Iodine-rich groundwater, and not iodized salt, provides children and pregnant women in Djibouti with sufficient iodine

A small country in the Horn of Africa, Djibouti has a population of less than 1 million, with six out of ten inhabitants living in the capital city. It is bordered by Eritrea in the north, Ethiopia in the west and south, and Somalia in the southeast. The remainder of the border is formed by the Red Sea and the Gulf of Aden, with access to the Indian Ocean, in the east.

A survey carried out in 2002 reported a goiter rate of 30% and a low concentration of urinary iodine among school-age children (SAC) (1). Although the iodization of salt is mandatory in principle (2), the country does not have a facility to produce salt, and there is a lack of regulatory or programmatic support to enforce the 2002 decree on salt trade. A MICS survey in 2006 found that the majority of salt on the market was non-iodized, with a household coverage of less than 1% (3). In 2015, the IGN in partnership with UNICEF supported a new national iodine survey in Djibouti to assess the current status of iodine nutrition among SAC (n=1,000) and pregnant women (n=230), and access to iodized salt. Urine samples from SAC and salt samples were collected from households. Pregnant women in the second and third trimesters were recruited from 18 health clinics: 13 in the capital and 5 in the other districts.

**High levels of iodine are found in groundwater**

The median urinary iodine concentration (UIC) in school-age children was 335 µg/L (IQR: 216, 493) and in pregnant women was 265 µg/L (IQR: 170, 445), suggesting that iodine intakes are borderline excessive among children but adequate among pregnant women. Yet, the iodine concentration in household salt was found to be very low, with a median of 2.2 mg/kg (IQR: 2.2, 4.2), confirming the findings from the 2006 MICS. Consumed in normal quantities, salt iodized to this level would not contribute significantly to iodine intakes. In this region of Africa, particularly in Somalia, reports have described excessive iodine concentrations in groundwater as a source of iodine intake in the population. Indeed, a recent small-scale follow-up survey of water sources in Djibouti found that water iodine concentration is high, at 127 µg/L, suggesting that consumption of iodine-rich water at the household level is likely a major source of iodine intake in Djibouti. Although excessive iodine intakes have been linked to thyroid disease (goiter, thyroid autoimmunity, and an increased risk of hypothyroidism) (4), the thyroid gland can usually adapt to the higher intakes and retain normal function if consumption is high over long periods of time (5).

**Supporting IDD prevention in Djibouti**

In March 2017, Dr Izzeldin Hussein (IGN Regional Coordinator for Middle East and North Africa) visited Djibouti to communicate the findings of the surveys to policymakers and regional UNICEF and WHO representatives, and to discuss their implications for national nutrition policy. In many settings, excessive iodine intakes can co-exist with iodine deficiency (5-7). Therefore, to ensure that iodine intakes are both adequate and appropriate, it is crucial to focus on surveillance of iodine intakes from all sources, including the contribution from groundwater. The government of Djibouti will be supported to develop a strategy for IDD prevention that would be led by the Ministry of Health, with multi-sectoral support.

**References**

2. Legislation for Salt Iodization (June 2016). Downloaded from: http://www.ign.org/cm_data/Salt11X14.png