

The time to address undernutrition in infants and young children is now

Undernutrition affects a large proportion of children in developing countries. Black et al¹ estimated that, in 2005, 32% of all children under five years of age in developing countries were stunted and that 20% were underweight. Many factors are responsible for these figures, including maternal undernutrition, intrauterine growth restriction, lack of or inadequate breastfeeding, poor complementary infant-feeding practices beyond six months of age, and the interaction between undernutrition and recurrent infections. These authors estimated that maternal and child undernutrition was the underlying cause of 3.5 million deaths annually and 35% of the disease burden in children under the age of five years. While many countries have shown impressive reductions in under-five mortality since 2005, thus probably reducing these figures to some extent,² undernutrition remains a major factor that is responsible for child mortality and morbidity.

Apart from the abovementioned factors which are responsible for childhood undernutrition, certain situational factors may make children particularly susceptible. These include natural disasters, famine and conflict situations. In this issue of the *SAJCN*, Mokori and Orikushaba reports on the results of a survey that was carried out in northern Uganda.³ Political instability and conflict lasted for 25 years in this region, with most children being born in camps for internally displaced persons. The conflict came to an end in 2008, allowing these displaced people to return to their original villages. A survey was conducted in mid-2010 to assess the nutritional status, feeding patterns and sanitation in these areas. There was concern that, with relief agencies having been withdrawn from the region once the displaced people were able to return to their villages, food supplies and health services would be severely compromised. Although the study included children up to five years of age, this paper reported only on the results of children aged six to 23 months.

The prevalence of underweight in this study was 18%, while that of wasting was 11%. Although higher than the prevalence found in a national survey that was carried out in Uganda in 2006 where the rates were 16% and 6% respectively, the national survey included children up to five years of age. It is well recognised that the highest rates of underweight and wasting are found in infants who are younger than two years of age. The prevalence of underweight was lower than the 20% reported by Black et al for all developing countries, and the 2.3% rate of severe wasting in this study was also lower than the 3.5% found by Black et al.¹ Thus, although the rates of underweight and wasting are high in this study and are cause for concern, considering that it has been only two years since the population was able to return to their villages, they are not as high as might have been expected.

Some of the factors that are responsible for these perhaps better-than-expected rates of undernutrition are reported in this paper. The authors report that 47% of the studied children were breastfed exclusively for six months and that 61% of the children who were 18-23 months of age were still being breastfed. However, the frequency and diversity of foods other than milk consumed by the children in this study were cause for concern. There was an average of only 2.2 meals per day and an average intake of only three food groups per day. Immunisation rates were relatively high considering the recent conflict situation. Eighty-eight per cent of children had received diphtheria, pertussis and tetanus 3 (DTP 3) vaccines and 78% the measles vaccine, while 88% had been given vitamin A supplementation. This indicates that preventive health services for children were already functioning reasonably effectively.

Focus groups were also conducted as part of this study and the community's ability to recognise malnutrition was one aspect that was studied. The participants' descriptions of undernourished children related mainly to signs that would be evident in children with severe wasting. In the abovementioned study, only 2.3% of the children were severely wasted. In their discussion, Mokori and Orikushaba state that these communities "generally understood the presentation and effects of undernutrition in children".³ However, the vast majority of undernourished children were not wasted, but stunted and underweight, often in roughly equal proportions, with the result that the appearance of the child would not lead the average lay person to consider the child to be malnourished. It is only when length, height and weight are plotted on appropriate growth charts according to the age of the child that the nutritional disorder is appreciated. Since the major contribution of undernutrition to under-five mortality derives from children who are stunted and/or underweight and not from children who are severely wasted,^{1,4} it is vital that growth monitoring is practised routinely in order to detect these children.

The authors of this paper did not report the prevalence of overweight and it would be expected that it would be very low in this setting. However, many developing countries are experiencing a major increase in obesity in adults and adolescent girls. Some concern has been expressed that catch-up growth in early life may have adverse effects on the predisposition to the later development of obesity and diabetes. In this regard, an analysis of large birth cohort studies in low- and middle-income countries showed that catch-up in weight up to 48 months of age was not shown to be a risk factor for adult glucose intolerance. This suggests that this time frame may provide a window of opportunity for improved nutrition, which may then result in better childhood survival and improved adult human capital, without increasing the risk for adult diabetes.⁵ On the other hand, the

same study showed a strong association between catch-up growth after 48 months of age and adult diabetes. Thus, it is important that undernutrition is detected in the early years of life and for effective interventions to be instituted timeously.

While the conclusions that were drawn by Mokori and Orikushaba are applicable to the setting of this study,³ they can also be generalised to all settings where undernutrition is prevalent in infancy and early childhood. The authors stress the importance of a holistic approach to these challenges, utilising interventions that address the entire household, including men and grandmothers. They recommend that such interventions should include nutrition education, as well as improvements in sanitation and water supply. The latter aspects were particularly poor in their study setting. These conclusions resonate well with the recommendations of the Maternal and Child Undernutrition Study Group.⁶ In this comprehensive review, it was stressed that those interventions that have been shown to be effective should be incorporated into a multifaceted approach. These interventions included micronutrient supplementation, including iron and folate for pregnant women to reduce the risk of low birthweight at term, breastfeeding promotion, education about complementary feeding after six months, and in populations with insufficient food, food supplements or conditional cash transfers, supplementation of vitamin A, iron and zinc for children and the prevention of infectious diseases that contribute to undernutrition by

improving sanitation and water supply. Sufficient evidence relates to effective interventions so that substantial inroads can be made into the prevalence of undernutrition in young children in all regions where these rates are high. What is now required is implementation.

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References

1. Black RE, Allen LH, Bhutta ZA, et al. Maternal and child undernutrition 1. Global and regional exposures and health consequences. *Lancet*. 2008;371(9608):243-260.
2. UNICEF. Committing to child survival: a promise renewed: progress report 2012. United Nations Children's Fund; 2012.
3. Mokori A, Orikushaba P. Nutritional status, complementary feeding practices and feasible strategies to promote nutrition in returnee children aged 6-23 months in northern Uganda. *S Afr J Clin Nutr*. 2012;25(4):173-179.
4. Pelletier DL, Frongillo EA, Schroeder DG, et al. The effects of malnutrition on child mortality in developing countries. *Bull World Health Organ*. 1995;73(4):443-448.
5. Norris SA, Osmond C, Gigante D, et al. Size at birth, weight gain in infancy and childhood, and adult diabetes risk in five low- and middle-income country birth cohorts. *Diabetes Care*. 2012;35(1):72-79.
6. Bhutta ZA, Ahmed T, Black RE, et al. Maternal and child undernutrition 3. What works? Interventions for maternal and child undernutrition and survival. *Lancet*. 2008;371(9610):417-440.