MODULE 5

Causes of malnutrition

PART 2: TECHNICAL NOTES

This is part two of four parts contained in this module. These technical notes provide information relating to the causes of malnutrition. These notes are intended for people involved in nutrition programme planning and implementation. The notes cover the major technical details, highlighting challenging areas and provide clear guidance on accepted current practices.

Summary

This module explores the causes of *malnutrition*. A conceptual model for analysing the causes of malnutrition is explained. This model can be used to help understand the complex elements that impact at the different levels and how they influence the nutritional situation of individuals. The model encourages people to look beyond the food needs of a population in order to improve the nutrition situation. The module discusses the application and limitations of the conceptual model and the use of cross-sectional data to identify needs and prioritise programmes. There is an overview of the *infection-malnutrition cycle* and the interaction between malnutrition and the major diseases.

Key messages

1. Malnutrition has many interrelated immediate and underlying causes that need to be addressed effectively during an emergency.
2. The conceptual model of malnutrition is a useful tool to help understand the many factors that impact on nutrition status. It identifies three levels of causality: immediate, underlying and basic which can all be exacerbated during emergencies.
3. The conceptual model can be used for the following;
   - To create a checklist to identify and prioritise the short and long term needs of vulnerable groups and the general population during an emergency.
   - It can encourage organisations to form consensus on the priority needs.
   - It provides a structure to organise and analyse data collected during surveys.
4. The limitations of the conceptual model are;
   - The conceptual model is not an assessment tool.
   - It does not take into account individual factors that affect nutritional status.
   - It does not take into account how the different elements that impact on nutrition may be affected by seasonal factors.
5. Cross sectional data concerning factors impacting on the nutrition situation may indicate an association but this does not necessarily mean causation.
6. The immediate causes of malnutrition are inadequate diet and disease, both of which can make each other worse; this is referred to as the infection-malnutrition cycle.
7. There are three main underlying causes: inadequate household *food security*, inadequate care and inadequate health services and an unhealthy household environment.
8. The basic causes of malnutrition are related to potential resources and the social, political, ideological and economic context.

Note: Nutrition responses during emergencies largely focus on reducing the *prevalence of undernutrition*. Therefore the focus of this module is to explore the causes of undernutrition. For the different types of malnutrition refer to Module 3.

Sphere standards

These technical notes are based on the technical references given in the resource list for the module and the Sphere standards shown in the box below:

Food Security and Nutrition Assessment Standard 2: Nutrition[1]

Where people are at increased risk of undernutrition, assessments are conducted using internationally accepted methods to understand the type, degree and extent of undernutrition and identify those most affected, those most at risk, and the appropriate response.

Key Actions

- Compile existing information from pre-disaster and initial assessments to highlight the nature and severity of the nutrition situation.
- Identify groups with the greatest nutritional support needs and the underlying factors that potentially affect *nutritional status*.
- Determine if population level qualitative or quantitative assessments are needed to better measure and understand anthropometric status, micronutrient status, infant and young child feeding, maternal care practices, and associated potential determinants of undernutrition.
- Consider the opinions of the community and other local stakeholders on the potential determinants of undernutrition.
- Include an assessment of national and local capacity to lead and/or support response.
- Use nutrition assessment information to determine if the situation is stable or declining.

Key Indicators

- Assessment and analysis methodologies including standardised indicators adhering to widely accepted principles are adopted for both anthropometric and non-anthropometric assessments.
- Assessment findings are presented in an analytical report including clear recommendations of actions targeting the most vulnerable individuals and groups.

Introduction of the Conceptual Model

Figure 1 illustrates the conceptual model developed to help understand the causes of malnutrition. All causes of malnutrition act on the individual, but some causes act directly on the individual and other causes act indirectly through a longer causal pathway which is captured in this model. The conceptual model identifies three levels of causality:

1. Immediate causes that act on the individual.
2. Underlying causes that act on households and communities.
3. Basic causes that act on entire societies but have a greater or lesser impact on specific groups within society.

Over the years organisations have adapted the original UNICEF conceptual framework and frequently expanded it in a particular area of interest to assist with assessments which focus on their particular area of service delivery, for example World Food Programme (WFP) and Food and Agricultural Organisation (FAO) focus on food security and have expanded the conceptual model to reflect this interest. So while there are many adapted versions that reflect a particular focus, the original UNICEF conceptual framework remains a useful tool to help understand the causes of malnutrition.

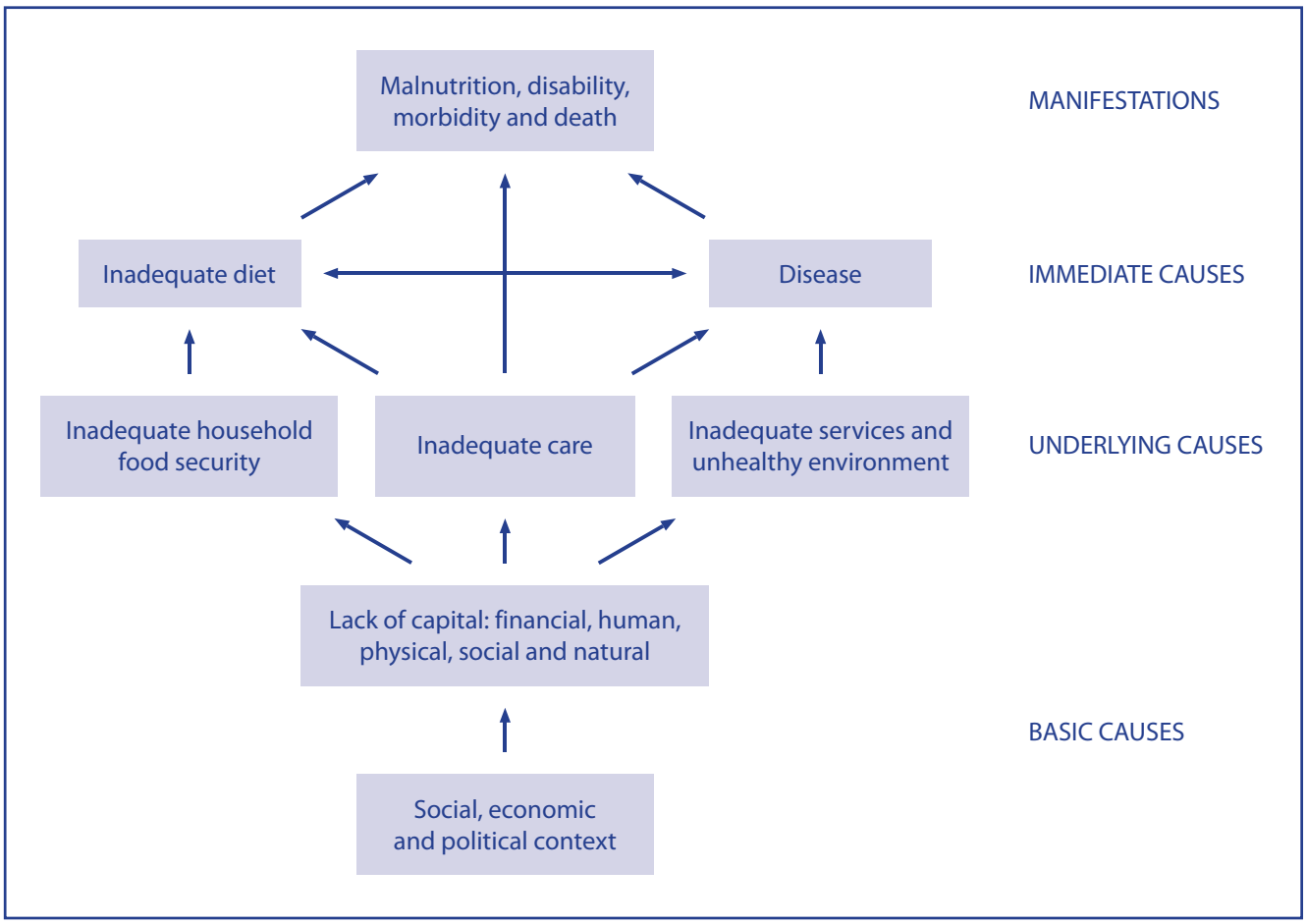
Seasonality and its impact on nutrition

Causal pathways which act directly or indirectly on nutritional status may be affected by the seasons of the year.

For example, there are seasonal cycles in food availability and access as a result of agricultural cycles which contribute to variations in household income and expenditure. Food stocks have often been consumed and prices in the market tend to be high just before a harvest: this is referred to as the 'hungry' period. This may have an impact on the quality and adequacy of the diet. When farmers are busy it can affect the degree of care they give to their children. During the rainy season drinking water may be collected from nearby contaminated water

[1] Source: The Sphere Project (2011). *Humanitarian Charter and Minimum Standards in Humanitarian Response, Chapter 3: Minimum Standards in Food Security and Nutrition*. Geneva: The Sphere Project.

Figure 1: A simplified conceptual model for understanding the causes of malnutrition.[2]



pools rather than walking further distances to safe water sources. Because of this, diarrhoea is often common during rainy seasons, while diseases such as malaria, dengue fever and yellow fever may be common after the rains, the period when mosquitoes breed. In emergencies, the impact of these seasonal changes may become more pronounced and have a greater effect on the poorest people and the prevalence of malnutrition may increase.

Some basic causes such as flooding and conflict may increase during particular seasons.

Some shocks may not be dependent on the seasons, such as a tsunami, and may impact on the nutrition situation at the three different levels of causality.

It is possible to draw a seasonal calendar to illustrate the variation in the underlying factors that may affect nutritional status. See Annex 1.

Application of the conceptual model

The conceptual model highlights the complexity of the multiple connected elements that can influence nutritional status at different levels – immediate, underlying and basic – highlighting that it is not just a food, nor health, nor care issue. This promotes a broader understanding of factors impacting on nutrition status and encourages needs assessments to look beyond just the food needs of a population. During an emergency, the conceptual model can be used as a checklist to identify and prioritise the short and long term needs and gaps in services for the population and in particular for the identified vulnerable groups. This is based on the assumption that a population requires care, food security, adequate health services and a healthy household environment in order to be protected from disease and malnutrition. If these are unavailable they need to be provided. This will help ensure that available resources are used effectively.

Case example 1 highlights the importance of understanding the factors impacting on nutrition at the different levels in order to address undernutrition effectively.

[2] Adapted from: Lancet series on Maternal and Child Undernutrition 2008 and United Nations Children's Fund (1997), Conceptual framework for analysing the causes of malnutrition, UNICEF, New York.

Case example 1: Chronic Vulnerability in Niger 2006[3]

The people of Niger have suffered from chronic vulnerability and high levels of *acute malnutrition* over the years. In 2006 a study reported that the lack of improvement in nutrition status was partly attributed to the limited understanding of malnutrition among the stakeholders at the higher level.

The report suggested that in order for the nutrition situation to improve the following was required:

a) Incorporate more nutrition information and surveillance into the *early warning system*.

b) To use the UNICEF conceptual framework to help broaden and strengthen the understanding of the factors impacting on the nutrition situation beyond food production and grain availability to include access to health, cultural practices and gender issues. With an improved understanding organisations could respond more effectively.

The UNICEF conceptual framework is widely accepted as a useful tool to help understand the different levels of causality and the multiple connected factors that impact on nutritional status. Because of this shared understanding it has the potential to foster collaboration and bring organisations together to exchange information. This will strengthen the understanding of a situation and promote consensus on the priority of needs.

Case example 2 demonstrates the potential of the framework to encourage collaboration among stakeholders.

Case example 2: UNICEF Framework fosters collaboration in Afghanistan[4]

Nutrition survey data indicated that severe wasting among women and children less than 5 years was endemic in Afghanistan. A study between May 06 and February 07 was conducted in 4 locations in Afghanistan to examine the varied perspectives of the food and nutrition situation among the diverse stakeholders at all levels. The UNICEF conceptual framework was used to help the stakeholders describe the nutrition situation at the different levels.

The factors that impacted on the nutrition situation that were raised by the stakeholders were diverse and with differing priorities and included some of the following: the community key informants and provincial and national stakeholders frequently highlighted nutrition knowledge as a constraint to improving the nutrition situation. However, men and women's focus groups did not perceive knowledge as a constraint. Underlying causes of malnutrition emphasised by the health sector focussed on health issues and likewise the agricultural sector focussed on agricultural issues. The responses were largely dependent on the individual's level of involvement and their particular area of expertise. This lack of consensus concerning prioritisation of interventions among stakeholders affected policy development and programme planning priorities because of the lack of clarity and consensus as to where resources should be invested.

Using a locally adapted version of the UNICEF framework facilitated the inclusion of the community viewpoints in the process of policy development. These perspectives where often omitted by policymakers who frequently lack direct contact with community level stakeholders. The process helped to foster improved collaboration between the agricultural and health sector and build consensus concerning the nutrition situation and to prioritise short and long term interventions.

In addition, the conceptual model provides a structure to organise the mass of *cross-sectional data* on factors impacting on the nutrition situation frequently collected during food and nutrition surveys.

Limitations of the Conceptual Model

The conceptual model is not an assessment tool, it does not provide standard methods to assess factors impacting on nutrition.

[3] Field Exchange, Dec 06, Issue 29, Borrel. A, Summary of published research

[4] Field Exchange, November 09, Issue 37, Levitt. E.

Case example 3: Quality and potential use of data collected during nutrition surveys: An analysis of surveys in Ethiopia[5]

Humanitarian agencies regularly conduct nutrition surveys to estimate the prevalence of severe wasting and *death rates*. At the same time a wide range of factors that are expected to impact on the nutrition situation are frequently collected in order to assist with identifying needs and programme priorities.

A recent study examined 291 nutrition surveys conducted in Ethiopia between 2003 and 2008. The data collected during nutrition surveys included more than 40 indicators related to health, caring practices, food security and *coping strategies*.

The data collected on these indicators were inconsistently asked, recorded, classified, analysed and reported. It was therefore not possible to compare information between the surveys or to interpret the data with any level of certainty.

A future challenge is to agree upon an appropriate methodology that outlines the data to collect, how to collect the data and how to analyse it. This would improve standardisation to describe humanitarian situations, offer insights into thresholds for interventions, indicate priorities for assistance and allow data to be compared within and between countries.[6]

Case example 3 highlights the limitations of non-standardised cross-sectional data collected during food and nutrition surveys.

The Conceptual model does not take into account individual factors, such as genetic factors, that affect nutritional status, including susceptibility to disease, *heterogeneity* in nutritional pathways such as *metabolic rates* that influence the rate at which *energy* is consumed or phenotypic factors. Because of these differences, children may not all respond in the same way to treatment and it is not possible to know how the children will differ.

The conceptual model does not take into account how the different factors that impact on nutrition may be affected by seasonality.

Cross-sectional data collected during food and nutrition surveys

Frequently during *anthropometric surveys* cross-sectional data is collected in order to identify and better understand the many factors that influence the nutrition situation of the population. This information can be used for identifying needs and prioritising programmes.

Case example 4: Nutrition Causal Analysis: Planning and Credible Advocacy[7]

A nutrition causal analysis conducted in 2002 in Mandera Central in northern Kenya provided a multi-sectoral overview of factors affecting nutrition status within an urban community that had suffered from chronic poverty as well as successive droughts. This analysis incorporated the perspectives of stakeholders working at different levels of the current nutrition situation.

The information collected and analysed during this causal analysis provided the following benefits:

a) Additional information in order to strengthen targeting, identify short and long term programme priorities, which highlighted the need for integrated programmes.
b) Reinforced technical information and therefore strengthened its credibility.
c) Encouraged inclusion of relevant additional information into the national early warning system.
d) Helped to explain why certain nutrition situations were not improving even though there had been several interventions over the years.
e) Assisted with developing a credible advocacy document for donors.

However, it was also recognised the causal analysis may become less relevant and out dated if circumstances change and therefore the information would be less useful for programme planning and advocacy.

[5] Watson, F., Bekele, N., Dolan, C., Shoham, J. and Hall, A. (2011). The quality and potential use of data collected during nutrition surveys: an analysis of surveys in Ethiopia. International Health, in press

[6] ACF is currently undertaking a study in order to develop a methodology to collect cross-sectional information on factors impacting on nutrition at the different levels.

[7] Field Exchange, March 2003, Issue 18, Paul Rees-Thomas

Case example 4 for illustrates how cross sectional data can be used to strengthen programming and advocacy strategies.

Cross-sectional data cannot be used to explain how an individual came to be malnourished. Cross-sectional data indicates an association but this does not necessarily mean causation. To show causation, individuals need to be followed over time to see what factors are associated with malnutrition. This isn't possible during an emergency for ethical reasons. In addition, multiple factors present at the same time and they cannot easily be disassociated, while the causes of malnutrition before and after an emergency may be different. Because both the possible causative factor and malnutrition are measured at the same time during a cross-sectional survey it is not possible to know which came first: whether the factor caused malnutrition or whether malnutrition predisposed individuals to the factors.

Case example 5 highlights how the conceptual framework helped to strengthen a programme but at the same time recognised the difficulties of identifying the causes of malnutrition among children.

Case example 5: Review of integrated nutrition programming by Action Contre la Faim (ACF) International.[8]

ACF commissioned a review of their integrated nutrition programmes. The UNICEF conceptual framework helped demonstrate the benefits of an integrated approach to address malnutrition and helped the different technical sectors appreciate the importance of links with each other. Integration began during the needs assessment. During this phase overlaps in terms of beneficiaries, activities and messages were identified. Two main programme components could be integrated as they cut across several technical sectors: behaviour change and communication, and monitoring and evaluation. Having separate units for these 2 programme components ensured consistency, reduced costs and, for the monitoring and evaluation, a degree of objectivity and impartiality could be achieved. The benefits of using the UNICEF conceptual framework to strengthen programming were recognised.

However, ACF also recognised that the UNICEF Conceptual Framework cannot be used to determine how any given child came to be wasted or to estimate the balance of proportionality that is required between interventions in different sectors to prevent malnutrition.

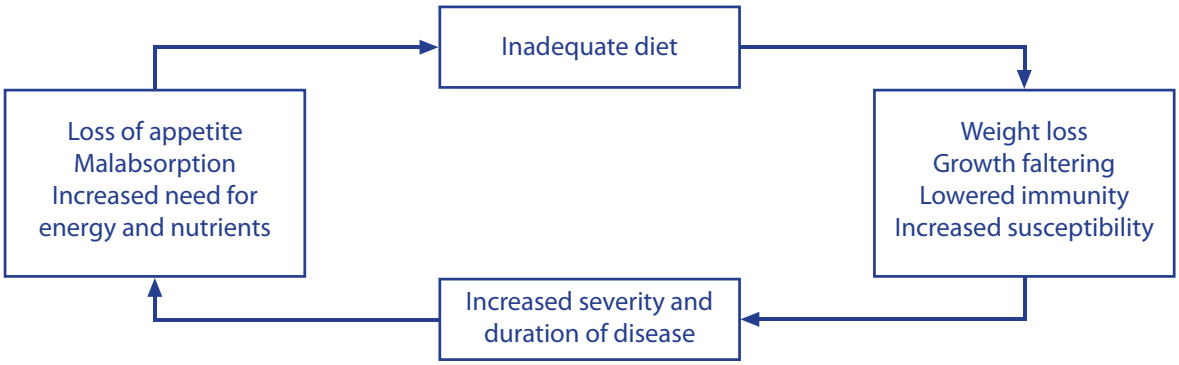
Immediate causes of malnutrition

Infection-malnutrition cycle

The immediate causes of malnutrition are an inadequate diet and disease. The manifestation of malnutrition is due to the difference between the amount of nutrients absorbed from food and the amount of nutrients required by the body. This happens as a consequence of consuming too little food or having an infection, which increases the body's requirements for nutrients, reduces appetite, or affects the absorption of nutrients from the gut.

In practice, malnutrition and infection often occur at the same time. Malnutrition can increase the risk of infection, while infection can cause malnutrition leading to a vicious cycle. A malnourished child, whose resistance to illness is poor, falls ill and becomes more malnourished, which reduces his capacity to fight against illness and so on. This is called the infection-malnutrition cycle and is illustrated in **Figure 2** below.

Figure 2: The infection-malnutrition cycle[9]



[8] Field Exchange, Issue 37, November 09, Dolan. C et al.

[9] Based on Andrew Tomkins and Fiona Watson, ACC/SCN Geneva 1989

Table 1: Summary of interactions between malnutrition and major diseases[10]

Disease	Impact of malnutrition on disease	Impact of infectious disease on nutritional status
Diarrhoea or dysentery (e.g. shigellosis)	• Increased duration • Increased severity • Increased risk of dying	• Malabsorption • Appetite loss
Acute Respiratory Tract Infections	• Increased severity • Increased risk of dying	• Appetite loss • Increased metabolic rate resulting in muscle breakdown.
Measles	• Increased duration • Increased severity, especially if deficient in vitamin A • Increased risk of dying	• Appetite loss • Decreased levels of plasma vitamin A • Prolonged *immune suppression* resulting in increased risk of ARI and diarrhoea • Increased metabolic rate resulting in muscle breakdown. • Loss of proteins into the gut
Malaria	• Some evidence of increased severity in deficiencies of vitamin A and zinc	• Appetite loss • Increased metabolic rate • Destruction of red blood corpuscles leading to *anaemia* • Impaired foetal development, low birth weight

Most deaths (mortality) during an emergency are caused by diarrhoeal diseases, *acute respiratory infections, measles* and malaria. These diseases often occur together with malnutrition. Infections interact in various ways with nutrition. The interaction depends on the infection itself and on the extent of malnutrition. People infected with HIV are at particular risk of infection: see Module 18 for a fuller description. **Table 1** shows how the major diseases in emergencies interact with nutrition.

Underlying causes of malnutrition

The underlying causes of malnutrition can be grouped under the three broad categories: inadequate household food security, inadequate care and inadequate health services and an unhealthy household environment, such as lack of access to safe water and effective sanitation. The three categories are interrelated, and actions affecting one area may have significant consequences on another. For an individual to be adequately nourished, all three need to be addressed. Decisions made at the household level with regards to these three categories are influenced by many factors such as culture, available assets including time, income, education and available land and livestock etc. In vulnerable households decisions are often a trade-off, for example deciding to spend the limited available income on agricultural inputs may result in money not being available for health care.

Inadequate household food security

Food security exists when all people at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.[11] The three main components of food security are:

- Availability – Sufficient quantity of appropriate food is physically available. The food may come from household production, commercial imports or food assistance.
- Access – Income or other resources are adequate to obtain sufficient and appropriate food through home production, buying, bartering, gathering etc. Food may be available but not accessible to people who do not have adequate land to cultivate or enough money to buy it.
- Utilisation – Food is properly used through appropriate food processing and storage practices, adequate knowledge and application of nutrition and child care principles, and adequate health and sanitation services. Utilisation includes how food is shared within the household compared with each person's nutrient requirements. Utilisation also includes biological use, which is linked to a person's health.

[10] Based on malnutrition and infection – a review- Nutrition policy discussion paper No5. ACC/SCN June 93

[11] From the World Food Summit in 1996

Case example 6: How the global food crisis is hurting children[12]

In November 2008, Save the Children UK examined how the global food crisis affected different sectors of a rural community in northern Bangladesh. It was evident that the rise in global food prices had a damaging impact on the nutrition situation of the poorest households in these communities. After food prices reached their peak in 2008, between 32% and 50% of households had a lower disposable income. The percentage of households doubled that were unable to afford a diet that met their energy requirements. The poorest families were even less able to afford a diet that provided macro and *micro nutrients* essential for good health and nutrition. Children from the poorest households received fewer meals per day, had less diverse diets and were less likely to receive nutritious foods. To cope with the rise in rice prices damaging strategies were adopted such as sending children to work, selling assets, eating less etc.

Other key parts of the definition for food security are:

- **'At all times'** – this refers to the seasonal aspect of sources of food and income and of problems that could affect households.
- **'All people'** – there are differences within communities; not all households have the same access to food and income earning opportunities, or to health care and sanitation.

For more detailed information on the food security refer to module 9.

In emergencies the way people obtain food is often disrupted. Emergencies can destroy food stocks in the home and warehouses, as well as affecting land where crops are grown. Markets for food, livestock and labour can be disrupted, as can usual sources of household income. Overall availability can be reduced causing serious food shortages.

Some major famines have been caused by market shocks e.g. rapid price increases which have resulted in an inability to buy food because of high inflation rates.

Case example 6 indicates how rising food prices can negatively impact on food security and the nutrition situation.

Inadequate Care

Caring practices are the way the vulnerable, such as children, the elderly and the sick, are fed, nurtured, looked after, taught and guided. This is the responsibility of adults and of society. Both formal and informal systems of care may exist through institutional care and family networks. Caring practices are determined by cultural factors and by resources, such as income, time and knowledge. The values of society strongly influence the priority given to the care of vulnerable people. Attitudes to modern health services, water supplies and sanitation also affect caring practices. The care of vulnerable groups is particularly linked with the status, responsibilities, power and education of women, which may be culturally dependent. The unequal division of labour and resources in favour of men affects the well-being of both women and children.

Children and other vulnerable people are at particular risk as they are dependent and unable to care for themselves. All vulnerable groups should be identified at the onset of a crisis and their needs assessed. The needs and gaps in services for a particular vulnerable group may be specific and unique to that group.

Case example 7: Poor caring practices among refugees in Algeria in 2004.[13]

Many Saharawi people had been living in refugee camps in the desert of south-western Algeria for over 40 years, dependent on external assistance. The cultural factors affecting breastfeeding, complementary feeding practices and adult eating habits had led to a range of nutritional disorders. Few young infants were given only breast milk: against nutrition advice they were often given tea and water in the first few weeks of life. Sugar was added to the weaning foods which provided energy and no other nutrients. Men within this culture considered large women more attractive than thin women. This encouraged women to eat a lot of sugary foods and they became overweight. The women also drank large amounts of tea, which inhibits iron absorption, so they became anaemic. The cultural norms of care practices in this community had contributed to chronic public health concerns.

[12] How the global food crisis is hurting children. The impact of the food price hike on a rural community in Bangladesh, 2009, Save the children, UK

[13] Frize, J. (2004), 'UNHCR internal report', UNHCR, Geneva.

Case example 8: Poor health environment in the Democratic Republic of Congo (DRC)

Civil unrest in the DRC caused displacement and food insecurity for many people. A nutrition survey was conducted at the end of 2006 in Maniema province after the harvest when the nutrition situation should theoretically be at its best in the year. The results indicated 11.3 per cent of children were wasted and 3.2 per cent were severely wasted. The death rate among children less than 5 years was estimated to be 2.07/10,000/day, which is high. These rates were thought to be due to poor access to quality health care due to inadequate staffing and medical supplies and high fees charged for the consultation and treatment. Only 0.9 per cent of children surveyed had evidence of having had a measles vaccination, although 50 per cent claimed to have been vaccinated. The seasonal pattern of disease in this region requires a working health care system to maintain a healthy population and to avoid increased *incidence* of undernutrition.

However, understanding and collecting data on the role of caring practices and how it influences nutrition status is particularly difficult, intrusive and time consuming especially when "normal" caring practices may be disrupted during an emergency.

Case example 7 indicates how caring practices can impact on nutrition status.

Feeding children

While exclusive breastfeeding provides nourishment and protects children from infection, most children need additional or *'complementary'* food from about six months of age to ensure good health and growth. A young child's first foods are determined by a family's financial situation as well as by cultural norms, and therefore vary greatly. Changing the diet from breast milk to family food is time-consuming and requires care with food hygiene and preparation. During an emergency a mother may have little time, poor access to appropriate weaning foods and poor facilities to prepare such foods. Module 17 discusses infant and young child feeding in greater detail.

Protecting children's health

In order for children to thrive they require health care, especially immunisations. How and where parents seek such services will depend on their knowledge, the quality and distance of health services and cultural practices. As health services may be disrupted during an emergency, carers may have limited or no access to health care so are less able to protect their children's health.

Psycho-social behaviour

Children need emotional support and cognitive stimulation as well as food in order to grow and develop properly. This psycho-social support must be sustained during an emergency.

Caring for pregnant and breastfeeding women

The need for good-quality food, respite from strenuous labour, time to rest, and access to health care from trained practitioners increases among pregnant and breastfeeding women. In emergencies it should be ensured that these special needs are provided for so that pregnant and breastfeeding women can care effectively for their young children and provide adequate nourishment for their unborn children.

Inadequate health services and an unhealthy household environment

Health care services

Health care refers to access to the treatment and prevention of disease. An essential element of good health care is access to affordable, good quality curative and preventative health services and a healthy household environment. Effective treatment can reduce the duration and the severity of infection and lower the risk of infecting other people. But access to health services is determined by physical distance and cost, which includes the cost of transport, consultation and medical treatment costs as well as the cost in time to attend a clinic and leave other tasks not done. Poor quality health services may put people off, who then delay treatment until the disease is serious and the outcome of the treatment may be less successful. During an emergency health services may be limited because there are no medical staff or medical supplies.

Case example 8 illustrates the impact of an emergency on health.

Unhealthy household environment

An unhealthy household environment refers to the lack of enough safe water, no effective sanitation systems and unhygienic conditions. Such an environment will increase the likelihood of the spread of *infectious diseases*. An unhealthy household environment can lead to an increased incidence (new cases) of disease. Disease then reduces the capacity of adults to work and increases the amount of time they spend caring for sick members of their family.

In emergencies the household environment often deteriorates rapidly and access to adequate clean water and effective sanitation may be lost. Living in overcrowded camps with a poor health environment can lead to the spread of infectious disease and a rise in malnutrition rates among the population.

The well-being of people is also affected by the quality of their shelter and by cold and stress.

Case example 9: Participatory study of impact of the global crises on the poor[14]

A study was conducted in February 2009 to examine the impacts and responses to the food, fuel and financial crises in poor rural and urban communities in Bangladesh, Indonesia, Kenya, Jamaica and Zambia.

The global financial crisis hit when the shock of the high food and fuel prices was still being felt. People had not yet recovered from the rapid rise of the food and fuel prices, many prices remained high and fluctuation created uncertainty.

The study showed that *livelihood* adaption had been swift, but into low-yield or dangerous activities. Eating less frequently, and less diverse and nutrient rich diets was reported. The number of children attending school appeared to be on the decline as children were being withdrawn from school and entering work and there were a growing number of children and young girls selling themselves for sex.

Community-based support was largely inadequate and government programmes were largely insufficient. Household income was insufficient and there were indications that the frequency of domestic violence was increasing. Petty crime, drug and alcohol abuse were also on the increase.

Basic causes

Political, economic, legal and ideological factors (including religion, culture and tradition) may defeat the best efforts of people to attain good nutrition. For example, these include the degree to which the rights of women and girls are protected by law and custom; the control that women have over resources; the political and economic systems that determine how income and assets are distributed; and the ideologies and policies that govern social sectors.

The global increases in food and fuel prices were felt around the world. The impact of these increases on the poorest meant difficult decisions had to be made. Their already limited household budget was not always sufficient to meet the most basic needs and the increased global prices put a further strain on that budget. Some of the strategies adopted such as eating less food, missing a meal and eating a less diverse diet during this time would probably have a detrimental impact on their nutrition status.

Case example 9 discusses how global increases in fuel and food prices impact on the poor.

The physical environment which communities inhabit may have a significant impact at the basic level on their nutrition status. Chronic emergencies often occur in places with a challenging physical environment (such as frequent droughts, unreliable rainfall, intense heat etc.). For example, in northern Kenya, unacceptable levels of wasting among children under-5 years are regularly recorded and this can partly be attributed to the challenging physical environment (high annual temperatures, limited rainfall, dusty, remote) of this area.

The economic, political, social and ideological context determines how the available resources are used, distributed and consumed and influences who benefits from income generated from these resources. The political context refers to the function of the state and includes taxation and subsidisation policies and the enforcement of the legal system.

Overcoming entrenched poverty and underdevelopment requires knowledge, skills and resources. If the basic causes of malnutrition are to be addressed, greater and better-targeted resources and improved collaboration between all development partners at all levels are needed. Above all, the poor themselves must be a major part of the process. This is true of both emergency and non-emergency situations.

Political discrimination due to religion, race or clan can lead to systematic marginalisation and exclusion from food and other available relief services and is one of the basic causes of malnutrition. In emergencies such groups may be too frightened to claim food aid or their needs are ignored or unheard by the decision makers. Without a representative with authority among the decision makers their needs may remain unmet. In emergencies, the injustices of the overall system are often exacerbated and can lead to the nutritional status of minority groups deteriorating rapidly.

Case example 10 explores how the entrenched marginalisation of certain groups by key decision makers in India impacts on their nutrition status.

Economic marginalisation and poverty are also some of the basic causes of malnutrition in many emergencies. In some countries prone to disasters such as flooding, the poorest members of society are often the most badly affected as they live in areas that are remote and poorly serviced, where national rescue services may be limited. They may also have few resources to protect them from the effects of an emergency.

[14] Field Exchange, November 2009, Issue 37, IDS.

Case example 10: Addressing poverty and undernutrition in India.[15]

A study compared and contrasted the situation in West Bengal state, where poverty rates declined between 1993 and 2005, with Orissa state where the range of poverty indicators increased over the same period.

In Orissa reports of malnutrition are typically denied at first by state officials and reactions are slow and often prompted by central government rather than state officials. The responses are usually emergency-orientated rather than addressing one of the important factors affecting the nutrition situation which is a deep rooted discrimination and exclusion of the lower castes and tribes. The interests of such deprived groups remain under-represented on the political scene at state level despite extensive national policy frameworks to protect such groups. This has resulted in large numbers of marginalised groups remaining in poverty and with high levels of malnutrition.

However, In West Bengal state the decentralisation of power has been seen as the foundation for equitable development. Resources and responsibilities have been successfully decentralised closer to the community resulting in a more accountable system.

The situation in Orissa highlights that poverty and undernutrition are part of a much broader development failure, rooted in deep social and political inequalities.

Climate change directly affects the food and nutrition security of millions of people, which is undermining current efforts to address undernutrition. There are many ways in which climate change will impact negatively on the nutrition situation for example climate change will impact on food security, the quality of food crops, access to safe water for drinking as well as water for agricultural purposes and health, as diseases shift to new areas. The United Nations Standing committee on Nutrition (UNSCN) recognises that "comprehensive short and long term approaches are needed to preserve and improve nutrition security while addressing climate change. Strategies to respond to climate change through adaptation, mitigation, finance, technology, and capacity building should properly take into account the impact of climate change and nutrition security"[16]

Case example 11 highlights the urgency to invest in guarding against the global impact of climate change on food security.

Conclusion

The conceptual model illustrates that an individual's nutritional status is a result of an inadequate diet and disease: these are referred to as the immediate causes. These immediate causes in turn, are dependent on adequate household food security, adequate care and adequate health services and a healthy household environment such as access to safe water and effective sanitation services and are referred to as underlying causes. Underlying causes are dependent on the wider social, political and economic context as well as the natural physical environment: these are referred to as basic causes and impact on society in general.

Malnutrition and infection often occur at the same time. Malnutrition can increase the risk of infection while infection can cause malnutrition leading to a vicious cycle referred to as the infection-malnutrition cycle.

Case example 11: Moderating the impact of climate change[17]

A study in 2008 reviewed adaptations to guard against the global impact of climate change on food security. It concluded that relatively inexpensive changes such as shifting planting dates and switching to an existing crop variety, may moderate negative impacts. But the biggest benefits will probably result from more costly measures such as development of new crop varieties and irrigation expansion.

The analysis points to many cases where food security is clearly threatened by climate change in the relatively near term such as South Asia and southern Africa. The impact of climate change will probably vary substantially within individual regions according to differences such as biophysical resources and management.

[15] Field Exchange, Issue 37, November 09, De Haan. A.

[16] UNSCN Climate change and nutrition security. Message to the UNFCCC negotiators. December 2010

[17] Field Exchange, issue 33, June 08, Lobell. D.

The conceptual model highlights that malnutrition is not caused just by insufficient food intake. It demonstrates the complexity of connected factors that impact on nutrition at different levels.

These factors can be used as a checklist to identify and prioritise short and long term needs, identify gaps in services and thus ensure that resources are used effectively.

However, the conceptual model is not an assessment tool and does not provide standardised methods to assess factors impacting on the nutrition situation. A future challenge is to agree upon a set of core data that can provide indicators of aggravating factors to describe the humanitarian situation, offer insights into thresholds for interventions, indicate priorities for humanitarian assistance and allow data to be compared within and between countries. In addition, it should be remembered that cross-sectional data are not able to determine the causes of malnutrition. Cross-sectional data indicates an association but this does not necessarily mean causation.

Annex 1: Sample seasonal calendar

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
RAINFALL		LIGHT	LIGHT	LIGHT		HEAVY	HEAVY	HEAVY				
STAPLE CROP HARVEST												
MARKET PRICE INCREASE FOR STAPLE CROP												
CASH CROP HARVEST												
LIVESTOCK GRAZING AND CROP RESIDUE AVAILABILITY												
AGRICULTURAL LABOUR DEMAND												
HUMAN DISEASES	DIARR-HOEA	MALA-RIA	MALA-RIA			ARI	ARI	ARI			DIARR-HOEA	DIARR-HOEA
FOOD STORES AT HOME												

This is an example of a seasonal calendar clearly showing the changes in the calendar year that can affect availability and access to food in relation to rainfall patterns and the agricultural seasons, as well as livestock welfare related to fodder and water availability.

The price of the staple food in the market typically increases just before the harvest when stocks tend to be low.

Agricultural labour demand is related to the agricultural season, and related to the health status of workers whose work capacity can be affected by seasonal disease patterns. The calendar can help demonstrate that January and February are difficult months for households relying on agriculture for their livelihood because the price of the staple is high in the market, there is limited grazing availability for animals and the dry season may cause an increase in expenditure on animal health care services. In addition, January and February see higher levels of diarrhoea due to the dry season and the onset of the rains brings malaria, possibly affecting household health and increasing expenditure on medicine. These are the months when malnutrition is more likely to increase.

Calendars are useful tools to understand when different underlying causes are most likely to affect the immediate causes.