Kosovo

Historically, the Kosovo federal unit of former Yugoslavia was known for endemic goiter areas, such as Deçan, Peja, Gjakova and Prizren municipality, where studies conducted in the 1960-1980s showed 30-60% goiter, indicative that the common diet is iodine deficient. Soil analyses by the agricultural agencies demonstrated very low iodine levels in most of Kosovo. Yugoslav regulations dating of 1993 mandated that edible salt should be iodized at 12-18mg iodine/kg, using either KI or KIO_3. Since the Balkan conflict, Kosovo became administered by an Interim UN Mission with oversight by a Special Representative of the Secretary-General of the United Nations. In 2001, the National Institute of Public Health (NIPH) collaborated with the Institute of Food and Nutrition in Rome, Italy in a National Micronutrient Status Survey of Kosovo (1). The results showed that although adequately iodized salt (≥15ppm by RTK) was used in 84% of the households, the iodine status among school-age children and non-pregnant women of childbearing age was borderline (around 50% of UI levels were <100µg/L in both groups).

All the salt requirements of Kosovo are imported. Import and market monitoring in 2003 showed that the salt originates from various sources, with Montenegro (the Ulcinj factory) taking ±one-third of the total at that time. Another key source of the salt supplies in Kosovo is the Tuzla factory in Bosnia-Herzegovina, directly and via Belgrade. Shipments from Macedonia (Skopje) and Slovenia made up the remainder. Reportedly, the border at Peja handles approx. 95% of the salt imported into Kosovo (2).

The findings of the 2001 survey prompted the Government to promote USI more vigorously. The MOH strengthened national oversight and adopted USI, i.e. iodization of all the salt, including the salt used in the food manufacturing industry. A multi-sector IDD (and other micronutrient deficiencies) Working Group was created and collaboration was intensified among NIPH, the Sanitary Inspection and the Kosovo Veterinary and Food Agency to ensure the quality of the national salt supplies by inspections at the border crossings and follow-up of the quality of iodized salt in the markets and food industries.

After a pilot study during 2004 in 10 primary schools of Deçan municipality showed a clear improvement of the iodine status among school-age children (3), NIPH carried out a preliminary survey in 2007 among 2nd grade primary school children from one urban and one rural location in each administrative region. The children were asked to bring a salt sample from home, and goiter was palpated by clinicians with assistance of the Institute of Patho-physiology and Nuclear Medicine, Skopje, Macedonia. The survey results (3) showed that 79% of the household salt samples had ≥15mg iodine/kg; the median UI was 161µg/L and palpable goiter was found in 9% of the children. On statistical analysis, the children's UI levels were not associated the presence/absence of goiter or the household salt iodine levels, which suggests that the salt used in the food industry, such as bakeries and dairies, was also iodized.

During 2004-2007, also issues of program operational nature became discussed in the regular Working Group meetings, including the option to revise the mandated fortificant and salt iodine levels. During 2008, the MOH endorsed an Administrative Instruction to require 30-40mg KIO_3 per kg salt (18 - 23mg iodine/kg) at importation (4). The salt inspections at the Peja border became accompanied by social mobilization activities using all communication channels and NIPH started consolidating the monitoring and program information in a national database (5). The data of the salt inspections at the border show that the iodine content in the salt supplies of Kosovo was improving over the years. During the 3y period 2006-2008, 10 (3%) out of the 323 shipments were re-directed to purposes other than consumption because of failure against the iodization norms. The median SI content of all shipments improved from 26mg in 2006 to 28.5mg KIO_3 per kg in 2008. The histogram of SI values from all the inspections during 2006-2008 (Figure 1) shows the majority within the range of 20-40mg KIO_3/kg (12-24mg iodine/kg).

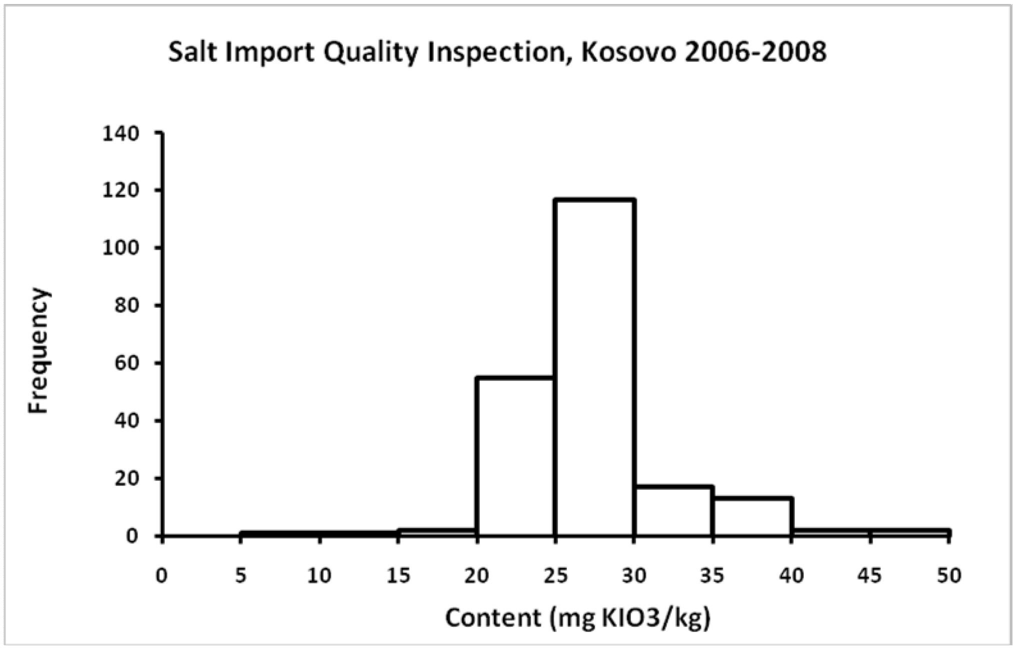

Figure 1: Salt inspection results of 323 import shipments, 2006-2008

During 2008, a private company near the capital Pristine started importing non-iodized salt to process iodized consumer salt for sales in Kosovo. This private company is operating in conformity with the new Administrative Instruction, and the company collaborates closely with NIPH.

Encouraged with the progress thus far MOH requested NIPH to undertake an assessment of the food consumption and anemia situation in Kosovo and in 2009, a national survey for that purpose was combined with the collection of iodine population indicators. The underlying justifications for the insertion were (a) to address some shortcomings in the 2007 survey related to representativeness of the dietary iodine supply and iodine status measurements, and (b) to assess whether the Administrative Instruction of MOH had led to universal good quality iodized salt supplies for the population, including pregnant women. The survey was conducted during Spring 2009 (6) using the recommended 30x30 design with primary schools as clusters selected proportionate to school population size. In each school, 30 children aged 5-14y were enrolled when they had also a pregnant woman living in their household. A salt sample from each household was obtained for quantitative titration and a urine sample from each of the children and women was measured for the iodine concentration in the NIPH lab, which participates successfully in the EQUIP quality assurance program for urinary iodine provided by CDC Atlanta (7). The UI values of the children were converted to iodine consumption estimates with the formula of IOM (8).

Notably, not a single household salt sample in this survey was found to be non-iodized. The frequency distribution had a median of 16.5mg iodine/kg and a range from 8.8 to 29.6mg/kg; 605 (67%) of the salt samples measured ≥15mg/kg.

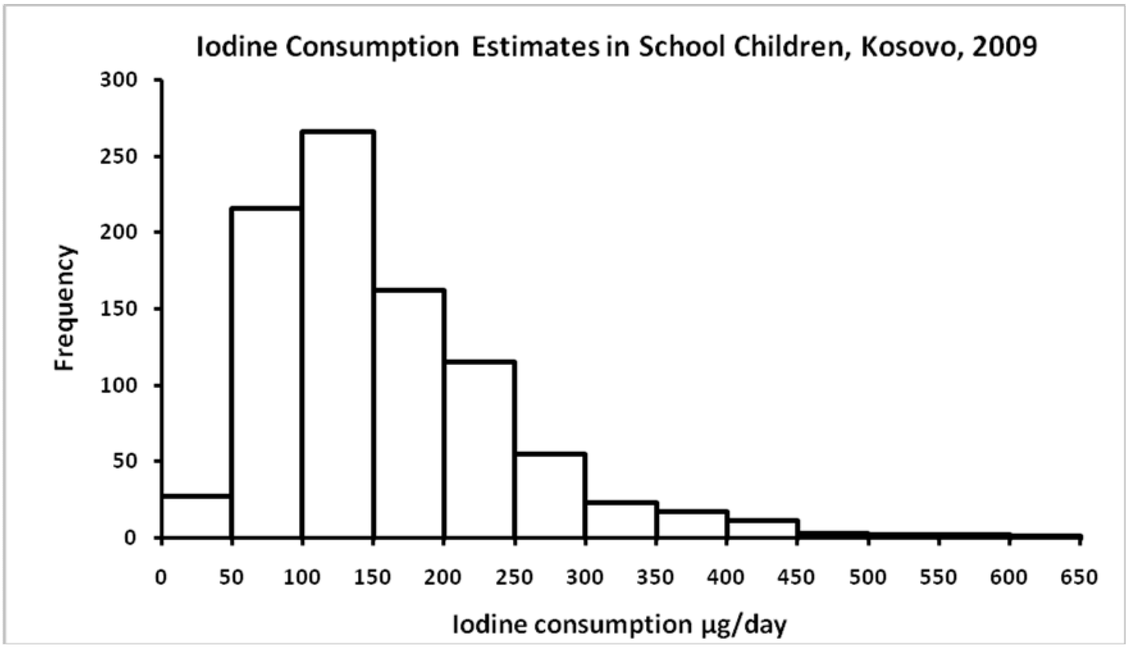

Figure 1: Estimated iodine consumption estimates in school children

The median UI in the children was 176µg/L (95% CI: 168-182) and the UI ranged from 43 to 486µg/L. The UI was <100µg/L in 4.9% of the children, 54.2% had UI between 100 and 199µg/L, and 12.2% of the UI concentrations were ≥200µg/L. The frequency histogram of iodine *consumption* in the children (Figure 1) had a median of 137µg/d (95% CI: 129-144) and a range of 26-636µg/d. The intake estimates did not differ significantly between boys (median 137µg/d) and girls (138µg/d), between urban (129µg/d) and rural (142µg/d) areas, or in households using salt iodized with KI (140µg/d) or KIO_3 (136µg/d). As expected, there was a significant relationship of iodine consumption with age: The iodine intake in the children increased from ±80µg/d at age 5-6y to ±200µg/d at 13-14y of age. Expressed in recommended dietary allowance (RDA) as defined by IOM (8), the children in Kosovo were typically consuming a diet that supplies 124% of their RDA for iodine. Upon further analysis, no relationships were found between the iodine consumption of children and the iodine content of the household salt.

The histogram of UI *concentrations* among pregnant women was skewed (Figure 2). The median UI was 183µg/L (95% CI: 173-187) and the range 27-632µg/L. There were no significant differences in UI levels between urban (median 174µg/L) and rural (184µg/L) areas, nor was a significant relationship found with the women's level of education (p=0.57), pregnancy duration (p=0.60) or pregnancy semester (p=0.99). Pregnant women living in households using salt iodized with KI (median 186µgL) had a slightly higher UI (p<0.05) than those in the households using salt iodized with KIO_3 (176µg/L). As was the case in children, the UI among the pregnant women did not vary with the different levels of iodine content of the salt in their households.

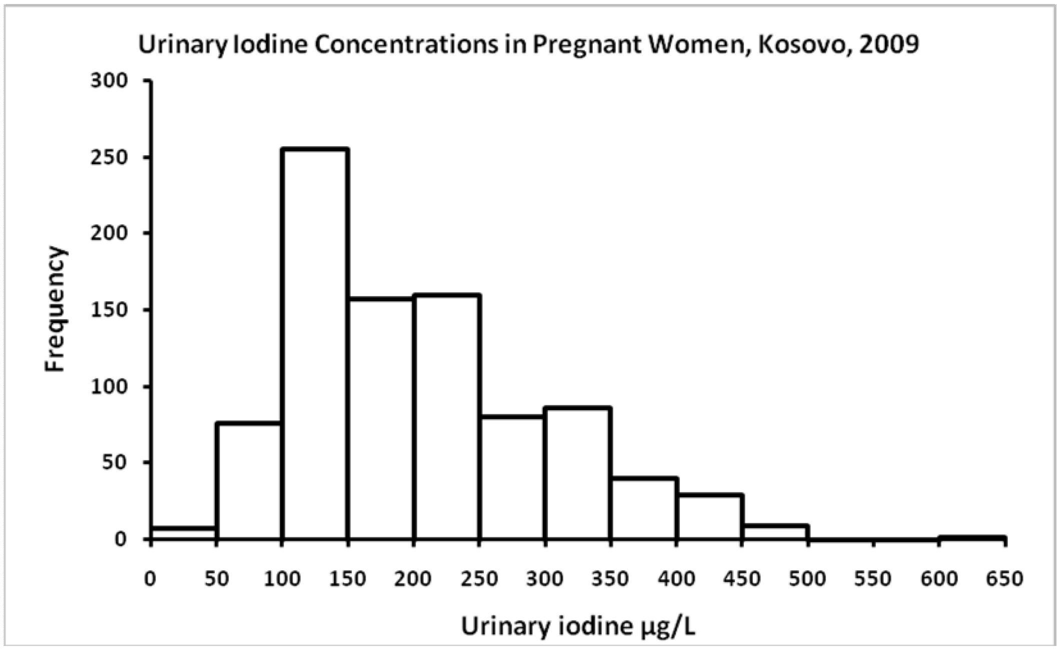

Figure 2: UI concentrations in pregnant women, Kosovo, 2009

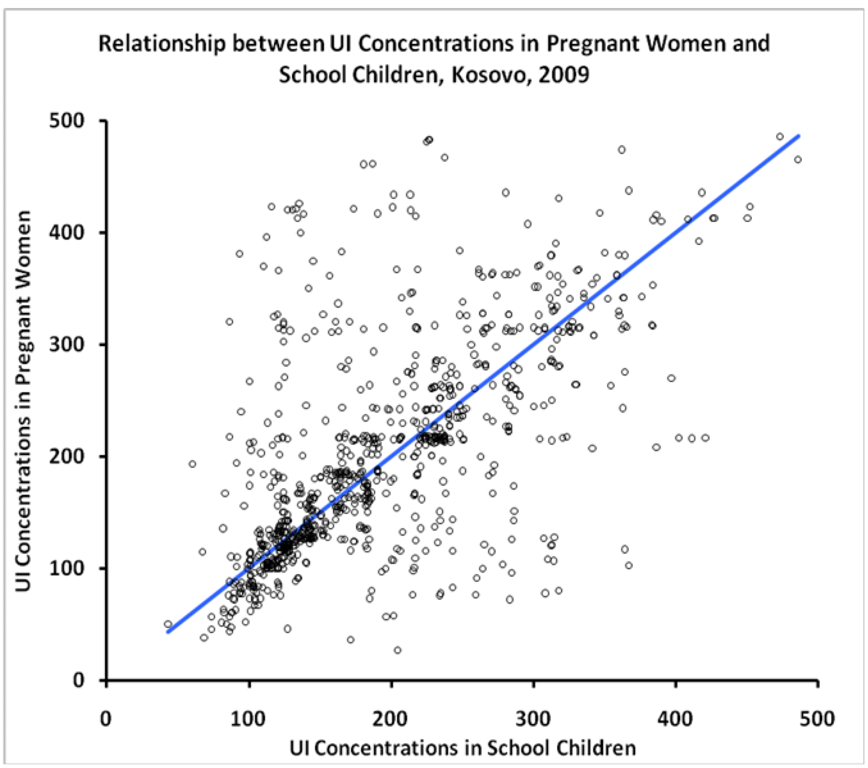

Figure 3: UI concentrations in pregnant women and school-age children living in the same households, Kosovo, 2009

The UI concentrations of the pregnant women and their children were strongly correlated ($r=0.63$, $p<0.0001$). Figure 3 shows the scatter plot and regression line. The slope of regression ($b=1.002$; 95% CI:

0.98-1.03) was not statistically different from unity, indicating that the UI concentrations among the women and children of the same households were indistinguishable. This relationship was not different for households using salt iodized with either KI or KIO_3.

Concluding, the experiences from the past 5-10 years are testimony of the outstanding progress in Kosovo toward the goal of sustained elimination of iodine deficiency in the population. The successful national USI attainment is evident from a detailed iodine survey in 2009 among school-age children and pregnant women from households throughout Kosovo. The results indicate universal use of adequately iodized salt in households and the food processing industries, in association with optimum status among the entire population. This success was generated by close, enlightened collaboration of partners from public, private and civic organizations. The salt imports into Kosovo are being closely monitored for adequacy; public awareness IDD and USI are part of the history; and pertinent knowledge has been inserted in educational curriculums. The National Coalition is active in reviewing progress and it reports publicly on regular basis. The Government has adjusted the regulations in response to the results of monitoring the iodine supply and nutrition situation in the population.

Figure 4: Salt iodization logo Kosovo

The Ministry of Health in Kosovo is assembling the evidence of progress to submit a formal request for acknowledgment of successful goal achievement by the global Network for Elimination of Iodine Deficiency.

Participation of national officers in UNICEF-supported regional iodine meetings:

- Workshop on Strengthening Strategies for the Elimination of Micronutrient Malnutrition. Antalya, 4-8 April 2005

- Workshop on Strengthening of Laboratory Capacity and Iodine Status Assessments for Monitoring of Sustained IDD Elimination through USI in the CEE/CIS Region. Istanbul, Turkey, 18-19 May 2006

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4. Progress toward IDD elimination in Kosovo, 2008. Internal UNICEF document

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8. Institute of Medicine, Academy of Sciences, USA, 2001. Dietary reference intakes of vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium and zinc. Washington, DC, National Academy Press