Iodine intakes are borderline adequate in war-torn Yemen
The Republic of Yemen, in the southern part of the Arabian Peninsula, has a population of 26 million, of which almost three-quarters live in rural areas. Topographically, the country can be divided into two broad regions: the highlands, which cover 60% of the total landmass, and the coastal/inland plains (40%). An emerging economy, Yemen’s path toward development has been marred by protracted political and military unrest, making it one of the least developed countries in the world (1).

Yemen remains iodine sufficient, but intakes are declining
In 2015, the Ministry of Health together with UNICEF and WHO conducted a national survey of iodine status and iodized salt coverage, with technical support from the Iodine Global Network, and funding from USAID and the European Commission (2). Initiated just before the escalation of military conflict in 2015, the survey was a success mostly thanks to the dedication and effort of the country team and support from all partners with the collection and transport of samples and data analysis in spite of difficult circumstances.

Particularly at risk of iodine deficiency are populations living in the mountains and highlands (Table 1). In sub-mountainous and lowland regions (Internal Plateau and Desert, Arabian Sea Coast, and Red Sea and Tihama Coast), where more fish is consumed, iodine levels are higher.

Urgent need to revitalize the salt industry
In the survey, household salt samples were analyzed using a semi-quantitative WYD Iodine Checker, which found that <5% of households used adequately iodized salt. This leaves the majority of the population vulnerable to iodine deficiency and poses a threat to future productivity. This problem affects, primarily, the poorer communities, according to Dr. Izzeldin Hussein, IGN Regional Coordinator for MENA. “Well-educated people are more likely to know how to get iodine in their diets, and they may be better able to buy iodized salt. But for poorer people such as farmers or fishermen, iodized salt needs to be readily available on supermarket shelves,” said Dr. Hussein.

Challenges and opportunities
Just two years after the introduction of mandatory salt iodization in 1996, the availability of iodized salt had increased significantly. It was even suggested that, at the factory level, more than 90% of all salt was iodized (3). But despite this early progress, by 2010 the proportion of iodized salt at the markets was only 30% according to a UNICEF-led study (4,5). Poor technical performance and a lack of regulatory monitoring capacity were quoted as key factors leading to this decline. Accordingly, in 2013, the Ministry of Health and Population warned that the market was being inundated with poorly iodized salt despite a claim on the label that the salt was meeting the national standard of 40 mg iodine per kg, and that prices of iodized salt varied considerably (5).

The national median urinary iodine concentration (UIC) in school-age children (6–12 years old, n=1,237) was 101 µg/L. Although this median remains adequate, it marks a significant decline in comparison with previous national data (see Box on page 3).
Yemen’s efforts to eliminate iodine deficiency

Before 1991, iodine deficiency disorders were not perceived by the Yemeni health authorities to be a public health problem. Although the national nutrition survey of the Yemen Arab Republic (7) in 1979 did not investigate iodine nutrition, a similar survey in the former South Yemen (8) in 1983 reported a total goiter rate (TGR) of 0.15%. Less than a decade later, WHO conducted a rapid goiter survey in four governorates in the northern part of Yemen and reported a TGR of 32% among schoolchildren, suggesting IDD was, in fact, a severe public health problem (9). Subsequently, in 1995, UNICEF in collaboration with the Ministry of Public Health launched a national IDD control program of universal salt iodization. As part of the strategy, the government passed its salt iodization legislation in 1996, enforced from October 1997.

Four years later, Yemen undertook the first nationwide survey to estimate the rates and severity of iodine deficiency, and the proportion of households consuming iodized salt. The survey, conducted in 2,984 school-age children (6–12 year old), found that the goiter rate in the highland region was four times higher than on the plains (31.1% vs. 7.4%); however, most goiters were grade 1. The national median urinary iodine concentration (UIC) was 173 µg/L, indicating an optimal iodine status. The median UIC was also adequate in the Yemeni highlands, although lower than on the plains (136 µg/L and 189 µg/L, respectively). A qualitative analysis of salt samples with rapid test kits revealed that just over a half of Yemeni households (54.1%) were using iodized salt – nearly a three-fold increase over the rate of 22% reported in 1996 (10). These results provided clear evidence of the rapid progress made in Yemen against IDD in just 30 months following the initiation of a universal salt iodization program.


An attainable goal in a war-torn country

More than two years of relentless conflict have left an estimated 17 million people – 60 per cent of Yemen’s population – in need of aid (6). The provision of iodized salt as part of humanitarian relief should be prioritized, working with the local salt industry to ensure a steady supply. “As much as we can, we need to supply iodized salt in the food aid baskets to reach those people in the regions most affected by the war,” said Dr. Hussein. “At the same time, long-term improvements to the program should be put in place so that, as the conflict resolves, the iodine needs of the population may be met.”

Because more than 90% of the salt supply in Yemen is locally mined or harvested, and the country has one of the region’s largest salt mines, in Al-Salif District, the situation is conducive to successful salt iodization. However, according to the survey, assistance needs to be extended to the main salt factories, including technical support to improve the iodization capacity, enhanced marketing, and provision of a sustainable supply of potassium iodate at competitive market prices. To strengthen the regulatory capacity, and hold producers accountable through robust monitoring and surveillance, active partnerships between all relevant sectors are essential. In the short term, it may be prudent to provide salt producers with potassium iodate free of charge, while cost recovery systems are established so that the supply of KIO3 can be absorbed by the industry and consumers in the future.

The provision of iodized salt and the elimination of iodine deficiency should be considered one of Yemen’s more attainable humanitarian relief needs, one which could help the country defray some of the hardship of war and conflict. Yemen certainly has the capability to quickly transform its industry and reach the same level of success as its neighbors. “Yemen is one of the priority countries in the MENA region, and we need to find ways to improve the situation. Eliminating iodine deficiency in school-age children would be a small but important achievement,” said Dr. Hussein.

References