

PART 1: FACT SHEET

The fact sheet is the first of four parts contained in this module. It provides an overview of key information on the prevention and treatment of micronutrient malnutrition. Detailed technical information is covered in Part 2. Words in *italics* are defined in the glossary.

Introduction

Micronutrient malnutrition is caused by an inadequate or excessive intake of one or more vitamins or minerals. Deficiency diseases that result include *scurvy*, *pellagra*, *beriberi*, *anaemia*, *iodine deficiency disorder*, *xerophthalmia* and *rickets*. All of these have occurred and reoccurred in emergency contexts within the last two decades.

As well as directly causing *morbidity* (illness) and *mortality* (death), micronutrient deficiencies also lead to growth retardation, impaired immunity and an increase in the severity of infectious disease. Infectious diseases can, in turn, worsen the problem of an inadequate diet and initiate a vicious cycle that connects infection and malnutrition.

Problems of inadequate intake combined with high rates of infections are commonly found in emergencies. For these reasons, it is essential that effective strategies to combat micronutrient malnutrition are developed and implemented in emergency situations.

Although the problem is much less common, excessive intakes of micronutrients can also be harmful. For example, in the case of iodine, *goitre* may develop in people who have either too little or too much iodine in their diet. Most micronutrients have a defined safe upper level of intake. Regular consumption above this level carries a health risk. For these reasons, it is important that strategies for reducing micronutrient malnutrition ensure that intakes remain within recommended levels.

Prevention

There is no one single approach to prevention that will be effective in all emergency contexts. However, it is possible to identify 11 approaches to prevention and to select from these a combination that will form an effective strategy. These approaches are:

1 Inclusion of nutrient-rich commodities in food aid rations

Food aid rations are often composed of only a few commodities and are therefore likely to be deficient in a number of micronutrients. Particular commodities can, however, be a good source of certain micronutrients. For example, ground nuts (peanuts) are a good source of *niacin* (vitamin B3). Including commodities that are available and a good source of micronutrients can be an effective, rapid, and cost-effective approach to improving food aid rations.

2 Provision of fresh food items that are complementary to a general ration

A basic food ration often contains a cereal, pulse, oil, salt and a blended food. This is often nutritionally deficient but the quality can be improved by the addition of complementary food items such as spices, and fresh vegetables and fruit. Refugee operations involving UNHCR and WFP are guided by a memorandum of understanding (MOU) between the two UN agencies. Under this MOU, complementary food items should be supplied by UNHCR when the need for them has been established by a joint assessment mission. However, the logistic, resource and management challenges involved in procuring and distributing complementary food commodities often means that provision is erratic.

3 Provision of micronutrient-fortified foods

The increasing introduction of micronutrient-*fortified foods* in food rations, and especially blended food, since the mid-1990s, has probably helped to prevent major micronutrient deficiency outbreaks. Cereal flours may be fortified with B vitamins, oil is usually fortified with vitamin A, salt should usually be fortified with iodine, and blended foods should include a broad range of added micronutrients.

4 Increasing the size of the general food ration to facilitate diet diversification by exchange or trade

Increasing the size of the general ration may provide beneficiaries with additional foodstuffs that can be bartered or traded in exchange for foods and result in a more diversified diet. This approach may be particularly useful when there are inadequate supplies of micronutrient-rich food aid commodities, and the beneficiaries have access to markets where micronutrient-rich foods are available.

5 Distribution of food supplementation products for home fortification

A relatively new approach involves supplying specialized *food supplementation products* to beneficiaries for them to add to a household or child's diet to improve the micronutrient content. These products include micronutrient powders (e.g. 'Sprinkles™') and *lipid nutrient supplements*. Operational experience with these approaches in emergencies is, so far, fairly limited and important questions remain over how recipients will use the products under these conditions.

6 Distribution of micronutrient supplements

The distribution of micronutrient supplements in the form of capsules and tablets is a key approach in combating micronutrient malnutrition. Vitamin A capsules for children and iron and folic acid tablets for pregnant women are well established routine components of most public health programmes. The use of multiple micronutrient tablets may gain in popularity but evidence of their benefits is currently inconclusive. Universal iron supplementation for children in *malaria* affected areas is not currently recommended. However, the treatment of children diagnosed with iron deficiency anaemia should continue, whether they reside in a malaria affected area or not.

7 Promotion of home gardening and agricultural development

The distribution of seeds, tools and other agricultural inputs may allow populations to grow vegetables and fruit or livestock for home consumption or for sale. However, access to land may be a major constraint, particularly in refugee camps or in areas which are insecure, e.g., due to land mines. Access to adequate water may also be a limiting factor.

8 Increasing income generation and improving access to markets

Increasing household income can help to improve the dietary intake of micronutrients by increasing diet diversity. Micro-credit, enterprise development and improving market access may help in the process. However, it should be remembered that the most vulnerable households and individuals may be the ones least likely to benefit from these types of interventions.

9 Promotion of recommended infant and young child feeding practices

Promotion of *exclusive breastfeeding* and appropriate *complementary feeding* practices are critical public health interventions that also contribute to maintaining micro-nutrient status. Exclusive breastfeeding up to about six months of age, followed by the introduction of age-appropriate, nutritionally adequate and safe complementary foods with continued breastfeeding, are very important for the nutritional status and health of children. Complementary foods for infants should be rich in energy and micronutrients, as the growing child requires these for successful growth and development.

10 Ensuring adequate health care and a healthy environment

Good health is very important in maintaining good nutrition and micronutrient status. Examples of public health interventions that may contribute to preventing micronutrient deficiencies include measles vaccination, provision of good sanitation, hygiene promotion including hand washing, and programmes to control malaria.

11 Ensuring access to adequate non-food items

Household economic decisions are critical in determining the diet diversity and micronutrient status of all its members. If households are short of non-food items (e.g., cooking pots, soap or assets such as tools) then they may choose to use available food stocks or assets to buy these, rather than to improve the quantity or quality of their diet. Micronutrient deficiencies may result.

Treatment

Micronutrient deficiency diseases require urgent medical treatment. This will usually take the form of oral supplement tablets or capsules. A relatively new and effective approach involves using micronutrient powders (e.g. 'Sprinkles™' that can be added to normal food to increase micronutrient intake. The appropriate supplements should be made available as part of an essential drugs package.

Appropriate diagnosis and treatment of cases of micronutrient deficiency will significantly reduce the burden of morbidity and mortality. Effective treatment should always be accompanied by the development of a prevention strategy using the different approaches outlined above.

Key messages

1. Prevention of micronutrient malnutrition depends on achieving an adequate intake of the many micronutrients (vitamins and minerals) required by the human body.
2. Diseases can increase the requirements for micronutrients and can interact with malnutrition to cause morbidity and mortality.
3. Effective control of micronutrient malnutrition is likely to involve both curative and preventive approaches.
4. Options for the prevention of micronutrient malnutrition in emergencies can be classified into 11, often complementary, approaches:
 - 1) Inclusion of nutrient-rich commodities in food assistance rations
 - 2) Provision of fresh food items that are complementary to a general ration
 - 3) Provision of micronutrient-fortified foods
 - 4) Increasing the size of the general food ration to facilitate diet diversification by exchange or trade
 - 5) Distribution of food supplementation products for home fortification
 - 6) Distribution of micronutrient supplements
 - 7) Promotion of home gardening and agricultural development
 - 8) Increasing income generation and improving access to markets
 - 9) Promotion of recommended infant feeding practices
 - 10) Ensuring adequate health care and a healthy environment
 - 11) Ensuring access to adequate non-food items
5. An effective prevention strategy with long-term impact is likely to use a combination of these different approaches. Not all approaches can be used in all situations. For example, there may be no general food aid ration in some situations or there may be no spare land or water available for home gardening in others.
6. To treat a specific micronutrient deficiency disease high dose supplementation using a single or small range of micronutrients is usually required. This treatment should be accompanied by a good general diet and appropriate health care.
7. Micronutrient malnutrition can result from a deficiency or an excess of micronutrients. In designing any programme the possibility of excessive intakes of micronutrients needs to be considered.

