



Technical Note 12

Vitamin and Mineral Status Worldwide: What We Know and the Challenges Ahead

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During the last 20 years, micronutrient surveillance and intervention efforts have focused mostly on vitamin A, iodine, and anemia (as a proxy of iron status). Although work is ongoing to better understand the distribution of other micronutrient deficiencies, our current global understanding is still limited to these three indicators.

Global micronutrient status has improved modestly over the last two decades, but around two billion people suffer from at least one vitamin or mineral deficiency. Anemia prevalence in 2011 was 29 percent, 38 percent, and 43 percent in nonpregnant women, pregnant women, and children 6–59 months of age, respectively (Stevens et al 2013). In 2011, 32 countries had inadequate iodine intake, based on data from school-age children (Zimmerman and Andersson 2012). In 2012, vitamin A deficiency affected almost 30 percent of children under age 5 in low- and middle-income countries (Stevens et al 2014), and data are insufficient to estimate current vitamin A deficiency in pregnant women, which in 2005 was 15.3 percent (WHO 2009). Deficiencies remain high in the poorest regions of the world, particularly in South Asia and Africa south of the Sahara, and the extent to which multiple deficiencies overlap in these settings is still not well documented.

Logistic and economic challenges constrain the collection of micronutrient biomarkers in nationally representative surveys, as they typically involve biological sample collection, time-sensitive specimen processing, and cold chain management. Current availability of micronutrient biomarker data is sparse in general, with few countries having conducted more than one national survey in the same population of interest, making it difficult to assess progress. Hemoglobin, for instance, was the most assessed micronutrient biomarker between 1995 and 2011, and only 71 countries had two or more survey data for it. The scenario for vitamin A and iodine is less promising, as fewer data are available, which frequently are restricted to only one of several vulnerable population groups in a country.

National survey data on biomarkers of other micronutrients relevant for public health such as folate, zinc, vitamin D, vitamin B12, or iron are almost nil. Their measurement is constrained by complex specimen collection and processing requirements as well as by the lack of appropriate international recognized cut-offs (or adjustments) indicative of different levels of status and of international reagents and standards that facilitate the comparability between assay kits.

In terms of coverage of micronutrient interventions, the World Health Organization (WHO) identifies more than 10 essential micronutrient actions for vulnerable populations. Vitamin A supplementation in children 6–59 months and salt iodization¹ are the most widely collected indicators of coverage. Some data are available on the use of iron and folic acid tablets in pregnancy or household availability of fortified flour; however, the lack of internationally agreed definitions is a key limiting factor for their comparability and global assessment.

¹ Biannual vitamin A supplementation coverage ranges between 70 and 75 percent since 2005.

In 2011, 70 percent of the households had access to any iodized salt and only 29 percent out of 128 countries met the international criterion of 90 percent of households with adequately iodized salt.

The main challenges in global micronutrient surveillance for the upcoming years are as follows:

- allocate resources for countries with no data but an interest in conducting surveys
- escalate the number of nationally representative survey data on multiple micronutrient biomarkers, collected through standardized methods
- develop or revise as needed micronutrient biomarker cut-offs in different age groups so that they better reflect the vitamin and mineral nutrition spectrum, from deficiency to excess
- develop the necessary international reagents for micronutrient assessment and promote their adoption by assay kit manufacturers
- increase the number of national and regional laboratories that are affiliated with an external quality assurance program
- develop field-friendly devices that allow a quick and low-cost assessment of multiple biomarkers in a small blood samples
- integrate micronutrient biomarkers into national health information systems
- standardize coverage definitions, collect coverage data, and collate it in a global database to track progress of micronutrient interventions

Micronutrient interventions are among the most cost-effective nutrition interventions, and momentum is building internationally to address vitamin and mineral deficiencies in an effective and safe manner. The above challenges, rather than providing a paralyzing scenario, call the public health community to harmonize surveillance efforts, wisely allocate financial and human resources, and establish a global road map for micronutrient interventions to achieve global nutrition targets for 2025, reduce micronutrient-attributable maternal and neonatal mortality, and improve healthy early childhood development. We all are accountable for this.

References

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