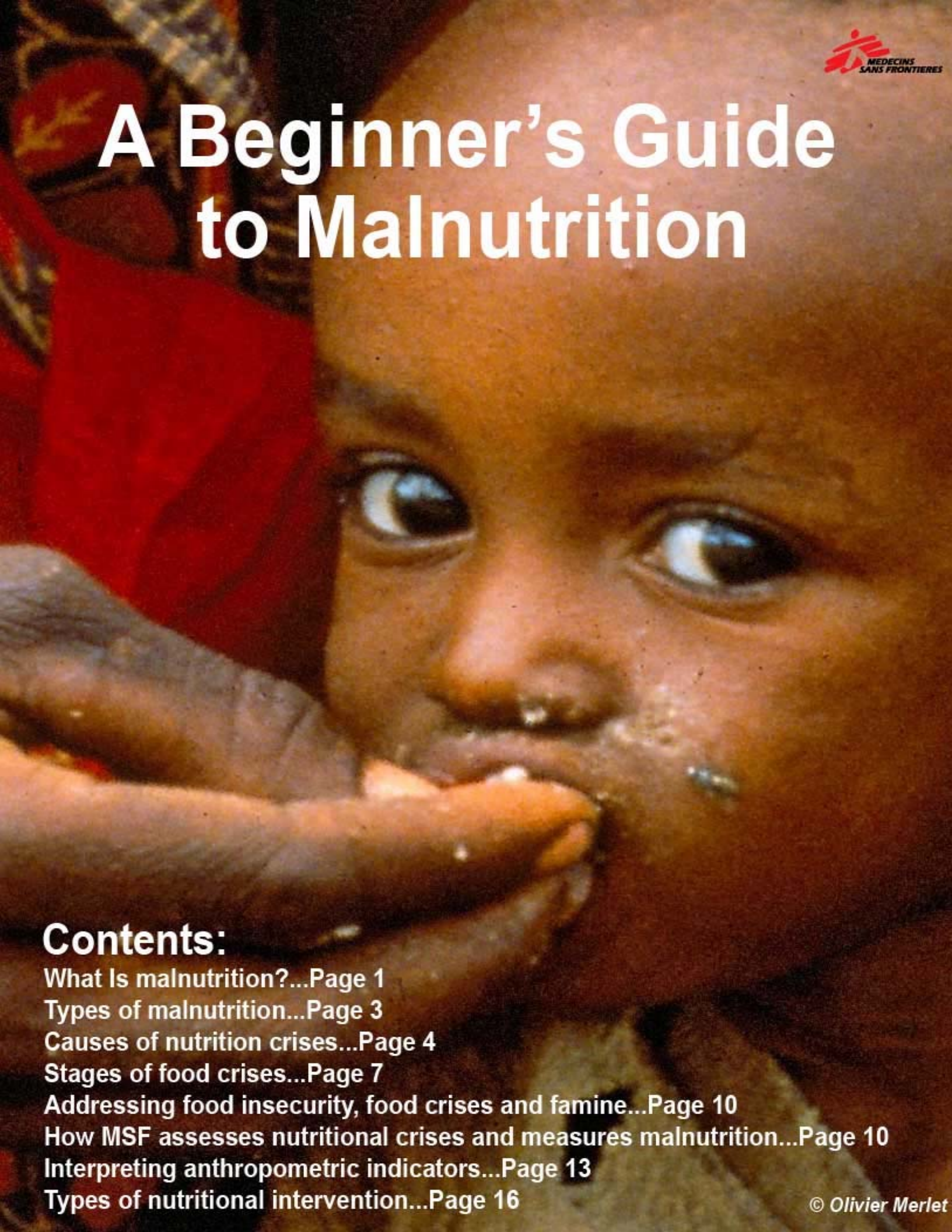

A Beginner's Guide to Malnutrition

Contents:

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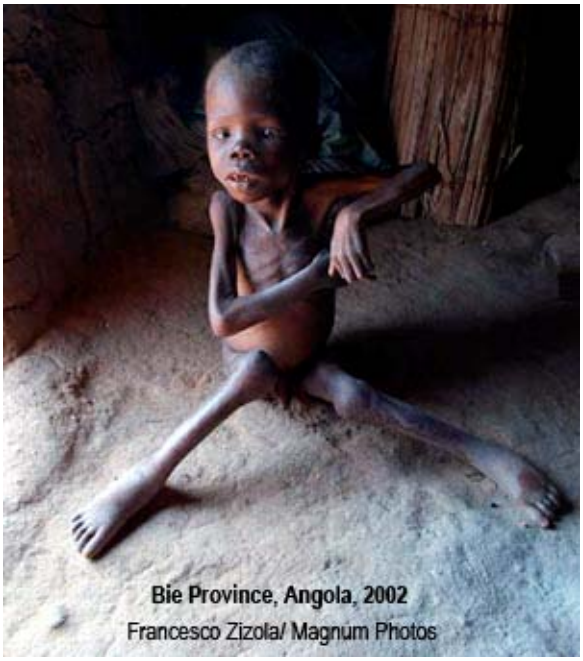

Bie Province, Angola, 2002
Francesco Zizola/ Magnum Photos

Acute malnutrition affects 60 million children under five and contributes to 5 million deaths each year worldwide.

Understanding nutritional crises and famines is no easy task. Nutritional crises usually result from a number of factors interacting in complex ways. Hunger and famine are extremely emotive and politically sensitive subjects. Even the definition of what a famine is varies between different international organizations.

This guide aims to explore different aspects of nutritional crises and to explain MSF's role in trying to deal with malnutrition. The first section looks at how malnutrition physically affects the individual. The second looks at different stages of nutritional crises and what causes them. The final part explains the role NGOs, governments and international organizations play in trying to address malnutrition, and looks specifically at what MSF does in the field.

What Is Malnutrition?


Roger Job
Ajiep, Sudan, 1998

On average, the human body needs more than 2,100 kilocalories per day to lead a normal, healthy life. Adequate nutrition is essential for the physical development and maintenance of the body as well as resistance to disease, ability to learn and energy to work.

Malnutrition is defined as an imbalance between the body's supply of nutrients and the body's demand for growth, maintenance and specific activities. When a person cannot take in sufficient nutrients to meet their needs, the body begins to waste away. First they lose fat, and then muscle.

Malnutrition is not measured by how much food is eaten, but by physical measurements such as weight and height. Malnutrition in children is often measured by comparing their weight measurement with what would be expected for someone their height. Once a child has fallen below 80% of the weight that is average for their height they are defined as “acutely malnourished”. Swellings on both feet, known as ‘bilateral oedema’, are also a sure symptom of malnourishment in children.

If children are under-nourished over a long period of time, their growth may be stunted. This is known as *chronic malnutrition*. If they experience rapid weight loss – or ‘wasting’ – over a short period of time, they are described as suffering from *acute malnutrition*.

Even if people have sufficient quantities of food to eat, they can become malnourished if their food does not provide the right amount macro-nutrients (proteins, fats and sugars) and micro-nutrients (vitamins and minerals). In other words, malnourishment is to do with the quality as well as the quantity of food.

Malnutrition and disease can interact in a vicious cycle. Inadequate food intake results in the body being increasingly sensitive to infections. Infections often lead to poor appetite and nausea - resulting in reduced food intake - and can also impair the body’s ability to absorb nutrients. In turn, malnutrition weakens the immune system and increases the incidence, severity and duration of infections. This dangerous cycle can ultimately lead to death.

Young children are more vulnerable to malnutrition than adults, for several reasons. Children are growing, so their relative needs for nutrients are greater. Because they are not able to ingest large bulky meals, they need small frequent feeds, which mothers may not be able to provide during emergency situations. Children are especially susceptible to malnutrition when they are weaned from their mother’s breast milk to a diet deficient in protein and other nutrients. Pregnant and breastfeeding women are also particularly vulnerable to malnutrition since extra energy is needed during pregnancy and lactation.

Types of malnutrition

Macro-nutrient deficiency

The most common form of malnutrition, called **marasmus**, occurs when an individual is unable to take in a sufficient quantity of food in general. Children with marasmus are severely wasted, with no fat and very little muscle tissue left on their body. They often appear old and shrivelled and have prominent ribs and limb joints. They are left with almost no subcutaneous fat and their internal organs, including the heart and the blood, are weakened. With no reserves to fight infection, illnesses such as pneumonia, diarrhea, and measles can be fatal.

The second common type of malnutrition in children is **kwashiorkor**, which is specifically caused by a lack of protein-energy and certain micro-nutrients in the diet. Symptoms of kwashiorkor include a swollen abdomen, severe anemia and 'oedema' – swellings of the feet, legs and arms which can make up 30% of a child's body weight. Another distinctive symptom is hair turning red and falling out. Like marasmus, kwashiorkor kills by lowering resistance to infection. However, it can also be fatal in its own right, because it disturbs levels of salts and minerals in the body.

Micro-nutrient deficiency

Other forms of malnutrition result from vitamin and mineral deficiencies. Micronutrients are necessary in small quantities to ensure proper metabolic functioning.

Vitamin A deficiency weakens the immune systems of a large proportion of under-fives in poor countries, increasing their vulnerability to diseases such as diarrhea, measles and malaria. Lack of vitamin A can also lead to eye diseases and eventually blindness.

Iodine is necessary for the thyroid to function normally and for development of the nervous system during the first trimester of pregnancy. Iodine deficiency results in goitre and 'cretinism', associated with severe mental retardation and physical stunting.

Vitamin B1 deficiency can lead to beriberi. There are several different types of the disease, which can affect the nervous system and heart and cause gastrointestinal problems. It often occurs when white rice is the staple food in a population's diet.

Lack of **vitamin C** can lead to scurvy. It mainly occurs when people have little access to fresh fruit and vegetables.

Vitamin B3 deficiency leads to pellagra, which is indicated by diarrhea, dementia and skin lesions (often around the neck).

Causes of Nutrition Crises

Poverty

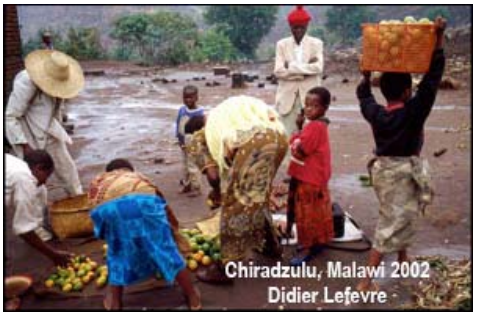
We are used to seeing images of malnutrition in the context of high-profile crises such as droughts and wars. In fact, the vast majority of the estimated 800 million hungry people in the world are not the victims of sudden, abnormal incidents, but rather endure long term, chronic malnutrition as a result of poverty.

The poverty-stricken do not have enough money to buy or produce enough food for themselves and their families. Poor farmers cannot afford to buy land, seeds, equipment or water. Craftsmen lack the means to pay for the tools to ply their trade. Poor regions of the world lack key agricultural infrastructure such as irrigation equipment, storage facilities and roads and vehicles to transport food.

The Hunger Gap

In many places, malnourishment occurs in regular cycles, according to the seasons and the harvesting time of year. Populations experience seasonal food shortages or “hunger gaps”. For farmers, this usually occurs before a harvest season when food stocks from previous harvests have been exhausted and market prices are high. For pastoral populations, it often occurs at the end of a dry season, when grazing areas are scarce and epidemics in livestock are prevalent.

Food Distribution Mechanisms



Famine and food crises do not necessarily occur because of an absolute lack of food in a particular region. Inequalities built into mechanisms for distributing food and the economic incentives that drive food markets can create severe food shortages. If it is more profitable for farmers to sell their produce to other regions or abroad rather than to the local market, the poor in the region may have no access to food, even if lots is being produced locally. Local producers may also stockpile food until the hunger gap period in order to sell it at inflated prices when people are most desperate.

Food crises can also be the deliberate or unintentional result of government policy. Repressive governments can manipulate food availability in certain regions in order to suppress their opponents and the populations that support them. In other cases, food crises are the consequence of a lack of governance, when civil disorder causes food distribution mechanisms to break down completely. As the Nobel prize winning economist Amartya Sen famously noted in the 1980s, no functioning democracy has ever suffered from a famine.

War


Monrovia, Liberia, 2003
Jehad Nga/Corbis

There are many ways in which war can lead to a nutritional crisis. Combatants frequently loot or destroy the food supplies of their enemies and systematically wreck local markets. Fields and water wells are mined and contaminated, land is requisitioned for military purposes, and stocks are stolen to feed militias or armies. People are forced to abandon their land because of the threat of violence and find it impossible to return to sow and harvest because of insecurity.

Natural disasters


Dinsor, Somalia, 2006
Stefan Pleger

Drought due to failure of the rains is a common cause of large scale food crises. Drought can lead to failure of crops and death of livestock. Problems are often exacerbated by poor agricultural practices such as over-farming and over-grazing of land. Environmental problems such as soil erosion, desertification and deforestation also threaten fertile farmland. Tropical storms, earthquakes and floods can destroy crops and food stocks and damage the infrastructure and equipment needed to produce and transport food.

Cultural Practices

Cultural practices can play a significant role in determining the nutritional status of sectors of a population. In some societies, men are traditionally given priority in food allocation. This can lead to a greater risk of women becoming malnourished, particularly those of reproductive age who lose iron during their monthly periods and require more energy, protein and micronutrients during pregnancy and breastfeeding.


Markounda, Central African Republic, 2006
Ton Koene

Breastfeeding and weaning practices can also have a crucial influence in child nutrition. For example, traditional weaning foods in West Africa such as maize and cereal ‘pap’ are of low nutritional value in terms of protein and energy. In some areas, the early introduction of solid foods

and unhygienic feeding practices result in malnutrition, growth retardation and infection. Some communities also believe that depriving children of food can cure them of diseases such as measles.

Environmental Factors

Environmental factors can considerably aggravate nutritional crises. Poor water quality, a lack of sanitation and inadequate public health services can all contribute significantly to the deterioration of a community's nutritional status, by increasing the prevalence of health problems such as diarrhea and dysentery.

Stages of food crises

'Food security' means the ability of the household to secure, either from its own production or through purchases, adequate food for meeting the dietary needs of all members of the household. Food security is determined by whether food is available, accessible and affordable. It is also determined by whether that food can actually be utilized, which depends on the availability of firewood, utensils, tools, water and so on.

Food insecurity is a situation in which a population does not have sustainable access to sufficient food to meet dietary needs. Food insecurity is usually temporary: households are generally able to resume viable livelihoods once the food situation has improved.

When food access and/or availability deteriorates, food insecurity can worsen to famine. The process generally occurs in three stages:

Food insecurity
↓
Food crisis
↓
Famine

Food crises are caused by unexpected severe food shortages. In non-conflict situations, food crises can be prompted by a gradual deterioration of food access caused by prolonged or repeated droughts, flooding, large livestock epidemics,

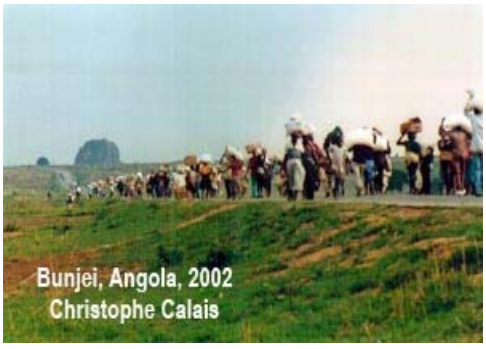
economic crisis, etc. In conflict situations, communities may experience sudden reductions in food availability due to forced population movement, destruction or looting of crops and livestock, unsafe access to markets etc.

In such circumstances people turn to ‘coping mechanisms’, for example reducing the number of meals they eat per day and eating food which wouldn’t normally be part of their diet, such as leaves. They may be forced to sell goods essential to their future livelihood (e.g. cattle). Once this stage is reached, a return to normal livelihood is difficult since their future productive capacity has been compromised.

If the situation worsens, community structures collapse, skilled and educated people –including health staff - migrate, and there is a reduction of support to non-productive members of households such as the elderly and disabled. Such periods are also characterised by the increased marginalisation of non-productive people (orphans, beggars etc.)

Famine is an absolute lack of food affecting a large population for a long time period. There are very few situations today in which a famine can be considered a purely "natural" disaster. Drought, flood and other environmental factors can of course lead to food shortage, but there are almost always human forces at work as well - such as war, an unstable political and economical environment and the forced displacement of populations.

During a famine, households are destitute and no longer have coping mechanisms to fall back on. People often leave their homes in search of food - an event known as ‘distress migration’. In a famine, insufficient food and poor health care are the leading causes of death for severely and moderately malnourished people. A common indicator of a famine is that the mortality rate is high for adults as well as children.



The word "famine" has highly emotive and political connotations and over the past decades there has been extensive debate among international relief agencies regarding the precise definition. That debate continues today.

The table below outlines MSF's understanding of how food insecurity, food crises and famine can be differentiated:

Specific characteristics in times of food insecurity, food crisis and famine

	Food insecurity	**Food crisis**	**Famine**
Livelihood changes	Temporary	Threat to the future	Complete destitution
Food availability	Normal or slightly reduced	Reduced	Rare or none
Food accessibility	Slightly reduced	Reduced	Severely reduced or none
Dependence on food aid	Low	Moderate to high	Full
Social breakdown	Less time available for social support. Care restricted to direct family members	Decreased support for socially vulnerable such as the elderly, orphans and disabled people	Social collapse: broken families, traumatised people
Population movement	Seasonal migration, mainly men	Migration of families, population displacement	Distress migration
Affected by Malnutrition	Physically vulnerable (related to disease)	Socially vulnerable, (related to poverty, access and care)	Everybody, all age groups (related to general lack of food)
Global malnutrition rate	Low or moderate (0-10%)	Moderate (10-15%) to High (20-40%)	High (> 40-50%)
Severe malnutrition rate	Low (<3%)	Moderate (3-5%)	High (>5%)
Severe malnutrition in adults	Low	Some	High
Crude Mortality Rate (CMR)*	Comparable with an average year. Less than one person per 10,000 in the population dies per day.	Moderate to High Between one and two people die per 10,000 in the population per day.	Catastrophic More than five people die per 10,000 in the population per day. The mortality rate is then more than ten times the 'normal' rate.

**The CMR expresses the number of people of any age who die on an average day, out of a population of 10,000. The 'normal' CMR is considered to be 0.5*

Addressing food insecurity, food crises and famine

There is no universal, standard approach to nutritional problems. Response strategies vary according to the context of a food crisis, its development, and practical constraints. There are usually many different organisations involved in addressing food crises, from local community based groups, to national governments, international NGOs and the United Nations.

MSF's role is generally to give emergency medical care to the most vulnerable and provide nutritional support to those most in need, such as children, pregnant and lactating women and people with chronic or acute illnesses. MSF also advocates for increased food assistance for a population when the organization is concerned about a worsening crisis. It makes no sense to provide medical treatment for malnutrition if no food is available to patients once they are fit to leave the programme.

Although MSF does sometimes organize targeted distribution of food (known as 'blanket distributions') it is rare for the organization to be involved in massive scale 'general food distributions', since that is generally the responsibility of one of the United Nations agencies, usually the World Food Programme (WFP). However, if MSF saw an urgent need for a General Food Distribution and other organizations failed to implement it, MSF would step in. MSF does *not* run long term food security programmes, unlike development NGOs such as Oxfam.

Before deciding whether to start a nutritional programme in a particular region, MSF tries to gather as much information as possible about the situation there. This is done both through rapid assessment visits and through sharing information with the government, local authorities and other NGOs.

How MSF Assesses Nutritional Crises and Measures Malnutrition

It is critical to carefully assess malnutrition levels in a population before and during a nutritional intervention. This is to determine the severity and magnitude of a situation. Nutritional surveys help MSF to measure and monitor the prevalence of acute malnutrition in a population; identify vulnerable groups; plan and design the appropriate nutritional programmes and establish a baseline from which to follow the evolution of the nutritional status of a population over time.

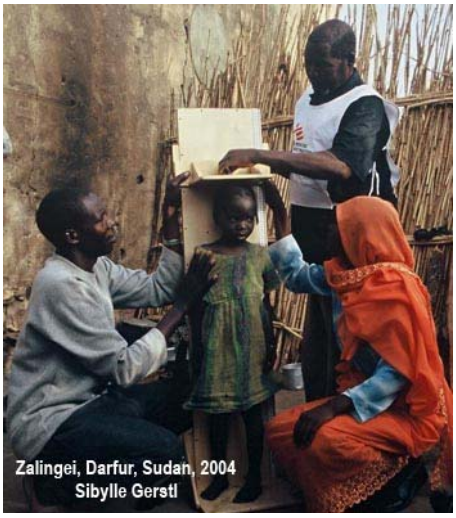
Nutritional surveys compare 'anthropometric' measures such as weight, height, age and mid-upper arm circumference. They are carried out among children aged from 6 months to 5 years, largely because children under five are particularly sensitive to changes in food availability and changes in their nutritional status are considered to reflect food stresses in an entire population.


Shangil Tobaya, Darfur, Sudan, 2004
Juan Carlos Tomasi

Standardized reference tables are available for this age group. This allows the results of a study to be interpreted according to a universally agreed reference population, which is extremely important because meaningful comparisons can then be made. Internationally recognized reference values for teenage and adult populations currently do not exist – a subject of ongoing debate amongst nutrition specialists.

Carrying out a nutritional survey

A good nutritional survey requires sophisticated statistic analysis. If the population under study is very small (up to about 5000 people), it may be possible to carry out an 'exhaustive survey', in which every single person in the group is visited and assessed.


Zalingei, Darfur, Sudan, 2004
Sibylle Gerstl

However, because nutritional crises usually affect larger populations, surveys are generally carried out on a sample of the population. As with all sampling, its crucial to make sure that the sample chosen is as representative as possible. A population under stress have an interest in trying to direct NGO staff towards the most needy cases in their community in order to try and secure their help and food assistance. However, in order to get a really accurate picture of the nutritional status of the whole community, it is important to be as rigorous as possible about surveying a sample selected as randomly as possible.

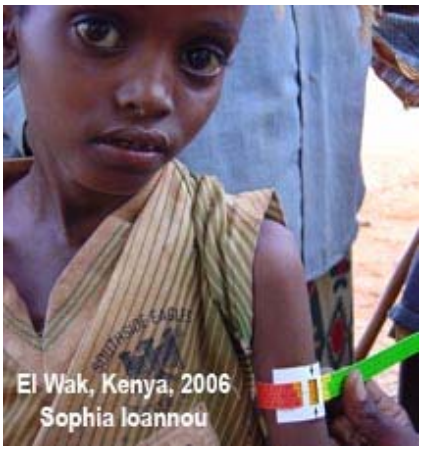
The two principle methods used by MSF for doing so are "Systematic Sampling" and "Cluster Sampling".

Systematic sampling is a method based on the geographical organisation of an area. Because every household should have the same chance of being surveyed, it can only be used if households are arranged in an ordered way, for

instance in a grid layout. Since this is quite a rare occurrence, the technique is mainly used in well-organized refugee camps where shelters are arranged in blocks and rows.

Cluster sampling is used when no detailed register of the population is available, and the geographical organisation is not compatible with systematic sampling. With this method, the smallest sector for which the population size can be estimated is chosen as the sampling base (city block, village etc).

In the first stage of sampling, 30 'clusters' of this sector are randomly selected. In the second stage, the survey team go to the centre of the section within which the cluster is located and spin a pen on the ground in order to randomly choose which direction to go in. They then walk in that direction, numbering the houses they encounter along the way. Next they draw a random number to select which of the houses to visit first. They survey any children under 110 cm tall in that household, and then proceed from house to house by proximity (for example the next house immediately on the right or on the left; this must be determined in advance). They continue sampling until they have covered 30 children in 30 clusters – a total of 900 children. Statistical analysis shows that this large sample size is necessary to provide sufficient precision.



At each household visited they take anthropometric measurements of all children aged 6 months to five years – usually their weight, height, sex, age and record the presence or absence of bilateral oedema. In many places, parents don't know the real age of their children, so the age group has to be approximated by choosing children between 65 and 110 cm tall. They also take 'MUAC' – mid-upper arm circumference – measurements (see box). The team may also gather extra information such as whether the child has been immunized against measles and whether the family has access to cooking equipment and fuel.

The team often simultaneously carry out what is known as a 'retrospective mortality study' in order to get an idea of the number of deaths that have occurred over a past given period. They choose a date which is memorable to the community – often a religious or local festival – and ask if any family members have died since that date.

Interpreting Anthropometric Indicators

Different systems of classification are used when defining malnutrition in individuals or in populations:

For individuals: malnutrition is categorised into *moderate acute* or *severe acute*.

For populations: malnutrition is categorised into *severe acute* and *global acute*. Global acute malnutrition refers to the total cases of moderate acute and severe acute malnutrition in a population. The severe acute malnutrition rate is often referred to as 'SAM' and the global acute malnutrition rate is known as 'GAM'.

Individuals

Putting the various anthropometric measurements against each other and comparing them with a reference population helps the MSF team to judge whether individuals are malnourished. The indices are compared with a cut off point below which an individual is considered to be malnourished.

In emergency situations, comparing children's **weight for their height** against a reference index is the most common way of quantifying acute malnutrition. Weight for height measurements are the best indicator of *wasting* and reflect recent weight loss or gain. They therefore are a good indicator of an abnormal or emergency situation. Weight for height measurements are usually recorded in terms of statistical expressions known as 'Z-scores' and 'percentage of the median' results (*see box*).

Comparing children's **height for their age** is the best indicator of *stunting,* which reflects a long term, chronic problem. When nutrition is inadequate over a long period of time, children grow slowly. Low height for age indicates a slowing in skeletal growth.

And now for the maths bit… classifying malnutrition using "Percentage of the Median" and "Z-score" results.

Nutritionists use two types of statistical expressions to classify degrees of malnutrition. Both involve comparing the weight of a child against standardized reference tables. These tables indicate the weight that should be expected for children of different heights, according to a normal distribution curve. The child's nutritional status is then classified according to certain cut-off points shown in the table below.

The "**percentage of the median**" result expresses the weight of a child as a percentage of the median expected weight for that height group.

For example:

A child is 70 cm tall and weighs 6.3kg. The reference table shows that the median weight for a child 70cm tall is 8.5kg.

$$\frac{6.3}{8.5} \times 100 = 74.1\%$$

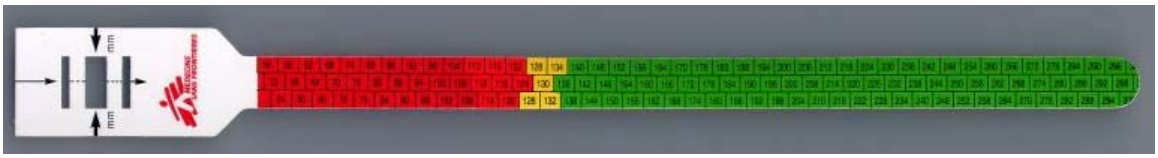
74.1% is between 70 and 80%, so the child has moderate acute malnutrition.

The **Z-score** represents the difference between the observed weight and the median weight of the reference population expressed in standard deviation units.

Weight for Height cut-off points

	Percentage of the median	**Z-scores**
Severe acute malnutrition	Less than 70%	Z-score less than -3
Moderate acute malnutrition	Between 70% and 80%	Z-score between -2 and -3

MUAC measurements are a fast, approximate measure of acute malnutrition in children under the age of five. MUAC stands for "middle upper arm circumference". The MUAC measure is a long plastic strip with a series of color bands:



The MUAC bracelet is put around the child's bare upper arm to measure its circumference. The colour band then indicates the level of malnutrition:

Green: >135mm (normal)

Yellow: 125-134mm (risk of malnutrition)

Orange: 110-124mm (moderate malnutrition)

Red: <110mm (severe malnutrition and risk of death)

MUAC measurements are used for rapid assessment during emergencies and are a good predictor of risk of death. They provide a 'rough and ready' estimation of malnutrition and always need to be followed up with further detailed analysis of the situation.

Bilateral oedema - swelling in the feet, legs or face - is a separate, clinical indicator of severe malnutrition in children (oedema in adults can be provoked by other pathologies such as renal and cardiac problems).

Populations

The next step is to determine which proportion of the population is malnourished, in order to assess the severity of the situation. The most commonly used measure is known as the **global acute malnutrition rate**. This is found by calculating the percentage of children under five in a population who are either moderately or severely malnourished.

As a general guideline, a global malnutrition rate of 5 – 10% is considered to indicate a precarious situation. A rate of 11 – 20% indicates a severe situation**. If the global acute malnutrition rate is over 20% the situation is very severe.**

However, it is important to understand that a “standard recipe” for interpreting nutrition survey results does not exist. The results must be analysed in combination with other information about the context of the crisis and preferably mortality figures for recent months. For example, it is important to find out the local market prices of food and livestock and to know whether a General Food Distribution has been organised. The significance of the figures also depends on whether the survey was done before or after the harvest. MSF teams always draw a ‘seasonal calendar’ in order to understand the agricultural cycle in a specific region and mark out when the hunger gap and harvest periods are.

Figures obtained through a single survey also only provide a snapshot of the nutritional status of the under-five population at the moment of the survey in a certain region. Taken alone, these figures do not give any indication about whether the nutritional status is improving or deteriorating.

Types of Nutritional Intervention

Once MSF has a picture of the severity and nature of the crisis, the teams decide on the most appropriate type of programme. Broadly speaking, emergency nutritional programmes are classified into:

General Food Distribution → targets entire population
Blanket Food Distribution → targets entire families
Supplementary Feeding Programme → targets selected individuals
Therapeutic Feeding Programme → targets individuals

MSF is also involved with non-emergency nutritional support programmes.

General Food Distributions (GFD)

A General Food Distribution is considered to be the key intervention for ensuring the health and survival of population experiencing food crisis and famine. General Food Distributions target the whole population, or whole regions or groups. The objective is to cover the immediate basic food needs of an entire population group and prevent death and the deterioration of their nutritional status.

During General Food Distributions, regular rations are given out regularly to households through local government, traditional leaders, community leaders etc.

MSF is rarely involved in the distribution process itself (which is usually the responsibility of the World Food Programme and its partners). However, MSF may be involved in monitoring food and in advocating for an increase in the frequency or rations of a General Food Distribution when the teams think it is necessary.

Blanket Food Distributions (BFD)

Blanket Food Distributions are usually short term interventions which aim to increase food availability and accessibility rapidly for a limited period. They are often used as 'damage control' mechanisms to prevent the deterioration of a population's nutritional status when a General Food Distribution has been inadequate, inequitable or ineffective.

MSF uses Blanket Food Distributions if the teams on the ground believe it is necessary to support the nutrition of **families of vulnerable people.** The team first calculates the average family size in the population and decides on a suitable standard family ration. They then select one type of family member – often children under five, but sometimes elderly individuals – and distribute rations to the family of all those people in the community. If the selection is based on children under 5, and there are two such children in a family, the family would receive two rations.

Blanket Food Distributions are 'rough and ready' emergency interventions which can cover large populations and are easier to implement than General Food Distributions. However, they are imperfect mechanisms in the sense that rations are not adapted according to the size of each family, they don't allow vulnerable individuals to be carefully monitored, and families without children under five often miss out. For these reasons, as soon as an adequate General Food Distribution system is implemented, the Blanket Food Distribution stops.

Supplementary Feeding Programmes

Supplementary feeding programmes provide individual nutritional and medical treatment for moderately malnourished children (younger then five years) and sometimes pregnant and lactating women. The aim is to treat moderate malnutrition and prevent severe malnutrition.


Katanga, Democratic Republic of Congo
Veronica Nicola, 2005

Supplementary feeding programmes can involve distributing “dry rations” or “wet rations”. Dry rations are uncooked or partially cooked food items distributed once a week or fortnight. Wet rations are cooked meals delivered once or twice daily on–site.

Therapeutic Feeding Programmes


Dungas, Niger, 2005
ean-Pierre Amigo

An MSF Therapeutic Feeding Programme provides intensive medical and nutritional treatment for **severely malnourished individuals**. Proper medical treatment and follow-up are crucial to avoid the death of patients.

The treatment is divided into two phases. The first phase is designed to medically stabilise patients. Phase One patients are treated in an inpatient treatment unit, or **ITFC,** where intensive medical and nutritional care is provided 24 hours a day. The second phase focuses on nutritional rehabilitation. Depending on the degree of malnutrition and whether they have medical complications, children either enter as Phase One patients and then progress to Phase Two, or enter directly as Phase Two patients.

Phase One treatment involves 24-hour intensive care. Medical complications are treated and therapeutic feeding is started. This comprises eight feeds per day, often of a therapeutic milk called F75. Treatment is not intended to make the patient gain weight. In fact, a weight loss is expected in patients with oedema (swelling), as they should lose their oedema. All patients must be carefully monitored for signs of overfeeding during this initial phase in order to avoid heart failure.

Patients are eligible to enter **Phase Two** treatment if they have no medical complications, show appetite and have no oedema. They receive four to six meals per day of high energy content food and are monitored closely. Constant weight gain is an important sign of recovery and should be about 10 g/kg/day.

When patients have recovered to reach the appropriate weight for their height, they are discharged from the therapeutic feeding programme. They are often then referred to a Supplementary Feeding Programme.

The set up of a therapeutic feeding programme depends on the specific circumstances of the population. Conventionally, the two phases of treatment are combined and patients are treated during both Phase One and Two in a 'therapeutic feeding centre', or **TFC**.

However, in recent years there has been a move towards providing decentralized, community-based therapeutic care in some circumstances. With a conventional TFC, the child's carer – normally the mother – is required to leave the family for the full length of the treatment, usually between 30 and 45 days. This can be problematic, especially if she has other malnourished children at home and needs to acquire and prepare food for them. Centralised TFCs are also poorly adapted to large-scale nutritional crises since they are resource-intensive and require a lot of skilled staff .


Biu, Nigeria, 2005
Ton Koene

In community-based therapeutic feeding programmes, Phase Two treatment is carried out on an outreach or 'ambulatory' basis. Patients are treated in their homes using ready-to-use therapeutic foods (see box) and monitored by medical staff once a week.

This type of programme may be more appropriate when the population is more widely spread out and when it is difficult for mothers of severely malnourished children to spend long periods of time away from home. TFCs are still likely to be used when the population at risk is gathered together in one place, for example in camps for refuges or displaced people.

Ready-To-Use Therapeutic Food ("RUTF')


El Wak, Kenya, 2006
Sophia Ioannou

Ready-to-use therapeutic foods were first developed in the late 1990's and have marked a minor revolution in nutrition programmes in recent years. They are specially designed to provide high protein and energy content and essential micronutrients, whilst being easy to use and distribute. MSF commonly uses ready-to-use therapeutic foods called BP-100 and 'Plumpy'nut' which is a paste based on peanuts. Plumpy'nut comes in individual sachets, each of which contains 500 kilocalories as well as a complex of vitamins and minerals.

Plumpy'nut is especially useful in difficult environments because it doesn't need to be mixed with water (clean or boiled water can be hard to come by). It comes in individually wrapped airtight foil sachets which are hygienic and easy to distribute, and it is resistant to bacterial infection. It has a long shelf life, so can be stored, transported and used in high temperatures.

Ready-to-use therapeutic foods have to date chiefly been used to treat severe acute malnutrition in children. However, some nutrition experts believe that there is significant potential to develop this type of product further and use it more widely, for example for moderately malnourished children, pregnant and lactating mothers, HIV+ individuals in need of nutritional support and for children of weaning age.

Supportive nutritional programmes

As well as running emergency nutritional programmes in areas where access to food is limited, MSF sometimes also runs programmes to improve the nutritional status of people suffering from specific diseases. The amount of nutritional support offered varies between different contexts, but these programmes usually target patients suffering from tuberculosis, HIV/AIDS, trypanosomiasis, shigellosis and measles.

Further Reading

Famine that kills: Darfur, Sudan *Alex de Waal*, 2005
Where and why are 10 million children dying every year? *Black, Morris and Bryce*, Lancet Vol 361, 2003
Changing the way we address severe malnutrition during famine, *S. Collins*, Lancet vol 358, 2001
Supplemental feeding with ready-to-use therapeutic food in Malawian children at risk of malnutrition, *Patel, Sandige, Ndekha, Briend, Ashorn and Manary*, J. Health Popul Nutr, 2005