

Technical Brief

Quantifying the risk of zinc deficiency: Recommended indicators

Efforts to estimate the global prevalence of zinc deficiency require the application of accurate, easily measurable indicators of zinc status or the risk of zinc deficiency in a given population. WHO, UNICEF, IAEA, and IZiNCG jointly recommend the following methods for assessing the zinc status of the population or the risk of inadequate zinc intake [1]:

deficiency in populations.

The risk of zinc deficiency is considered to be elevated and of public health concern when the prevalence of inadequate intakes is >25%.

For more information, see IZiNCG technical brief no. 3, 2007.

- **Blood plasma or serum zinc concentration**

The concentration of zinc in blood plasma or serum is the best available biomarker of risk of zinc deficiency in populations.

The risk of zinc deficiency is considered to be elevated and of public health concern when the prevalence of low serum zinc concentrations is >20%.

For more information, see IZiNCG technical brief no. 2, 2007.

- **Dietary zinc intake**

Chronic inadequate dietary intake of zinc is the most likely cause of zinc deficiency. Hence, estimating the adequacy of zinc intakes through quantitative dietary intake surveys is useful to evaluate the risk of zinc

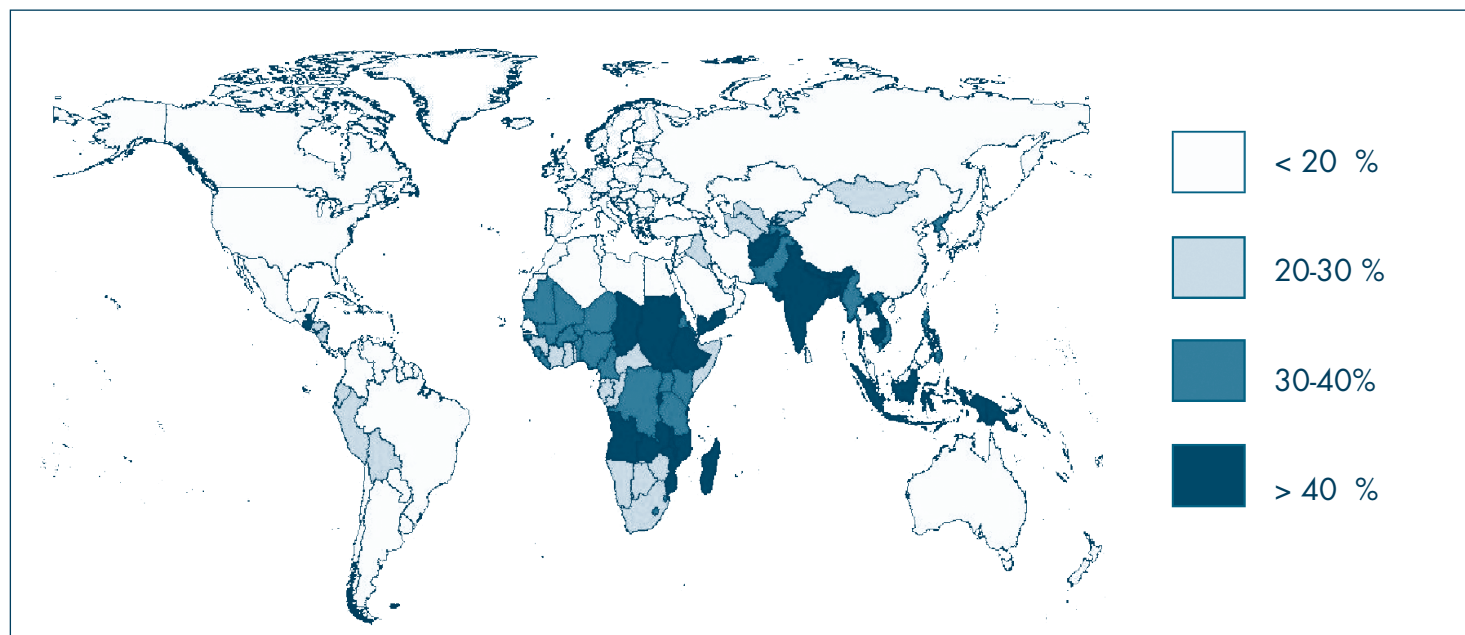
- **Stunting prevalence**

Height-for-age—a measure of nutritional stunting—is the best known and easiest to measure of the adverse outcomes associated with zinc deficiency in populations. Stunting prevalence is expressed as the percent of children under 5 years of age with height-for-age below the expected range of a reference population (i.e., less than -2.0 standard deviations with respect to the reference median).

Detailed information on measuring and interpreting serum zinc concentration and dietary assessment methods are provided in other IZiNCG technical briefs. The following sections will focus on stunting prevalence.

As a preliminary step in estimating the global prevalence of zinc deficiency, the risk of zinc deficiency can be estimated for each country based on existing values for the national

Prevalence of nutritional stunting in children under 5 years of age



prevalence of stunting in pre-school children. Data on stunting rates were derived from the most recent DHS and WHO surveys [2-4] and Unicef population data [5]. The results indicate that approximately 30% of the children under 5 years of age are stunted worldwide.

WHO considers a prevalence of stunting greater than 20% of the population to indicate a public health concern [6]. As zinc deficiency is not the only factor affecting children's growth, assessment of dietary zinc intake and serum zinc levels

can be used to confirm the risk of zinc deficiency in these high-risk countries [1]. These assessments should be incorporated into existing public health and child nutrition monitoring programs where possible. Increased zinc intake has beneficial effects on growth and morbidity in populations with low zinc status [7-8]; thus, programmatic action is warranted in areas where high rates of zinc deficiency are confirmed.

This technical brief was prepared by Reina Engle-Stone and Dr. Sonja Y. Hess and was reviewed by members of the IZiNCG Steering Committee.

References

1. Executive summary. Recommendations for indicators of population zinc status. Report of WHO / UNICEF / IAEA / IZiNCG Interagency Meeting on Zinc Status Indicators. Food Nutr Bull, 2007;28:S399-S400.
2. WHO Statistical Information System (WHOSIS). Includes data from 'World Health Statistics 2006' and 'The World Health Report 2006 Edition'. World Health Organization 2006. <http://www.who.int/en/>. Accessed 11/2/06.
3. WHO Global Database on Child Growth and Malnutrition. http://www.who.int/gdgm/p-child_pdf/. Accessed 11/6/06.
4. Demographic and Health Surveys. <http://www.measuredhs.com/accesssurveys/search/start.cfm>. Accessed 11/6/06.
5. Unicef. Information by country. www.unicef.org/infobycountry. Accessed 2/26/07.
6. IZiNCG. Assessment of the risk of zinc deficiency in populations and options for its control. Food Nutr Bull, 2004;25:S94-S203.
7. Brown KH, Peerson JM, Rivera J, Allen LH. Effect of supplemental zinc on the growth and serum zinc concentrations of prepubertal children: a meta-analysis of randomized controlled trials. Am J Clin Nutr 2002;75:1062-71.
8. The Zinc Investigators' Collaborative Group, Bhutta ZA, Black RE, et al. Prevention of diarrhea and pneumonia by zinc supplementation in children in developing countries: pooled analysis of randomized controlled trials. J Pediatr 1999;135:689-97.

About IZiNCG

IZiNCG is the International Zinc Nutrition Consultative Group whose primary objectives are to promote and assist efforts to reduce global zinc deficiency through interpretation of nutrition science, dissemination of information, and provision of technical assistance to national governments and international agencies. IZiNCG focuses on identification, prevention and treatment of zinc deficiency in the most vulnerable populations of low-income countries. The Steering Committee of IZiNCG consists of 11 well-recognized international scientists with longstanding expertise in zinc nutrition and public health programs.

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