Two decades of sustained salt iodization in Sri Lanka


History of iodine deficiency and its management in Sri Lanka
Bennet and Pridham first referred to the existence of endemic goiter along the coast of Galle in the southern province of Sri Lanka in 1849. Mahadeva and his group in 1960 identified a “goiter belt” extending across the western, central, southern, sabaragamuwa, and uva provinces in Sri Lanka. The high annual rainfall in these regions led experts to believe that iodine was washed from the soil, leading to iodine deficiency. At that stage, almost no goiter had been identified in the northern, eastern, and north-western provinces. However, in 1986, Fernando described a high goiter rate of 18.8% in schoolchildren in 17 of 24 districts in Sri Lanka—a variable prevalence of 6.5% in the Matale district and 30.2% in the Kalutara district.

USI was introduced nationwide by the government in 1995 by statutory regulation [11]. This legislation banned the sale of non-iodized salt for human consumption, thus ensuring access to iodized salt to all consumers in the country. Potassium iodate was used as the vehicle of iodine supplementation, and added to salt at an optimal concentration of 50 ppm at producer level and 25 ppm at consumer level. The national reference laboratory for monitoring USI was established at the Medical Research Institute (MRI) in 2000 with the aid of UNICEF. This laboratory has the dual role of monitoring USI and of assessing its clinical impact by performing periodic national iodine surveys (NISs). External quality control is linked to the EQUIP program of the Centers for Disease Control (CDC), Atlanta, Georgia, USA [12].

Repeated national surveys show iodine sufficiency
Since the introduction of USI, four national iodine surveys have assessed the iodine nutrition status of the population. The authors retrospectively reviewed median urine iodine concentration (mUIC) and goiter prevalence in 16,910 schoolchildren (6–12 years) in all nine provinces of Sri Lanka, the mUIC of pregnant women, drinking-water iodine level, and the percentage of households consuming adequately (15 mg/kg) iodized salt (household salt iodine, HHIS).

Over this period, the mUIC of schoolchildren increased from 145 μg/L (interquartile range (IQR) = 85–240) in 2000 to 233 μg/L (IQR = 159–316) in 2016, but stayed within recommended levels (Figure 1). There was positive association between mUIC in schoolchildren and water and household salt iodine concentration (Figure 1). Goiter prevalence to palpation was a significantly reduced from 18.6% to 2.1%. In pregnant women, median UIC increased in each trimester (102 (62–147); 218 (116–313); 273 (229–338) μg/L).

The authors concluded that the introduction and maintenance of a continuous and consistent USI program has been a success in Sri Lanka. In order to sustain the program, it is important to continue to carefully monitor iodine status while tracking salt-consumption patterns to adjust the recommended iodine content of edible salt.
FIGURE 1: Median urine iodine concentration (IQR) and its relationship with iodine concentrations in household salt (left) and drinking water (right) in Sri Lankan school children aged 6–12 years in 2016.