutritional studies, this generally means measuring people's weight and height.

Reference Population

We know that people who are not eating enough food will become thin and lose weight. Likewise, if growing children go without sufficient food for long enough, they may not be as tall as other children their age. However, children

come in all different sizes. How can we know when a child is starting to get too thin, or is not growing as well as they could be? It is easier to make these decisions when there are healthy children to compare with. The WHO provides a 'Road to Health' chart that gives the height and weight of healthy

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- stunting
- wasting
- body mass index (BMI)
- underweight
- arm circumference

children at all ages of growth (called a 'reference population'). These healthy children have been used to compare the growth and health of children around the world. When a girl or boy starts to fall far below the height or weight of other healthy girls or boys of the same age, she or he might be sick or malnourished.

The following indicators are commonly used to compare children to a healthy reference population. The indicators might be used to identify individual girls and boys that are at risk of malnutrition and to monitor their progress in a feeding program. The indicators may also be used to identify and monitor whole communities where there are many malnourished people. Food assistance may help to reduce the number of malnourished people in those communities.

1. Stunting

Children who lack food for extended periods of time grow more slowly than other children their age. This is known as stunting -- when children are shorter than expected for their age. Each child's height is compared to the median (middle value) height for healthy, well-fed children of the same age. This is known as 'height-for-age.' Children who are less than 95% of the median height for their age are considered stunted. Height-for-age less than 85% of the median indicates severe stunting.

It is important to remember that not all small children are malnourished. Some children are naturally small. The

WHO reference population is based on well-fed American children. In many parts of the world, it may not be appropriate to compare a child's height to that of an American child. Some people are naturally taller than Americans and some are naturally shorter, regardless of how well they eat. A new, more global reference is being developed.

Children who do not get enough to eat during their first two years of life may never reach full height, even if they eat enough food for the rest of their lives. Thus, there could be a high number of stunted children in the population due to past food shortage, even if the current situation is fine. Likewise, if the current situation suddenly gets worse, it will take a long time before stunting is noticed.

In some cases, it may be a challenge to find out children's ages. There are some creative ways of estimating children's ages, including local events charts and age charts. More information on these tools is available from the Foodgrains Bank.

2. Wasting

People who have lost weight as a result of food shortage are said to be wasting. Specifically, wasting is measured as a child's weight divided by his or her height. As with the stunting measures, children's weight-for-height measures are compared with a reference population. Each child's weight-for-height is described as a percentage of the median for the reference population. Wasting is a weight-for-height less than 80% of the reference. Weight-for-height less than 70% of the reference population is considered severe wasting. Typically, 5-10% of children in many African communities show signs of wasting. Wasting among 20% or more is considered high, and anything over 40% is a major crisis. Any amount of severe wasting is cause for concern.

Wasting is much more sensitive to sudden changes in the food situation. It is not long before children start to lose weight if they are not eating properly. However, for this reason it is also quite sensitive to seasonal changes in food availability. When doing comparisons of wasting measures, it is very important to consider these seasonal changes in nutritional status.

3. Body Mass Index (BMI)

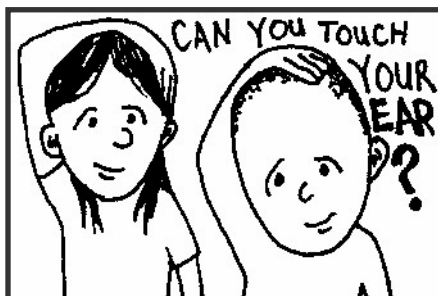
The body mass index (BMI) is another weight-for-height measure. However, BMI is calculated as $\text{weight}/\text{height}^2$. This measure is one of the only anthropometric measures used for adults. People with BMI less than $17 \text{ kg}/\text{m}^2$ may be more likely to get sick. BMI between 16 and $18\frac{1}{2} \text{ kg}/\text{m}^2$ indicates mild-to-moderate malnutrition. BMI less than $16 \text{ kg}/\text{m}^2$ indicates severe malnutrition.

Like wasting, BMI can be affected by different body types (especially noticeable in adults).

4. Underweight

While stunting is defined as a low height compared to children of the same age, underweight is a low *weight* compared to children of the same age. Children with weights less than 80% of the median for a reference population are considered mild-to-moderately malnourished. Children with weights less than 60% of the median are considered severely malnourished.

Weight-for-age reflects stunting and wasting together. If a child is stunted, he or she will weigh less than other children his or her age, even if he or she is not wasting. Thus, this measure can be confusing as it reflects both long-term or past malnutrition (the cause of stunting) as well as short-term and current malnutrition (the cause of wasting).



5. Mid-Upper Arm Circumference (MUAC)

Although children grow a lot between age one and five, the size of their upper arm changes very little. This means that, in general, changes in the size of a child's upper arm are due to changes in their nutritional status. Children who are not well-nourished will usually have thinner upper arms than well-fed children. The arm circumference is measured by wrapping a measuring tape around the child's arm, half way between the elbow and the shoulder. UNICEF recommends using a special 'insertion tape,' which has a special slot to help health workers to make accurate measurements of the arm circumference. Children with an arm circumference less than 13.5 cm are considered mild-to-moderately malnourished. Arm circumferences less than 12.5 cm indicate severe malnutrition.

MUAC is often used in emergency situations to help aid workers quickly identify children who need feeding. The measure cannot be used for children over the age of five. In areas where people are not sure of children's ages, there is a simple trick that helps identify children under five. Ask children to reach their right arm over the top of their head and touch their left ear. If they can do this, they are most likely older than five.

Getting the Data

One advantage of these indicators is that heights, weights and arm circumference are relatively easy to measure. It does not take long to train people to take these measurements, if they are appropriate to the program. In some cases, local clinics, government agencies, or NGOs may already have data from community surveys or

ongoing monitoring. As with any measure, the methods must be locally appropriate. For example, one group in Malawi ran into difficulties because the box they were using to measure the length of infants resembled local coffins!

Limitations

Each measure has strengths and limitations that are important to note before choosing which indicator(s) to use. Most anthropometric indicators are used with children. This is a limitation as sometimes the biggest effect of food shortage may be among adults, especially if the adults (mainly women) are giving up their own food to make sure that their children are able to eat enough. It is also important to

remember that not all of the energy provided by food is used for growth and development. Much of the energy is used for activities such as labour, chores, and play. One study even suggested that as little as 15% of the energy provided to a child by food distribution will actually go toward that child's growth. The rest is eaten by other people or is used in activity. Changes in activity levels may be a very important impact of food assistance. However, activity levels are more difficult to measure than heights and weights. Thus, while anthropometric indicators provide important information on growth and development, they do not tell the whole story of malnutrition in a community.

Resources

FAO (1990) Conducting small-scale nutrition surveys -- A Field Manual. *Nutrition planning, assessment and evaluation service, Food policy and nutrition division, Rome.*

FANTA. Anthropometric Indicators Measurement Guide: www.fantaproject.org/publications/anthropom.shtml

Gibson RS (1990) Principles of Nutritional Assessment. Oxford University Press.

IFAD: Practical Anthropometry 101 and 102:

www.ifad.org/gender/tools/hfs/anthropometry/ant_toc.htm

World Vision Canada, Design and Implementation of Nutrition Surveys, an excerpt from the MICAH Guide. Download a copy in Word format from: www.foodaidmanagement.org/mne3.htm

For more information on anthropometric indicators or any other planning, monitoring, and evaluation issues, contact the Canadian Foodgrains Bank at the address below, or email inquiries to cfgb@foodgrainsbank.ca