Iodine excess or not in China?
Analysis on the necessity of reducing the iodine content in edible salt based on the national monitoring results


Editor’s note: China introduced a USI policy in 1995 with all edible salt iodized according to a national standard, currently 35 ppm. In 2010, household coverage of adequately iodized salt exceeded 95%, and was below 80% in only 33 of China’s 2831 counties, most of them in western provinces. The following article is an abridged version of the recent paper “Iodine excess or not: analysis on the necessity of reducing the iodine content in edible salt based on the national monitoring results” published in the Asian Pacific Journal of Clinical Nutrition by Sumei Li and colleagues. This important paper reviews and analyzes experiences over the past fifteen years with regard to salt iodization and iodine status in China (1995-2009) and points out the value of understanding other potential sources of iodine in the Chinese diet, such as drinking water and processed foods.

Since 1995, China has implemented a policy of USI in which it has been mandatory for all edible salt in the country to be iodized according to national standards, and the coverage of iodized salt throughout the country has been closely monitored by a comprehensive monitoring system. The results of five national IDD surveys carried out between 1995-2005 indicate that the household coverage of iodized salt increased from 80.2% in 1995 to 94.9% in 2005. The median iodine content in household salt increased from 16.2 mg/kg in 1995 to 42.3 mg/kg in 1999, which led to an adjustment on the iodine content in iodized salt and the level subsequently declined to 30.8 mg/kg by 2005. The annual county-level salt monitoring data has been in place since 2004 and shows that the national coverage of

The USI program in China is a public health triumph ensuring millions of Chinese children can learn well at school.
iodized salt at the household level has been higher than 95%, while the coverage of qualified iodized salt has been sustained above 90%. The median iodine level in salt assessed through the county level monitoring has consistently been around 30 mg/kg.

National IDD survey results from 1995 noted that the median urinary iodine (UI) of schoolchildren aged 8-10 was 164.8 μg/L, reflecting an adequate level of iodine, but the percentage of low UI values (<100 μg/L) was 37.4%. The median UI in 1997 and 1999 had risen to over 300 μg/L for the country as a whole, and the percentage of low UI values (<100 μg/L) had declined to 16.8% by 1999. However, at the same time, the percentage of ‘excessive’ UI values (>300 μg/L) had rapidly risen to 44.3%. These data prompted a reduction in the upper limit of the standard for iodized salt (from 60 to 50 mg/kg).

Subsequent data showed that the median UI declined to 241 μg/L and 246 μg/L in 2002 and 2005, respectively (Figure 1). The median UI of five provinces was still above 300 μg/L in 2005, indicating that there was a sustained risk of excessive iodine intake. At the national level, the frequency distribution of UI in 2005 showed 15.7% of the population had low values (<100 μg/L) and 30.6% had elevated levels (>300 μg/L).

Over time, an analysis of the IDD monitoring data suggested that there were additional sources of iodine in the diet beyond that being provided exclusively from iodized table salt. This conclusion was based on the observation of excessive UI levels in spite of the fact that the level of iodine in salt was well within the range of what was deemed ‘acceptable’, and the salt consumption patterns would not have explained that iodized salt in the diet was the sole determinant of the population iodine status. As a result, the Ministry of Health (MOH) embarked on an ambitious effort to identify other sources of iodine, primarily in the water supply and local foods during 2005-2009. This led to the identification of iodine excess areas in 11 provinces (districts, cities) of China, involving some 122 counties. In these areas, considered to have ‘high iodine intake’, the government and the National Salt Corporation decided to limit the distribution and availability of iodized salt to households.

The current standard for “qualified iodized salt” of 35 ± 15 mg/kg has been consistently applied by all major salt producers in China, following three adjustments resulting from ongoing surveillance of the iodine status of the population. It has become evident that through the intensive efforts of many partners, universal salt iodization in China has been effective in improving the iodine status of the population. However, as the program matured, there has been increasing concerns on problems of excessive iodine intake. The IDD program monitoring results provide evidence that excessive iodine intake among populations has existed in some areas for many years, including those with naturally occurring iodine. Taken together, monitoring data suggest that the iodine content in edible salt could be lowered and adapted to local specific conditions to reduce the risk of excessive iodine intake, rather than adopting a single, “one size fits all” standard.

Figure 1: Urinary iodine in Chinese school-aged children at the national level, 1995 to 2005.