

References

1. South African Vitamin A Consultative Group (SAVACG). Anthropometric, vitamin A, iron and immunisation coverage status in children aged 6-71 months in South Africa, 1994. *S Afr Med J* 1996;86:354-7.
2. Statistics South Africa. The People of South Africa Population. Census, 1996. Census in Brief. Report No 03-01-11. Pretoria: Statistics South Africa, 1996.
3. Statistics South Africa. Mid-year estimates. Statistical Release P0302, 1999.
4. May J, ed. Poverty and inequality in South Africa. Report prepared for the Office of the Executive Deputy President and the Inter-Ministerial Committee for Poverty and Inequality. Durban: Praxis Publishing, 1998.
5. Department of Health. Integrated Nutrition Programme. Pretoria: Directorate Nutrition, 2000.
6. Nutriview. Vitamin A deficiency in South Africa. Roche: Basel, Switzerland, 1996.
7. Jooste PL, Weight MJ, Lombard CJ. Iodine concentration in household salt in South Africa. *Bull WHO* 2001;79: 534-40.
8. Hendricks MK, Saitowitz R, Fiedler JL, Hussey G, le Roux I, Makan B, Sanghvi T, Maglagang H, Dary O. An assessment of the feasibility, coverage and cost of a vitamin A food fortification programme in South Africa. *S Afr J Clin Nutr* 2001;14:46-55.

9. Sri Lanka

Case studies of successful micronutrient programs: The Sri Lankan experience

C. Piyasena

Sri Lanka has achieved considerable successes in the sphere of community health services owing to the well-established network of primary health-care workers. Immunization coverage of over 90% has been achieved, while growth monitoring is successfully implemented even at the remote village level. Advances have also been made in related sectors. For example, approximately 75% of the Sri Lankan population has a safe drinking water supply. The food authority has implemented a wide range of regulations by the food act ensuring food safety and hygiene. Food and agriculture policy has taken different dimensions during the last few decades, moving from the objective of self-sufficiency toward a free-market economy and liberalization of foreign exchange transactions, thereby increasing private sector participation and privatization of state enterprises.

Although low food acquisition power is a key factor exposing the poor sections of the community to a greater risk of micronutrient deficiencies, wrong beliefs and lack of knowledge have contributed to the present pattern of food consumption. Addressing issues of food quality, in line with goals set up by the World Health Organization and UNICEF, national policy makers endorsed and adopted a declaration and plan of action for the virtual elimination of vitamin A deficiency, the virtual elimination of iodine deficiency, and reduction of iron deficiency in women by one-third.

Clinical vitamin A deficiency is not commonly seen in Sri Lankan children. The latest survey in 1995-96 revealed that 36% of Sri Lankan preschool children had

suboptimal serum vitamin A levels, with the prevalence of night-blindness (0.8%) and Bitot's spots (0.8%) indicating vitamin A deficiency as a moderate public health problem in the country. Control measures have been implemented for some years, such as free distribution of milk, vitamin A supplementation, diagnosis and treatment of vitamin A deficiency at school medical inspections and hospitals, and provision of supplementary food fortified with vitamin A. Following the 1995-96 survey, vitamin A policy was reformulated, and the provision of vitamin A megadoses routinely to children and postpartum mothers was introduced. Achieved coverage rates have not been reported.

Iodine-deficiency disorders have long been recognized as an endemic problem in the southwest wet zone of Sri Lanka. Provision of potassium iodide to pregnant women and adolescent girls in high-risk areas was among the early interventions initiated in the 1950s. Surveys at that time revealed an increased prevalence of goiter in spite of interventions, which indicated that the increased prevalence of goiter was not due to iodine deficiency or was due to ineffective intervention.

Studies showed that the prevalence of goiter remained high in schoolchildren (19%) and pregnant women (63%). Based on these findings, a national program on salt iodization was adopted, and a universal salt iodization law was enacted from 1995. A follow-up national survey of iodine-deficiency disorders (2000) indicated a reduction in prevalence in one district (Kalutara) where the iodine-deficiency disorders control program had been implemented for more than five years, although the national data showed an increase in the prevalence of iodine-deficiency disorders from 19% to 21%. Moreover, the highest prevalence was

observed in the North-central province, previously a nonendemic area. The same study led to estimates of the prevalence of iodine-deficiency disorders from urinary iodine assays showing that the prevalences of mild, moderate, and severe iodine deficiency were 22%, 7%, and 1.4%, respectively. In pursuing improvement of the situation, Sri Lanka has identified the need to determine thyrotropin levels of newborns and to develop a database on the iodine content of foods, goitrogens in local foods, and the effects of fertilizer, pesticides, and insecticides on the bioavailability of iodine in food.

Anemia is a major public health problem in Sri Lanka, affecting all segments of the population and contributing to increased morbidity and mortality rates. Anemia prevalence in 1973 was estimated as 38% among men, 68% among women, 70% among primary schoolchildren, and 52% among preschool children. The prevalence was 60% among pregnant women in 1988–89. In 2001 the prevalence was estimated as 32% among nonpregnant women, 30% among pregnant

women, 22% among adolescents, 21% among primary schoolchildren, and 30% among preschool children. Operational studies on the iron-supplementation program have indicated that further strengthening is required to achieve optimal results. A comprehensive national strategy was formulated, including iron/folate supplementation to all pregnant women; antihelminthic use and malaria control; promotion of dietary diversification; information, education, and communication (IEC) campaigns to improve compliance; provision of safe drinking water and sanitation; and proper monitoring and further research to improve efficiency and effectiveness. Additional target groups to be included were infants, preschool children, schoolchildren, nonpregnant women, and displaced persons. The possibility of iron fortification as a strategy has been looked into. Challenges ahead for optimal control are proper monitoring and evaluation, securing adequate human resources, improving the bioavailability of micronutrients in foods, promoting food-based methods, and issues related to iron fortification.

10. Thailand

Current situation and status of micronutrient policies and programs in Thailand

P. Winichagoon, T. Pongcharoen, and J. Yhoung-aree

Thailand has set goals for alleviating three major micronutrient deficiencies that since the early 1980s have been regarded as major public health problems. The prevalence of vitamin A deficiency has decreased, along with the reduction of protein–energy malnutrition among young children and mothers. Iodine and iron deficiency, however, have required additional efforts through salt iodization and iron-supplementation programs during the past two decades. Currently, clinical micronutrient deficiencies have become rare, and the severity of persisting deficiencies has declined to the subclinical level. These remain a significant challenge.

Iron supplementation is the major program addressing anemia during pregnancy. The anemia surveillance system has been an integral part of the efforts to alleviate anemia among school-aged children and pregnant women. Village health volunteers provide the major resource for identifying pregnant women and advising them to attend antenatal care, as well as promoting safe delivery in the hospital. Daily iron supplementation has been provided throughout pregnancy, but adherence

to supplementation is not monitored. Severe anemia among pregnant women has substantially declined as a result of improving the referral system and ensuring compliance to iron therapy. There have been no specific programs for anemia in infants, preschool children, or adolescent girls. Meanwhile, weekly supplementation in primary schools has been piloted but not yet expanded nationwide.

Legislation for iodization of salt has been a major step forward as a nationwide strategy to alleviate iodine deficiency. Continued attention is still needed to ensure the sustainability of salt iodization and household consumption of iodized salt. Cyclic monitoring of the iodine-deficiency situation has been launched, and data on urinary iodine from pregnant women and school children are being used to monitor the situation. Fortification of various foods to address multiple micronutrient deficiencies has been studied, and some products have been commercialized. Partnerships among government, the private sector, and academics have been established since the early stage of the program. The private sector and academic institutions have worked together to formulate the products, and government sectors assist in promoting the use of fortified foods. Systematic evaluation of these programs will be useful in elucidating lessons learned from Thailand.

The authors are affiliated with the Institute of Nutrition, Mahidol University (INMU), Nakhon Pathom, Thailand