

Are we neglecting iodine nutrition in South Africa?

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Micronutrient malnutrition is often referred to as “hidden hunger” and remains a major public health concern in low- and middle-income countries.¹ Iodine deficiency is one of the most commonly occurring micronutrient deficiencies,² and the leading single cause of preventable mental retardation in the world.³ The fortification of salt with iodine is the most cost-effective strategy to ensure adequate iodine intake in a population.^{4,5} Its implementation around the globe has resulted in a marked reduction in iodine deficiency and related disorders, and is considered a public health triumph.⁶ However, continued monitoring and surveillance remain crucial for its success.⁷

In South Africa, voluntary iodisation of table salt (10–20 mg iodine/kg at production level) has been recommended as early as 1954, and was made mandatory at a level of 40–60 mg iodine/kg salt in 1995.⁸ The fortification range was later widened to 35–65 mg iodine/kg salt. The most commonly used measures of iodine nutrition at the population level include the determination of median urinary iodine concentrations (mUIC) as well as household coverage with adequately iodised salt.⁷ The last national survey assessing iodine nutrition in the South African population was conducted in 2005 (9). The mUIC in women of reproductive age (177 µg/L) and in school-aged children (215 µg/L) indicated adequate iodine intake (median UIC >100 µg/L for these population groups). Furthermore, 77% of surveyed households were using iodised salt (salt iodine concentration >15 mg iodine/kg salt at household level). Based on these results from almost 15 years ago, South Africa is currently considered an iodine sufficient country. However, according to global recommendations, household level data on salt iodine content and population-based UIC data should be collected every five years.⁷

Iodine requirements increase sharply during pregnancy, and the consequences of inadequate iodine intake during pregnancy can result in irreversible neurodevelopmental impairment in the foetus.¹⁰ The recommended dietary allowance (RDA) for iodine is 250 µg/day for pregnant women compared to 150 µg/day for non-pregnant women.¹¹ Thus, even if school-aged children and women of reproductive age have adequate iodine intake, vulnerable population groups like pregnant women may remain at risk for deficiency. The lack of data on iodine status in South African pregnant

women and the limitations of using data from school-aged children as a proxy for iodine status in the general population motivated the study by Mabasa and colleagues.¹²

The authors determined iodine status of 565 conveniently sampled pregnant women and their children (n = 116) aged 6 to 12 years feeding from the same food basket in the Limpopo province of South Africa. The mUIC of 164 µg/L (interquartile range: 92 – 291 µg/L) in pregnant women indicated sufficient iodine intake (mUIC >150 µg/L cut-off for adequate iodine intake in pregnant women).¹² In contrast, the mUIC in children (386 µg/L [200 – 525 µg/L]) was more than twice as high as the mUIC of their pregnant mothers and indicated potentially excessive iodine intake. Reasons for this large discrepancy in iodine status are not clear but are likely due to differences in consumption of iodine containing foods, as discussed by the authors.

While drinking water in the Limpopo province naturally contains iodine, as opposed to drinking water in other South African provinces (except from the Northern Cape)⁹, only 52.5% of households used adequately iodised salt.¹² This is clearly lower than the international goal of reaching a 90% household penetration with iodised salt⁷, and emphasises the importance of continued monitoring of salt iodisation at production sites. Furthermore, as the authors alluded, the importance of adequate iodine nutrition and use of iodized table salt for food preparation should be included in educational efforts, especially in rural areas where non-iodised agricultural salt remains being sold by informal food vendors for human consumption.

The South African salt fortification policy stipulates that all table salt must be fortified with iodine, while the iodisation of salt used for food production or animal consumption is voluntary.⁸ However, with the ongoing nutrition transition in South Africa, the consumption of discretionary salt (salt added either during cooking or at the table or both) is steadily declining while the intake of non-discretionary salt (salt in processed foods) is rising rapidly.^{13,14} In response to this trend, which is occurring in many countries, the World Health Organization now strongly recommends that “All food-grade salt used in household and food processing should be fortified with iodine as a safe and effective strategy for the prevention and control of iodine deficiency disorders in populations living in stable and emergency settings”.⁵

An additional argument for considering a revision of the South African salt fortification policy is the potential impact that the recently introduced salt reduction policy may have on the iodine status of South Africans.¹⁴ The salt reduction policy was implemented in 2016 as part of the National Department of Health's strategic plan for the prevention and control of non-communicable diseases. Its goal is to reduce the mean population salt intake from currently 8-10 g/day to <5 g/day by mandating maximum salt levels in frequently consumed processed foods and salt awareness campaigns. Charlton and colleagues recently demonstrated in a nationally representative sample of 875 South African adults that 24-hour urinary iodine excretion positively correlated with 24-hour urinary sodium excretion (a marker of salt intake).¹⁵ Furthermore, the results indicate that the adults who met the recommended salt intake of <5 g/day did not meet the Estimated Average Requirements (EAR) for iodine intake (calculated from 24-hour urinary iodine excretion). Thus, the authors emphasised the importance of close iodine status monitoring in populations undergoing salt reduction efforts.

As highlighted by Jooste and Zimmermann in 2008, the implementation of the salt iodisation policy has resulted in a remarkable progress in the prevention and management of iodine deficiency disorders in South Africa. However, the study by Mabapa and colleagues is an important reminder that data on iodine status of the South African population is outdated and that special attention needs to be given to population groups vulnerable to deficiency, such as pregnant women. Furthermore, not only may the monitoring of household salt iodisation be neglected, but changes in salt consumption behaviour and the new salt reduction policy may pose a threat to iodine nutrition in South Africa.

Thus, continued efforts should be invested into the evaluation of the effectiveness of the South African salt iodization programme. This includes examination of iodine status in different population sub-groups and close monitoring of the

iodine content in household salt as well as salt used by food manufacturers. These data are needed to inform future policy revisions.

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