Children grow and develop well when they have access to affordable, diverse, nutrient-rich food, appropriate maternal and child care, adequate health services and a healthy environment including safe water, sanitation and good hygiene.

Children can become undernourished – therefore failing to grow and thrive – for a variety of reasons. The immediate causes of undernutrition are:

- **inadequate dietary intake**, whether as a result of poor maternal diet before, during and after pregnancy, sub-optimal breastfeeding, inadequate complementary foods during weaning or insufficient nutrient-rich foods during early childhood

- **disease**, including parasitic infections, diarrhoeal disease, or other infections such as measles.

Underlying these causes are factors such as household food insecurity (due to poverty or other reasons), inadequate care and feeding practices, unhealthy household environments and inadequate health services. How these factors inter-relate with each other is shown on page 64.

Being undernourished for a long time can lead to stunting. In addition to its most obvious effects on stature (height), stunting has implications for the health and development of children, including their ability to learn. It can also lead to an increased risk of chronic diseases, such as heart disease or diabetes, in adulthood.

Although stunting is declining, the rate of decline is too slow. There are now major global initiatives in place to improve the nutritional status of young children – the group most vulnerable to undernutrition and in whom the effects of undernutrition are greatest.

Two of the main initiatives are the Scaling Up Nutrition (SUN) movement and the 1,000 Days Partnership, which focuses on the period of that encompasses pregnancy and the first two years of the child’s life. These initiatives have similar aims. Broadly, these are:

Continues overleaf
In this issue

61 Do vitamin A deficiency and undernutrition still matter?
64 Understanding undernutrition
65 What is vitamin A and why do we need it?
66 The eye signs of vitamin A deficiency
68 How to manage children with the eye signs of vitamin A deficiency
69 Public health programmes for vitamin A deficiency control
72 Vitamin A supplementation: who, when and how
72 Vitamin A deficiency: what eye health workers can do
75 EXCHANGE Keep on operating: how to deal with power cuts
76 PRACTICAL ADVICE How to measure and record blood pressure (p 76)
76 Verifying the calibration of a manual one-position keratometer (p 77)
78 TRACHOMA UPDATE
79 CPD QUIZ
60 NEWS AND NOTICES

EDITORIAL Continued

• to improve women’s nutrition before, during and after pregnancy to promote intrauterine growth and improve the quality of breast milk
• to promote and support exclusive breastfeeding for the first 6 months of a child’s life followed by continued breastfeeding together with the introduction of safe and appropriate complementary feeding for the next 18 months and beyond
• to ensure children get the vitamins and minerals they need, whether through better dietary choices, food fortification or micronutrient supplementation
• to treat malnutrition with appropriate nutritional interventions.

Improving the availability of affordable, nutritious foods requires a broad approach, encompassing all the farmers,

<table>
<thead>
<tr>
<th>Severity</th>
<th>None (&lt;2%)</th>
<th>Mild (2%-&lt;10%)</th>
<th>Moderate (10%~&lt;20%)</th>
<th>Severe (&gt;20%)</th>
<th>No data</th>
</tr>
</thead>
</table>

Figure 1. Global extent of vitamin A deficiency as defined by prevalence of serum reinol <0.70 µmol/l in preschool children²

© International Centre for Eye Health, London. Articles may be photocopied, reproduced or translated provided these are not used for commercial or personal profit. Acknowledgements should be made to the author(s) and to Community Eye Health Journal. Woodcut-style graphics by Victoria Francis and Teresa Doughton, ISSN 0953-6833

Disclaimer
Signed articles are the responsibility of the named authors alone and do not necessarily reflect the views of the London School of Hygiene & Tropical Medicine (the School). Although every effort is made to ensure accuracy, the School does not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use.

The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by the School in preference to others of a similar nature that are not mentioned. The School does not endorse or recommend products or services for which you may view advertisements in this Journal.
businesses, institutions and processes (such as supply chains) which produce, process and make foods available to communities.

**Vitamin A deficiency remains a problem**

Most children who suffer from malnutrition and stunting are deficient in many micronutrients, such as the B vitamins, vitamin D, iron, iodine and zinc. Stunted children are also usually deficient in vitamin A, which places them at increased risk of blindness and death.

- **Blindness.** Vitamin A deficiency can result in xerophthalmia (‘dry eyes’), which in its most severe forms results in irreversible blindness (pages 66–67). Xerophthalmia, in the form of night blindness, and low levels of retinol (the form of vitamin A found in the blood), are both indicators of vitamin A deficiency.
- **Death.** In children, the link between vitamin A deficiency and death is so strong that mortality rates in children under 5 years are now taken to be a ‘surrogate’ indicator of vitamin A deficiency. Vitamin A deficiency is considered to be a public health issue in countries with mortality rates in children under 5 years of ≧50 deaths per 1,000 live births. In sub-Saharan Africa, 40 countries have mortality rates in under-5s above this level; of these, 37 have mortality rates that are twice as high (over 100 deaths per 1,000).2

Although great strides have been made to address vitamin A deficiency in children, it is clear from these data that there are still many countries where vitamin A deficiency remains a problem. Worldwide, in populations at risk of vitamin A deficiency, one in three preschool-aged children is thought to be deficient in vitamin A with the greatest burden in Africa and Southeast Asia (Figure 1).3

In the short term, vitamin A supplementation is the most effective way to reduce vitamin A deficiency and child mortality (see page 70). Doing something about vitamin A deficiency on its own, however, will not deal with the larger problem of undernutrition and deficiency of other micronutrients essential for growth, health and educational development. This is why, in this issue of the Community Eye Health Journal, we suggest that vitamin A deficiency must be addressed – not just with supplementation – but also by working with mothers to address the immediate and underlying causes of chronic undernutrition. This will improve their children’s health and diet and therefore also their general nutrition. In particular, we should encourage improved hand washing practices and work with families to overcome customs associated with inadequate complementary or weaning foods.

Vitamin A supplementation – a specific, targeted intervention delivered by health workers – remains an important and effective strategy for reducing vitamin A deficiency. Many countries are achieving high coverage, but even in these countries, many infants and children living in poor, rural communities are not being reached. This issue discusses some of the ways in which coverage can be improved and highlights the successes achieved in Burkina Faso.

As eye care professionals, we can do a lot to inform and educate communities about nutrition in general and how families can improve the diet of young children, thereby also preventing them from becoming vitamin A deficient. This issue gives some practical examples of what you can do either in the clinic or during outreach and includes advice on how to manage a child with xerophthalmia and what urgent action is needed to reduce the risk of blindness and death.

Chronic undernutrition affects communities, not just individuals. It is therefore important to remember that when we see a child with xerophthalmia, there are likely to be many more children affected by the condition in his or her community. Many of these children, although vitamin A deficient, will not show the eye signs.

**References**


Further reading

1,000 Days Partnership. www.thousanddays.org

© The author/s and Community Eye Health Journal 2013. This is an Open Access article distributed under the Creative Commons Attribution Non-Commercial License.