

# TSUNAMI RELIEF BULLETIN

## Vitamins and minerals are crucial components of first line emergency response because they markedly reduce mortality and severity of disease

The loss of life resulting from the earthquake and ensuing tsunamis on 26 December 2004 has been the greatest tragedy of recent history. Relief efforts have been swiftly initiated to prevent further loss of life from disease outbreak and malnutrition. Providing the surviving population – especially children and women – with essential vitamins and minerals that aid in preventing and treating infectious and water-borne diseases can result in a large reduction of mortality due to disease outbreak and malnutrition. This bulletin discusses the benefits, needs and ways to distribute micronutrients among the population displaced by the tsunamis.

Communicable diseases, such as diarrhea, acute respiratory infections (ARI), measles and malaria, threaten many of the displaced populations in Aceh and North Sumatra living in densely-populated camps with insufficient facilities, poor sanitation, limited clean drinking water, and compromised nutritional status. Their nutritional status is compromised because of several factors including deprivation before reaching the camp, limited food availability within the camps, the inability to obtain additional foods, and frequent infections.<sup>1</sup>

Certain micronutrients, such as vitamin A and zinc, play a crucial role in the maintenance of the immune system.<sup>2</sup> The lack of an appropriate diet containing these much-needed micronutrients leads to reduced immuno-competence. This is when the 'vicious cycle' begins between reduced immuno-competence (due to lack of micronutrients) resulting in more infectious diseases that, in turn, cause even greater loss of nutrients. Ultimately, deaths will occur and children, due to their vulnerability, will be the first to die.

### Importance of vitamins and minerals

Recognizing the importance of vitamins and minerals for health and survival, a recent experts' meeting organized by the World Food Programme (WFP) in Boston in November 2004 and participated by various universities and international agencies, including HKI, endorsed the approach that vitamins and minerals offer an unparalleled combination of six key advantages as a first-line response in disaster situations, where poor sanitation and limited food are serious problems:

- **High impact.** Vitamin A and zinc can markedly reduce child morbidity and mortality. Vitamin A can reduce mortality from measles by ~50%, from diarrhea by ~40%, morbidity from malaria by 30%, and overall mortality by 23%.<sup>3</sup> Zinc supplementation reduces incidence and/or severity of diarrhea, pneumonia and malaria.<sup>4</sup> Therefore, WHO and UNICEF have issued a joint statement on the clinical management of acute diarrhea, which is also



supported by the Indonesian Pediatrics Association (IDAI), that includes giving children zinc supplements for 10-14 days.<sup>5</sup> Other micronutrients, such as iron and iodine are also very important for child development and reducing morbidity and mortality.

- **Low cost.** Cost of micronutrients, including transport and distribution, are low. For example, providing one vitamin A capsule costs US\$0.25, and 2-3 capsules should be provided to a child in one year. One course of zinc treatment costs only US\$0.30. Food fortification of most foods, such as salt and staples, is also very cost-effective, with only a minimal addition to the costs of foods.
- **Minimum storage needs.** Based on how they are formulated, manufactured and packaged, vitamin and mineral supplements can last for long periods in storage and do not generally require special containment.
- **Little or no preparation is required.** Vitamin/mineral supplements, whether single or multiple come in ready-to-use forms that can either be swallowed (vitamin A in oil from a capsule that is cut to allow the contents to be swallowed directly); dispersed in a teaspoon of water or other liquid (dispersible zinc tablets); sprinkled over a bowl of food (sachet of powder of multiple vitamins and minerals or ‘sprinkles’); or chewed or crushed (chewable vitamin-mineral tablets).
- **Easily transportable.** As the supplements themselves are small and light, and their packaging is compact, one person can literally carry enough for 1,000 children, and quickly access hard-to-reach areas.
- **Provide a gateway for other health and relief initiatives.** Access to and trust from vulnerable communities developed in the process of providing supplements can provide opportunities to assess needs and conditions among these groups to guide further health and relief efforts.

The Ministry of Health of Indonesia has convened a series of coordination meetings with various agencies involved in the tsunami response, and has laid out a Plan of Action that now includes the provision of vitamins and minerals to affected populations.

### HKI’s approach

1. Supplementation with Micronutrients (SUM): The HKI approach involves
  - a. an initial immediate and widespread dosing of children (6 mo – 12 yrs) with high-dose vitamin A capsules

- b. provision of dispersible zinc tablets for 10 days as adjunct to diarrhea treatment among children (2-59 mo) to reduce the severity and duration of life-threatening diarrhea
- c. distribution of multivitamin/mineral formulations for children aged 6 mo – 12 yrs (1 daily dose of 14 vitamins and minerals in the form of sprinkles or chewable tablets) to be taken daily for 100 days to complement the food aid, enhance health and prevent vitamin/mineral deficiencies
- d. distribution of iron fortified soy sauce, 1 sachet per 4-5 people per day for 3-5 months, to reduce anemia, particularly among adults, and make the diet that is largely based on food aid (rice, noodles, biscuits) more palatable.

*See box “What vitamins and minerals . . .” (p3) for more details on each of these components. The distribution of these various formulations is done in collaboration with various agencies that are on the ground in Aceh and North Sumatra, including the Provincial and District Health Offices, the Ministry of Health, UNICEF, the Indonesian Medical Association (IDI), CWS, CARE, PLAN, Terre des Hommes, SurfAid and other agencies that express interest. HKI assures supplies, provides training of staff and supervises where necessary. These activities are supported by a variety of donors (see ‘Supplies already obtained’ below).*

2. Rapid Emergency Assessment and Prioritization (REAP): Given the multiple groups involved in

### Supplies already obtained

To enact this strategy and supplement the supply of vitamin A capsules provided by the Ministry of Health, HKI assured a supply of various vitamin-mineral preparations. This covers part of the need and has been supported by the following organizations and companies:

Terre des Hommes, CARE, PLAN:

Vitamin A capsules, zinc tablets, sprinkles, iron-fortified soy sauce and iodine capsules

Nutriset: Zinc tablets donation

Kimia Farma: Vitamin A capsules donation

Akzo Nobel: Donation of iron fortificant needed for soy sauce

HJ Heinz Company & PT Heinz ABC Indonesia:

Will produce iron fortified soy sauce and sprinkles at reduced cost

In addition, financial and in-kind support to enable transport, training and distribution of the vitamin/mineral formulations as well as the rapid assessment is coming in and being negotiated with various donors.

the relief response, the coordination of this effort based on needs assessment is critical to optimize overall resources. REAP will assist in determining the population conditions and coverage of basic assistance, and recovery in Aceh and North Sumatra. In the first weeks, this focuses on assessing the basic living conditions of affected areas and helping to guide deployment of services

such as clean water, shelter, food, sanitation, and medical care. Simple disease incidence and prevalence (diarrhea, pneumonia, malaria) and nutritional status will be determined through on-site assessment. This information will be provided to all groups involved in the relief and rebuilding effort to assist in prioritization and coordination.

## What vitamins and minerals are recommended for the current situation in Aceh and North Sumatra, why, for whom, what dosage, when or at what frequency?

### *Vitamin A capsules:*

- **Why?** It reduces severity of disease and can reduce mortality from measles by ~50%, from diarrhea by ~40%, and overall mortality by 23%.<sup>3</sup>
- **Whom?** For prevention to children aged 6 mo – 12 yrs (normally upto 59 mo) and to women within 6 weeks of delivery. Also as an adjunct for treatment of measles, xerophthalmia (including night blindness) and severe malnutrition.
- **Dosage?** For prevention, 100,000 IU for 6-11 mo old children, 200,000 IU for 1-12 y old children and 2 x 200,000 IU for postpartum women. For treatments, specific guidelines exist, depending on the condition.
- **When?** For prevention, every 4-6 months. For treatment, specific guidelines exist depending on the condition.

### *Zinc, dispersible tablets:*

- **Why?** Short course 10-day dosing reduces the severity of diarrhea and is recommended by WHO/ UNICEF, and supported by the Indonesian Pediatric Association (IDAI), as an adjunct to diarrhea treatment.<sup>5</sup>
- **Whom?** Children aged 2-59 mo with diarrhea.
- **Dosage?** 10 mg for 2-5 mo old infants and 20 mg for 6-59 mo old children, daily for 10 days.
- **When?** When a child presents with diarrhea, zinc should be given. For prevention, zinc should be part of a multivitamin/mineral supplement (see below).

### *Multivitamin/minerals, sprinkles and foodlets:*

- **Why?** Because the diet of displaced people is generally not well balanced and lacks an adequate content of vitamins and minerals,<sup>1</sup> and the needs for these in such situations are higher. This is comparable to the situation found during Indonesia's economic crisis when dietary quality was reduced and micronutrient deficiencies, such as anemia due to lack of iron, increased markedly.<sup>6</sup>
- **Whom?** In principle, all individuals need extra

vitamins and minerals. In the present situation, priority is given to children aged 6 mo – 12 yrs.

- **Composition and dosage?** 1 RDA (recommended daily allowance, normally to be ingested from the daily diet) of multivitamins/minerals, including iron, vitamin A, zinc, iodine, B vitamins, vitamins C, D and E, and folic acid. These supplements exist in a few kinds. We propose to use sprinkles (encapsulated multivitamin-mineral formulation in powder form) that can be consumed mixed in with food, an approach also supported by IDAI. Foodlets (chewable tablets) are another multivitamin-mineral formulation, which can be consumed without food.
- **When?** These preparations should be consumed daily and be provided for three months.

### *Iron-fortified soy sauce:*

- **Why?** Iron deficiency is the main cause of anemia. The prevalence of anemia under normal circumstances among non-pregnant women in Indonesia is already 20-30%.<sup>7</sup> Consequences of anemia include lethargy, reduced productivity and among children also reduced mental and psychomotor development.
- **Whom?** Children will receive iron as part of the multivitamin/mineral supplements, but adolescents and adult women also need extra iron, especially under these circumstances.
- **Composition and dosage?** Very good results were recently obtained with iron fortification of soy sauce (using NaFeEDTA) in the district of Bandung in Indonesia, where a 30-50% reduction of anemia was observed among women who consumed soy sauce at least every other day (unpublished observations, HKI). In the present situation, a condiment such as soy sauce will also considerably improve the taste of the food.
- **When?** Sachets of fortified soy sauce should be consumed daily (1 sachet per 4-5 people) for at least 3-5 months.

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