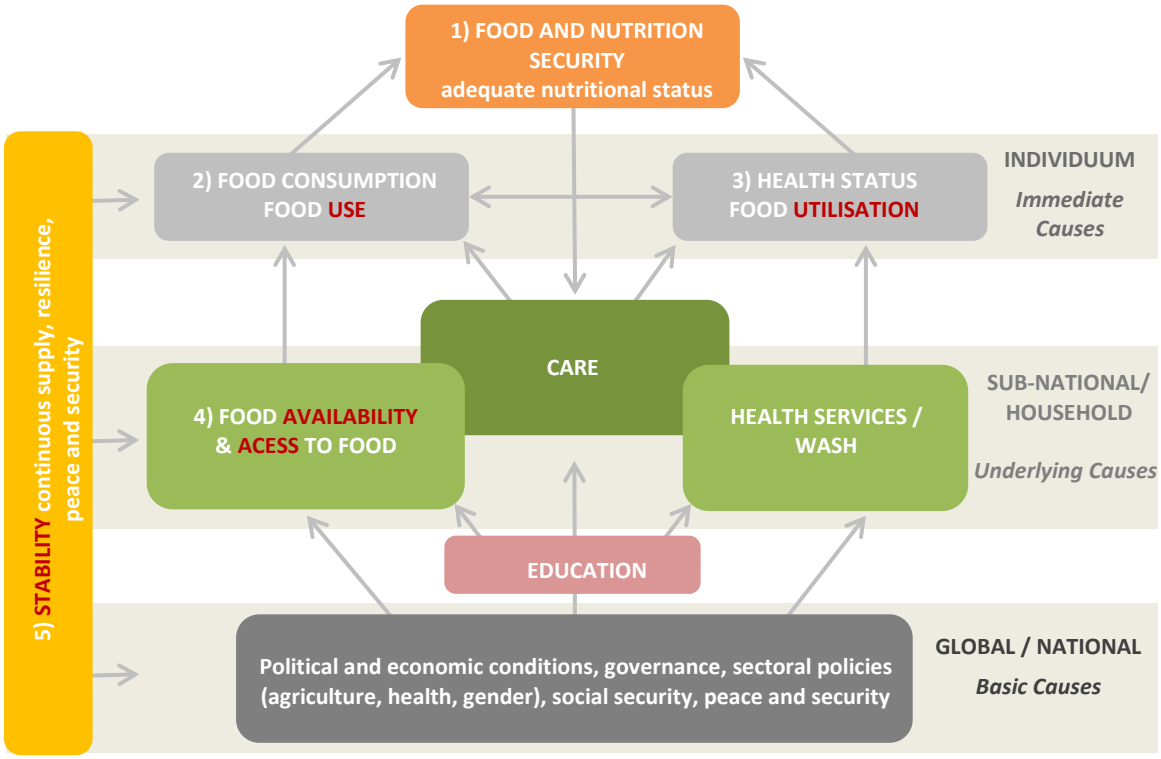
Proving and improving the effectiveness of food and nutrition security interventions

The effects of food security interventions can be measured. Different indicators and methods are appropriate depending on which of the four dimensions of food security (availability, access, food use and utilisation, stability of supply) is being targeted and how objectives of these interventions are defined.

In the following overview the main focus will be on measurements at the individual (nutritional status, food use and utilisation) and household level (availability of & access to food).

Figure 1: Dimensions of food security against which the effectiveness of interventions can be measured, based on UNICEF (1991)



Individual Level

1) Food and nutrition security (nutritional status)

The nutritional status can be measured using specific indicators. These can be measurements on the body (anthropometry, Table 1) as well as biochemical or clinical examinations. In order to assess the severity of individual deficiency symptoms, experts apply internationally recognised thresholds at both individual and population level. There are indicators for babies (e.g. birth weight), infants and adults (e.g. body mass index), see Table 1.

According to the guidelines of the World Health Organization (WHO), for example, infants whose weight-for-height/length ratio is less than 3 standard deviations (SD) from the WHO Child Growth Standards median are regarded as severely wasted[1]. Infants whose weight- for-height/length ratio is less than 2, but equal to or above 3 standard deviations are considered moderately wasted. Although these indicators

[1] The standard deviation is a measure of the deviation of the values from the mean value.

are collected at the individual level, they also reflect the overall nutritional situation of a society or group. If less than five percent of children under 5 suffer from wasting or overweight, this is classified as very low or low on the WHO/UNICEF scale[2]. Over 10 percent is considered high, over 15 percent very high. These thresholds are higher for stunting, i.e. if more than 20 percent of infants are affected this is considered as a high prevalence and if over 30 percent are affected stunting is considered to be very high.

In addition to these anthropometric indicators, biochemical (e.g. vitamin A levels in serum) or clinical indicators (e.g. night blindness in the case of vitamin A deficiency) are used to identify micronutrient deficiencies. Vitamin A, iron, iodine and zinc deficiencies are the most common globally. Folic acid deficiencies play a particularly important role during pregnancy, as they can lead to malformations in the child. These indicators are applied at both individual and population level, in the form of prevalence rates.

Table 1: Cut-off Points for the Most Relevant Indicators to Classify Malnutrition in Children and Adults

Index	Description / Application	Individual Level Thresholds – Cut-off Points
Infants		
Birth weight	Indicator for future health and nutritional status of a child and the health and nutritional status of mothers	<2.5 kg = low birth weight
Children < 5 years		
Weight-for-Height/Length	Indicator for acute malnutrition / wasting Application: nutrition assessments in emergencies; selection criteria for selective nutritional programmes	<-2SD = moderate wasting <-3SD = severe wasting >+2SD = overweight
Height/Length-for-Age	Indicator for chronic malnutrition / growth retardation (stunting)	<-2SD = moderate stunting <-3SD = severe stunting
Weight-for-Age	Indicator for underweight, composed indicator reflecting stunting and wasting Indicator MDG 1 (Prevalence of underweight)	<-2SD = moderate underweight <-3SD = severe underweight
Mid-upper arm circumference	Indicator for moderate and severe acute malnutrition	110-125mm = moderate malnutrition <110mm = severe malnutrition
Adults		
Body-Mass-Index	Indicator for malnutrition of young people and adults	<16.0 = severe underweight <17.0 = moderate undeweight <18.5 = underweight 18.5–24.9 = normal weight ≥25.0 = overweight ≥ 30.0 = obesity

2) Food consumption (Food Use)

The following indicators provide information on the food intake and/or micronutrient supply:

- number of meals per person and day
- consumption of iodised table salt
- vitamin A supplementation (children aged between 6 months and 5 years)

More complex indicators for measuring food intake at the individual level are:

The ***Individual Dietary Diversity Score (IDDS)*** is a proxy indicator for the diet quality of individuals or nutrient adequacy. All foods consumed over the preceding 24 hours are classified into food groups. The number of food groups consumed provides information on the quality of the diet.

Women of reproductive age (15-49 years):

- The ***Minimum Dietary Diversity Indicator for Women of reproductive age (MDD-W)*** determines the proportion of women who consume at least 5 out of 10 defined food groups. The micronutrient intake of these women is considered sufficient; i.e. the quality of their diet is good.

Infants and young children (6-23 months):

- ***Minimum Dietary Diversity (MDD):*** The indicator determines the number of children consuming at least 4 out of 7 defined food groups.
- The ***Minimum Meal Frequency (MMF)*** indicator measures the number of children

[2] An overview of the 2018 revised thresholds and the new methodology can be found here.

who eat the minimum number of meals a child needs, taking into account the age and breastfeeding status of the child.

- The ***Minimum Acceptable Diet (MAD)*** indicator is a combination of the two previous ones - *Minimum Dietary Diversity* and *Minimum Meal Frequency*. It measures whether children between 6-23 months of age, have sufficient food (quality and quantity), apart from breast milk.

3) Health Status (Food Utilisation)

The health status and especially the occurrence of acute infectious diseases determine how the body utilises food. If the objective (of an intervention) is to improve food utilisation, information on the spread of infectious diseases, which are closely linked to food insecurity, is important.

Indicators for assessing the health status of children include the prevalence of:

- acute respiratory diseases
- diarrhoea
- malaria
- the measles

Indicators are determined through household interviews. Data from health care facilities are only of limited value, since only the cases under medical treatment are being recorded.

Level: Sub-National

4) Household and Community Access to Food and Food Availability

If access to food or food availability is to be improved, this can be measured or calculated using the following indicators.

Access to Food

- The ***Household Dietary Diversity Score*** (HDDS) serves as a proxy indicator for the socio-economic situation of households and thus their access to food. Calculation of the HDDS is based on 12 food groups.
- The ***Months of Adequate Household Food Provisioning (MAHFP***) indicator determines both the number of months and the exact months in which households surveyed had limited or insufficient access to food. The relevant data should be collected during the period of greatest food shortages, i.e. shortly before the harvest.
- The ***Coping Strategies Index (CSI)*** assesses the state of food insecurity at the household level, analysing household coping strategies in situations of limited food access. The response options that are adapted to the local context, all respond to the question: "What do you do when you don't have adequate food, and don't have the money to buy food?" The higher the CSI value, the higher the food insecurity.
- The ***Food Consumption Score (FCS)*** is a weighted proxy indicator of food security at the household level and is based on three components: food diversity (quality), frequency of food consumption (quantity) and nutritional value of food. Eight food groups consumed over the last seven days are taken into consideration.
- The ***Food Insecurity Experience Scale*** (FIES), developed by the FAO, is an experience-based indicator of the severity of food insecurity. It is based on the direct answers to eight questions about people's access to adequate food (e.g. the existing concern about the next meal, the need to limit the quality or quantity of meals due to a lack of resources). Individuals and households are grouped according to the level of their food insecurity (mild, moderate, severe food insecurity). Since the FIES and other experience-based indicators do not include the amount, quality and expenditure of consumed food, they should be used in combination with other indicators. The FIES indicator is part of the global SDG monitoring and measures progress towards the SDG target 2.1.: severity of food insecurity.

Food Availability

- ***Food Balance Sheets*** provide information on the average availability of calories, protein and fat per capita and day. Food availability is determined at the country level by calculating food balance sheets, which provide information on which foodstuffs are available and which are used. The FAO developed a standard method for Food Balance Sheets. Based on the data calculated using this method, and based on studies on household food consumption, FAO experts determine the number of "hungry" people each year.

Monitoring and impact evaluation

In addition to the indicators mentioned above, further relevant and appropriate indicators should be identified in impact assessments. The chosen indicators should allow conclusion on the factors that influenced the success of the intervention: food production for subsistence, income, food prices, hygiene and health behaviour, access to and use of health services, drinking water and sanitation. The lack of technical and institutional capacity in the areas of monitoring and evaluation, needs assessment (surveys), development and implementation of interventions, and support at operational and management level is a significant obstacle in many developing countries. There is often a lack of qualified personnel at national, district, municipal and local levels. Therefore, capacity building should be given a high priority and adequate financial resources should be made available for monitoring and capacity building activities.

5) Stability

With regards to stability, FAO distinguishes between vulnerability and shocks. Various indicators can be used to measure stability (e.g. Cereal import dependency ratio). Further information can be found here.

Tackling health problems related to micronutrient deficiencies in school children in Indonesia

With the aim of alleviating micronutrient deficiencies and improving cognitive performance, the World Food Programme (WFP) provided fortified biscuits for primary school students in selected districts of Indonesia between 2004 and 2007. The biscuits were enriched with 9 vitamins (A, B1, B2, B2, B6, B12, Niacin, folic acid, D and E) and 5 minerals (calcium, iron, zinc, selenium and iodine).

In order to measure the impact of the intervention, a cross-sectional baseline survey was carried out in rural and urban areas of the country. The health and nutritional status and cognitive abilities of the students were examined. For all children, weight and height, haemoglobin status and general health status were determined. Furthermore, 20% of the students were additionally tested for parasitic infections and cognitive performance as well as serum retinol and ferritin testing. Finally, they were questioned about their consumption on the previous day in a 24-hour dietary recall protocol.

Based on the results, prevalence rates of stunting, wasting and underweight, anaemia, vitamin A deficiency, malaria and low cognitive performance were determined.

Results: When combined with deworming, a significant decrease of anaemia could be achieved. Cognitive performance also improved significantly.

Further Reading

- FAO State of Food Insecurity in the World (SOFI) reports, especially the 2013 report.
- FAO: Ballard, Terri; Kepple, Anne; Cafiero, Carlo (2013): The Food Insecurity Experience Scale. Development of a Standard for Monitoring Hunger Worldwide
- FAO: Brunelli, Chiara; Viviani, Sara (2014): Exploring gender-based disparities with the FAO Food Insecurity Experience Scale
- FAO, USAid, FANTA III (2016): Minimum Dietary Diversity for Women. A Guide to Measurement
- IFPRI, DWHH, Concern Worldwide (2017) Global Hunger Index. The inequalities of hunger.
- Maxwell, Dan et al. (2003): The Coping Strategies Index: A tool for rapidly measuring food security and the impact of food aid programmes in emergencies. In: FAO International Workshop on "Food Security in Complex Emergencies: building policy frameworks to address longer-term programming challenges"
- WHO (2008): Indicators for assessing infant and young child feeding practices. Part 1 Definitions: http://apps.who.int/iris/bitstream/10665/43895/1/9789241596664_eng.pdf
- WHO (2010): Indicators for assessing infant and young child feeding practices. Part 2 Measurement: http://www.who.int/maternal_child_adolescent/documents/9789241599290/en/index.html