

Nutrition

Micronutrients - Iodine, Iron and Vitamin A

Introduction

Micronutrients enhance the nutritional value of food and have a profound impact on a child's development and a mother's health. UNICEF works with governments and a diverse group of public and private organizations to deliver essential micronutrients including iodine, iron, vitamin A and folate.

The severity of the tsunami emergency highlighted the urgent need to provide multiple micronutrients to children aged 6-59 months and to pregnant and lactating mothers during emergencies. A global consultation in Panama in November 2005 endorsed the recommendation to use multiple vitamins and minerals primarily in emergency settings and thereafter in non-emergency settings and to develop a framework with partners for implementation at country, regional and global levels. Based on the recommendations, WHO, WFP and UNICEF issued a [Joint Statement on Preventing and controlling micronutrient deficiencies in populations affected by an emergency](#) in March 2006. Guidelines in support of the implementation of the joint statement are being developed. UNICEF Supply Division is currently updating existing product specifications and identifying potential products to support country requirements during emergencies.

Delivering essential micronutrients: Iodine

GOAL: Achieve the sustainable elimination of iodine deficiency disorders by 2005

"The success of the drive for universal iodization of salt shows that the diets of children, women and families world-wide can be changed in small but very beneficial ways in just a few years as a result of concerted global, national and local action." – UNICEF Executive Director Carol Bellamy.

The Challenge

Iodine deficiency is the primary cause of preventable mental retardation and brain damage, having the most devastating impact on the brain of the developing foetus and young children in the first few years of life. Iodine deficiency also increases the chance of infant mortality, miscarriage and stillbirth.

Most children born to iodine-deficient mothers appear normal but have also suffered brain damage and loss in IQ points, affecting their ability to develop to their full potential. These seemingly normal children will later have difficulty learning in school and staying in school. Some children born to iodine-deficient mothers can suffer from extreme physical and mental retardation manifesting in goiter (an enlarged thyroid gland), speech defects, deafness and cretinism. These children, however, represent only the tip of the iceberg; in addition, in many cases it is too late to reverse these effects.

Efforts are therefore concentrated on 'sub-clinical' IDD, or those children who have suffered from less severe deficiencies and who appear normal, but have lost 10 to 15

intelligence quotient (IQ) points. All IDD can be prevented with just one teaspoon of iodine - consumed in tiny amounts on a regular basis over a lifetime - at very little cost (US five cents per person annually).

The 1990 World Summit for Children set the goal of eliminating iodine deficiencies by 2000. Tremendous progress has been made through salt fortification - the proportion of households in the developing world consuming adequately-iodized salt has risen from less than 20 per cent in 1990 to over 70 per cent today. Each year nearly 91 million children a year are now protected against learning impairment related to iodine deficiency and losses in learning capability.

However, the battle to prevent iodine deficiency is not yet over. The 30 per cent of households in the developing world not consuming iodized salt include 41 million infants and newborns who are not protected. Steps must be taken to ensure that women consume iodized salt during pregnancy so that their children are protected. Steps must also be taken to sustain the progress that has been made to date. The formation of 'national watches' that include the public and private sectors and consumer groups is an important way for vigilance to be maintained in countries.

The Solution

UNICEF and a diverse group of public and private sector organizations are working to eliminate iodine deficiency through Universal Salt Iodization (USI). Partners include salt producers, governments, the International Council for the Control of Iodine Deficiency Disorders (ICCIDD), the World Health Organization (WHO), the Micronutrient Initiative, the World Bank, Kiwanis International, schoolteachers, consumer organizations and children in classrooms around the world.

China has been one of the most phenomenal success stories of the 1990s, with iodization rates rising from 39 per cent to 95 per cent in a span of 10 years. Others include Jordan, which has increased coverage from five per cent to nearly 90 per cent and Bangladesh where iodization has increased from 20 to 70 per cent. Latin American countries such as Peru have a long history of commitment to salt iodization and notable African successes include Nigeria and Kenya.

One reason for the dramatic success of salt iodization during the 1990s was extensive advocacy at the national level. To meet the goal of eliminating iodine deficiency by 2005, UNICEF is re-advocating with governments to commit them to eliminating iodine deficiency and to encourage the involvement of salt producers as a way to sustain the process. UNICEF is also working actively with civil society and schools to create and increase the demand for iodized salt.

Country snapshots:

IDD is a major health problem in Lao PDR. It is one of the most severely-affected countries in the world due to its mountainous terrain and monsoon climate, which prevent micronutrients being retained in the soil. With the support of UNICEF, the Government of Laos and salt producers are committed to improving iodine nutrition and run 'The Elimination of Iodine Deficiency Disorders' project. This partnership has resulted in more than 90 per cent of households in Laos now consuming iodized salt.

Considerable success has been achieved towards universal salt iodization in Nepal. All salt imported from neighbouring India is iodized and then distributed on the market. The quality of iodized salt in some areas and the population's traditional preference for large crystal salt represents constraints to progress because handling, trading and storage practices of this

salt cause considerable loss of iodine.

A third of the households in Nepal are still using salt with low iodine content, so UNICEF is working to improve public awareness of iodine deficiency and the need to consume iodized salt, monitoring the supply of iodized salt and is working with salt producers to improve salt quality and packaging.

In Viet Nam, UNICEF focuses its IDD reduction efforts in the Mekong Delta region due to the high prevalence of IDD and limited iodized salt coverage in the area. UNICEF has provided its counterparts with salt refinery systems to improve the quality of iodized salt, and has supported government initiatives to make iodized salt readily available throughout the region.

Delivering essential micronutrients: Iron

GOAL: Reduce the prevalence of anaemia (including iron deficiency) by one third by 2010

"Our challenge now is to get more countries to tackle the problem of iron deficiency, to work with them on taking actions that can improve the health and quality of life of their populations, and the economic productivity of their countries." UNICEF Executive Director Carol Bellamy

The Challenge

Iron deficiency is the most pervasive nutritional problem in the world. Between 4 and 5 billion people suffer from iron deficiency and an estimated 2 billion are anaemic. Women and young children are most vulnerable: 50 per cent of pregnant women and 40 to 50 per cent of children under five in developing countries are iron deficient. Progress in eliminating iron deficiencies has lagged far behind that of vitamin A and iodine – in fact there was no significant change in the number of anaemic mothers during the 1990s. Anaemia increases the risk of haemorrhage and sepsis (overwhelming bacterial infection) during childbirth and is implicated in 20 per cent of maternal deaths. These women may give birth to premature babies or low-birth-weight infants who suffer from infections, weakened immunity, learning disabilities, impaired physical development and, in severe cases, death. Infants will be anemic if they do not receive important iron stores from the mother during pregnancy and during delivery.

The Solution

Iron deficiency and anaemia take a huge toll on the lives and productivity of both adults and children alike. However, they can be addressed on numerous fronts. Iron-folate supplements during pregnancy help prevent anaemia in the mother, while folate prevents severe neural tube defects, such as spina bifida and anencephaly, in the foetus. UNICEF uses educational campaigns to clarify the important role of iron in the diet. When iron-rich foods – liver, red meats, eggs, fish, whole-grain bread, legumes – are not widely available or affordable, fortifying staples such as flour is an alternative for reaching a large portion of the population. Finally, in malaria-endemic countries, anti-malarial interventions, such as bednets, are critical for preventing anaemia because malaria is often the major underlying factor.

Country snapshots:

In some areas of Yemen, up to 80 per cent of the population suffers from iron-deficiency anaemia. It also has poor medical care and significant problems with malaria and intestinal parasites, both of which can exacerbate anaemia. Thus eliminating anaemia must be approached from several directions: food fortification, supplementation, parasite eradication, malaria control and improving obstetric and reproductive health care.

Delivering essential micronutrients: Vitamin A

GOAL: Achieve the sustainable elimination of vitamin A deficiency by 2010

The Challenge

Vitamin A is an essential micronutrient for the immune system. At least 100 million children under five suffer from vitamin A deficiency (VAD), high levels of which can cause blindness and greatly increase the risk that a child may die from diseases such as measles, diarrhoea and acute respiratory infections.

Rapid progress has been made in eliminating VAD. The key now is to ensure that this progress is sustainable and to reach the remaining children. For example, many vitamin A supplementation programmes are combined with the polio immunization campaigns. However, these are being phased out as the world nears its goal of eradicating polio, so another delivery mechanism must be found.

A further challenge is to educate governments, health professionals, policymakers and the public about the benefits of supplementation and diffuse any fears among the public that it is dangerous for children. In the past, VAD has been seen merely as a cause of blindness, and in many countries, vitamin A activities are still limited to blindness prevention programmes. In other countries, no action has been taken to reduce VAD or the extent of the problem may not have even been assessed.

The Solution

UNICEF has three strategies for eliminating VAD: vitamin A supplements, fortifying staples and diversifying foods. Breastfeeding is included in the category of diversifying foods, because this is where infants receive much of their vitamin A.

As a partner in the Vitamin A Global Initiative, UNICEF is supporting supplementation during health interventions such as National Immunization Days (NID), fortification of food staples, such as sugar, and nationwide supplements for children and post-partum or breastfeeding women. The Vitamin A Global Initiative partners include UNICEF, the World Health Organization (WHO), the Canadian International Development Agency (CIDA), the United Kingdom's Department for International Development (DfID), the United States Agency for International Development (USAID) and the Micronutrient Initiative (MI).

UNICEF's role is to support the logistical planning, provide supplements and then assist in monitoring and evaluating the entire system. UNICEF supports 95 per cent of the world's vitamin A supplements for developing countries, with the bulk of the funding coming from the Micronutrient Initiative. This simple supplement, costing only two cents per capsule, can improve a child's chance of survival by up to 25 per cent. Providing vitamin A to pregnant women can also reduce maternal deaths. Today the majority of children in more than 40 countries are receiving at least one vitamin A supplement yearly. UNICEF estimates that as many as 300,000 child deaths are prevented each year due to vitamin A supplementation. In countries where mortality among young children is high, ensuring that children between six months and 59 months receive enough vitamin A may be the single most cost-effective child survival intervention. Another cost-effective option is fortifying staple foods that most of the population eats and that is produced in a way that will accommodate fortification, such as oils or flour. Many countries in Central America, such as Guatemala and Honduras, have had great success with sugar fortification.

Finally, wherever possible, including items such as meat, eggs, fruit, red palm-oil, green leafy vegetables and carrots in the diet will ensure adequate vitamin A consumption.