World Health Organization

World Food Programme

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Joint statement by the World Health Organization, the World Food Programme and the United Nations Children's Fund

Preventing and controlling micronutrient deficiencies in populations affected by an emergency

Multiple vitamin and mineral supplements for pregnant and lactating women, and for children aged 6 to 59 months

BACKGROUND

Deficiencies of micronutrients are a major global health problem. More than 2 billion people in the world today are estimated to be deficient in key vitamins and minerals, particularly vitamin A, iodine, iron and zinc. Most of these people live in low income countries and are typically deficient in more than one micronutrient. Deficiencies occur when people do not have access to micronutrient-rich foods such as fruit, vegetables, animal products and fortified foods, usually because they are too expensive to buy or are locally unavailable. Micronutrient deficiencies increase the general risk of infectious illness and of dying from diarrhoea, measles, malaria and pneumonia. These conditions are among the 10 leading causes of disease in the world today (*1*).

The groups most vulnerable to micronutrient deficiencies are pregnant women, lactating women and young children, mainly because they have a relatively greater need for vitamins and minerals and are more susceptible to the harmful consequences of deficiencies. For a pregnant woman these include a greater risk of dying during childbirth, or of giving birth to an underweight or mentally-impaired baby. For a lactating mother, her micronutrient status determines the health and development of her breast-fed infant, especially during the first 6 months of life. For a young child, micronutrient deficiencies increase the risk of dying due to infectious disease and contribute to impaired physical and mental development.

MICRONUTRIENTS IN EMERGENCIES

Micronutrient deficiencies can easily develop during an emergency or be made worse if they are already present. This happens because livelihoods and food crops are lost; food supplies are interrupted; diarrhoeal diseases break out, resulting in malabsorption and nutrient losses; and infectious diseases suppress the appetite whilst increasing the need for micronutrients to help fight illness. For these reasons it is essential to ensure that the micronutrient needs of people affected by a disaster are adequately met. For this to happen it is critical that general food-aid rations are adequate and well balanced to meet nutrient needs, and that they are distributed regularly and in sufficient quantities.

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One way to meet the recommended daily intake of micronutrients is to provide foods fortified with micronutrients (*2–3*). Fortified foods, such as corn-soya blend, biscuits, vegetable oil enriched with vitamin A, and iodized salt, are usually provided as part of food rations during emergencies. The aim is to avert micronutrient deficiencies or prevent them from getting worse among the affected population (*4*). Such foods must be appropriately fortified, taking into account the fact that other unfortified foods will meet a share of micronutrient needs.

However, foods fortified with micronutrients may not meet fully the needs of certain nutritionally vulnerable subgroups such as pregnant and lactating women, or young children. For this reason UNICEF and the WHO have developed the daily multiple micronutrient formula shown in Table 1 to meet the recommended nutrient intake[1] (RNI) of these vulnerable groups during emergencies (*2, 3, 5*).

Table 1. The composition of multiple micronutrient supplements for pregnant women, lactating women, and children from 6 to 59 months of age, designed to provide the daily recommended intake of each nutrient (one RNI)

Micronutrients	Pregnant women[a]	Children (6–59 months)[a]
Vitamin A µg	800.0	400.0
Vitamin D µg	5.0	5.0
Vitamin E mg	15.0	5.0
Vitamin C mg	55.0	30.0
Thiamine (vitamin B1) mg	1.4	0.5
Riboflavin (vitamin B2) mg	1.4	0.5
Niacin (vitamin B3) mg	18.0	6.0
Vitamin B6 mg	1.9	0.5
Vitamin B12 µg	2.6	0.9
Folic acid µg	600.0	150.0
Iron mg	27.0[b]	5.8
Zinc mg	10.0	4.1
Copper mg	1.15[c]	0.56[c]
Selenium µg	30.0	17.0
Iodine µg	250.0[d]	90.0

[a] See ref. *3*; [b] see ref. *5*; [c] see ref. *13*; [d] See ref. *14*

Pregnant and lactating women should be given this supplement providing one RNI of micronutrients daily, whether they receive fortified rations or not. Iron and folic acid supplements, when already provided, should be continued. When fortified rations *are not* being given, children aged 6 to 59 months should be given one dose each day of the micronutrient supplement shown in Table 1; when fortified rations *are* being given, children aged 6 to 59 months should be given two doses each week of the micronutrient supplement shown in Table 1. This schedule is shown in Table 2.

Furthermore, vitamin A supplements should continue to be given to young children and mothers post-partum according to existing recommendations. Breastfeeding and appropriate complementary feeding should also continue to be promoted actively.

The multiple micronutrient supplements should be given until the emergency is over and access to nutrient rich foods is restored. At this time the micronutrient status of the population should be assessed to decide whether further interventions to prevent and control micronutrient deficiencies are needed.

Two multiple micronutrient supplement formulae are currently available from UNICEF, one for pregnant and lactating women (*2*) and one for children aged from 6 to 59 months (*15*). The micronutrient composition of these formulae correspond to approximately one RNI for each nutrient and therefore are similar to those presented in Tables 1a and 1b.

Table 2. Schedule for giving the multiple micronutrient supplement shown in Table 1 which provides a daily recommended nutrient intake (1 RNI)

Target groups	Fortified food rations are NOT being used	Fortified food rations are being used
Pregnant and lactating women	1 RNI each day	1 RNI each day
Children (6–59 months)	1 RNI each day	2 RNI each week

MONITORING

The delivery of supplements should be monitored to assess coverage while existing micronutrient programmes should continue as before emergency (*6*). The health of target groups should be monitored to ensure that they are protected from deficiencies as well as from excessive consumption. Indicators for this are described in several WHO publications (*7–12*).

Moreover the continued need for supplements and fortified foods should be assessed periodically during and after the emergency. As the crisis wanes, the general distribution of supplement is likely to be reduced and then increasingly targeted to specific groups.

[1] Recommended nutrient intake is defined (RNI) as the daily dietary intake of a nutrient sufficient to meet the nutrient requirements of nearly all apparently healthy individuals in a specific population group, usually by age and sex (*9*). The definition of the RNI is equivalent to that of recommended dietary allowance (RDA) used by the Food and Nutrition Board of the United Sates Institute of Medicine (*10*)

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ACKNOWLEDGEMENTS

The following individuals contributed to the statement: Martin Bloem, André Briend, Bruno de Benoist, Nita Dalmiya, Ian Darnton Hill, Rainer Gross, Andrew Hall, Alessandro Loretti, Erin Mclean, Tina Van den Briel, Zita Weise Prinzo, Jelka Zupan.

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