Iodine villages thrive across Thailand

IODINE GLOBAL NETWORK (formerly ICCIDD Global Network) is a nongovernmental organization dedicated to sustained optimal iodine nutrition and the elimination of iodine deficiency throughout the world.
Thailand first launched its National IDD Elimination Program in 1989. A National Committee for IDD Control was established two years later, and it has been presided over by Her Royal Highness Princess Maha Chakri Sirindhorn. The Ministry of Public Health together with collaborating agencies spearheaded the implementation of effective strategies to prevent and control IDD, with a focus on universal salt iodization (USI).

To track the country’s progress towards IDD elimination, regular monitoring has included measuring iodine levels in iodized salt at the point of production, distribution, and in the household, and urinary iodine concentration (UIC) in pregnant women. All salt should be adequately iodized

Since the launch of the program, the government has encouraged salt producers to supply adequately iodized salt. The first ministerial mandate, issued in 1994, specified that iodine should be added to edible salt at a minimum of 30 mg per kg. In 2010, it was revised to include all salt for human and animal consumption, and the iodization range was changed to 20–40 mg/kg. To broaden the reach of the iodization program, additional regulations were issued for fish sauce, salt brine, and seasoning products made from soy beans. These salty condiments must contain iodine at 2–3 mg per liter, or they must use iodized salt in production. There are 281 iodized salt production sites including five large, 51 medium, and 225 small enterprises. Government subsidies have provided 100 iodine mixing machines to the smaller plants. Of these, 30 machines have a production capacity of 150 kg per batch, and 70 machines have a capacity of 40 kg per batch. A report from the Thai Food and Drug Administration (FDA) has shown that 77.4% of food products available on the market contain iodized salt.

Additional IDD prevention measures

The Ministry of Public Health has strongly emphasized the need to provide iodine supplements to pregnant and lactating women, to meet their higher daily requirement of 250 µg, and to ensure adequate iodine supply to the fetus and newborn infant. An oral capsule supplement (Triferdine) containing 150 µg of iodine, 400 µg of folic acid, and 60 mg of iron is produced by Government Pharmaceutical Organizations (GPOs) and covers 800,000 newborns each year.

In a number of remote areas, where access to iodized salt is limited, iodized drinking water is provided to children across 733 schools. Adding 2 drops of concentrated iodine solution to 10 L of drinking water will provide 40 µg of iodine per glass. Two to three glasses of water per day can provide enough iodine (90 to 120 µg) to meet the daily requirement of that age group.

Reaching optimal iodine nutrition

In 2014, the median urinary iodine (UIC) was 155.7 µg/L in pregnant women, 234.6 µg/L in children aged 3–5 years, and 111.3 µg/L in the elderly, which shows that all three population groups had adequate iodine intakes, and that the success of the IDD program has been maintained. Household coverage of iodized salt was 91.6%, of which 83.5% was adequately iodized (20–40 ppm). A Department of Health’s survey in January 2015 reported that the proportion of pregnant women taking iodine supplements was 94.6%, and 83.6% of the women reported taking the supplement regularly.

Raising an iodine-sufficient generation takes a village

Aware of the importance of household coverage and program sustainability, Thailand has encouraged the initiative to create “Iodine Villages”. The policy initiative came from the Public Health Minister Prof. Dr. Rajata Rajatanavin, made possible by integrating the IDD program with the Family Care Team (FCT) to create a link between the central healthcare administration and the communities. More than one million village health volunteers throughout the country have been appointed as Iodine Ambassadors. Their role includes disseminating information about the benefits of iodized salt and monitoring of household iodized salt coverage. To qualify as an iodine community, four criteria must be met: i) IDD prevention and control policies

Raising an iodine-sufficient generation is easier as part of a community

Sangsom Sinawat IGN National Coordinator for Thailand, and Saipin Chotivichien Bureau of Nutrition, Ministry of Public Health, Thailand
and measures must be in place, ii) community leaders and members must be aware of the best practices to prevent and control IDD, iii) the community must conduct surveillance of household coverage of iodized salt, and iv) pregnant women must receive iodine supplements. In 2015, data collected from 44 provinces showed that 52,171 out of 52,531 (99.3%) villages took part in the process to qualify as an iodine community. Of these, 42,665 (81.8%) villages were approved. The target is for 100% of Thai villages to become “Iodine Villages” by 2017.

In 2015, Thailand celebrates the 60th birthday of HRH Princess Maha Chakri Sirindhorn, who has been a tireless advocate for adequate nutrition. To mark this occasion, on 25–26 June this year the Ministry of Public Health held a meeting devoted to Iodine Villages across Thailand and overcoming the challenges to sustainability. In his opening speech, the Minister of Public Health discussed the policy on Sustainable Elimination of IDD. One of the invited guest speakers was Ms. Karen Codling, IGN’s Regional Co-coordinator for South-East Asia, who presented an overview of the IDD prevention and control programs and the current iodine situation across the region (see photo below). Dr. Bounthom Phengdy from the Ministry of Health, Lao PDR, with Dr. Napaphan Viriyautsahakul, Director of Bureau of Nutrition, Department of Health, Thailand, gave a speech on the “Experiences of Prevention and Control of IDD”. The meeting was an opportunity for salt producers and local health workers to exchange their experiences on quality, accessibility, and coverage of iodized salt across the country and the implementation of the Iodine Village initiative across the country.

Future plans
To ensure that the successful elimination of IDD is sustained in the future, the following steps have been proposed:

1. Set up an iodized salt monitoring system to be overseen by a National Committee, with systematic quality monitoring at the production, distribution, and household levels, and appoint the responsible Ministry.
2. Continue IDD surveillance:
   - Monitor the median urinary iodine levels in the groups at risk: pregnant women, and children aged 3–5 years. Monitor in parallel with the household coverage of iodized salt.
   - Strengthen the quality assurance system at the production level.
3. Monitor the provision of iodine supplements for pregnant women.
4. Support local administration, and community members and leaders to move towards 100% of “Iodine Villages”.
5. Build capacity of the iodized salt producers organizations.
6. Strengthen coordination of IEC activities by establishing a single database of all IDD surveillance data, including urinary iodine, salt iodine, and neonatal TSH.

Key ingredients of Thailand’s successful IDD prevention and control

- Political commitment to the sustainable elimination of IDD
- Integration of iodine supplementation for pregnant and breastfeeding women with ante-natal and well-child care
- IDD surveillance in risk groups: pregnant women, pre-school children (3–5 years old), and the elderly
- Collaboration with local administration

Constraints to overcome

- Weak enforcement of USI legislation and non-compliance by salt producers
- Presence of non-iodized salt in the market from small-scale salt producers

In celebration of Her Royal Highness Princess Maha Chakri Sirindhorn’s 60th birthday, the Department of Health awarded the Princess Health Award to five recipients, including Dr. Michael B. Zimmermann, Chair of the Iodine Global Network, for his dedication to the IDD Control Program in Thailand. Dr. Zimmermann also paid a visit to an Iodine Village community in Phetchaburi province, recognizing the inter-sectorial efforts of the local government officers to sustainably drive the elimination of IDD.
U.S. non-prescription prenatal vitamins may contain more iodine than stated on the label

Dietary supplementation is commonly recommended during pregnancy and lactation, although few reports document the extent of this practice in North America (1). These reports suggest that well over half of pregnant and breastfeeding women take a dietary supplement, and that usage is likely greater during pregnancy than lactation. Collecting intake data in this population is critical to understand the extent to which the supplements contribute to the overall nutrient intake, and help implement future recommendations.

Study overview
A study of non-prescription prenatal MVMs was conducted to estimate the relationship between label and analytical values for 21 vitamins and minerals, including iodine, in a nationally representative sample. Non-prescription prenatal MVMs were defined as products containing at least three vitamins, with or without minerals or other bioactive components, sold for prenatal use and available for purchase without a health-care provider’s prescription.

Products identified as representative of the US market were purchased from retail outlets and through direct-to-consumer sales channels. Samples of multiple lots of these products were sent to qualified laboratories for analysis of ingredients using validated methods and appropriate quality assurance measures.

The market for non-prescription prenatal MVMs is changing (and possibly growing) rapidly. To identify commonly reported and representative products for purchase, the researchers reviewed the prenatal MVM products reported by NHANES 2005–06 respondents. Additional store surveys showed that a larger variety and amount of products was available at natural-food and other specialty retailers (e.g., Whole Foods and GNC) than at mass-market retailers (e.g., CVS and Target). An evaluation of the direct sales market identified many products available online and through multilevel marketers (e.g., Amway, Melaleuca, and Herbalife). In total, multiple lots of 71 different non-prescription prenatal MVM products were purchased in 2009–2010 and analyzed in 2009–2011.

For each sample analyzed, laboratory results were compared to label levels to calculate a percent difference from the label. As shown in Table 1, for iodine, the predicted percent difference from label levels was substantially higher than the label value, and it was within a +20 to +26% range.

Practical implications of these results
These results can be used to replace information from labels to more accurately assess ingredient intakes from dietary supplements.

Future research
Additional DSID studies are underway to evaluate ingredient quantities in prescription prenatal MVMs. Future data releases will be used to monitor ingredient levels in adult MVMs over time.

References

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</tr>
<tr>
<td>Mean predicted difference from label</td>
<td>+25.9%</td>
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Poland remains iodine sufficient after 20 years of IDD prevention, but pregnant women may be at risk

Prof. Zbigniew Szybiński MD, PhD; IGN National Coordinator for Poland

After the end of the Cold War, studies conducted during 1991–1996 confirmed the presence of iodine deficiency in Poland. A Thyromobil study of schoolchildren in 1992–1993 identified a high prevalence of goiter in mountainous areas: 56.6% in the Sudeten, and 39.1% in the Southeastern region (1). Only a few years previously, a Ministry of Health program to examine the effects of the Chernobyl disaster in Poland reported a high frequency of goiter in adults. As a matter of course, the Polish Council for the Control of Iodine Deficiency Disorders (PCCIDD) was set up in 1991 to follow in the footsteps of the International Council for the Control of Iodine Deficiency Disorders (ICCIDD). A subsequent screening program reported goiter in 80% of pregnant women in the municipal area of Krakow in southern Poland (2). In 1996, under the auspices of the MoH, the PCCIDD established a National Program for the Elimination of Iodine Deficiency Disorders, to monitor iodine status and develop a mandatory model of iodine prophylaxis. Today, the program includes monitoring (goiter rates in schoolchildren and pregnant women, neonate TSH, incidence rate of thyroid cancer, prevalence of iodine-induced hyperthyroidism) as well as and an education component.

The Polish model of IDD prevention
On the Council’s recommendation, in 1996 the government mandated the iodization of household salt with potassium iodide (KI) at 30±10 mg per kg, iodization of newborn formula (at 0.10–0.15 mg KI/L) for neonates and infants who are not being breastfed. The PCCIDD also recommended voluntary supplementation of pregnant and breastfeeding women at 150–200 µg KI as oral capsules (See Box).

Polish model of IDD prevention
1. Mandatory iodization of household salt (20–40 mg of KI/kg). Since 2002, potassium iodate may also be added (10).
2. Mandatory iodization of neonate formula (10 µg of KI/100 mL).
3. Recommended additional supplementation of pregnant and breastfeeding women with 150-200 µg KI as oral capsules.
4. Dietary guidelines recommending the consumption of iodine-rich foods.
5. Education efforts (raising awareness among pregnant women, obstetricians, and endocrinologists, among other groups) (10).

To protect infants and young children against IDD, young women must be informed about the importance of iodine.
The Department of Endocrinology at the Jagiellonian University School of Medicine in Krakow is overseeing two initiatives with a goal to promote reduced salt intake. One is a multi-center government program to sustain the elimination of IDD achieved at the national level whilst promoting salt reduction (6). The other is a hospital-based program aiming to reduce salt consumption among the inpatients of the University Hospital in Kraków.

**Other sources of iodine may play a role in populations at risk**

The mandated range of iodine added to table salt was based on the current salt consumption levels in Poland, and it may no longer provide sufficient daily iodine if sodium consumption falls by more than 50% to 5 g/day. A recent collaboration with the Research Institute for Animal Production in Balice has trialled the addition of iodine to dairy cows’ mineral licks, which has increased the concentration of iodine in cow’s milk from 20–40 to 140–160 µg per liter (7). Iodine can also be found in table and mineral water with standardized concentrations of iodine (0.10–0.20 mg/L) such as the “Ustronianka z Jodem” and “Wysowianka” brands. In 2011, a new underground reservoir of iodine-rich drinking water was discovered, with iodine concentrations as high as 130 µg/dL. Technology was developed to exploit this reservoir to produce table water with 150 µg of iodide per liter, which could become an important source of additional dietary iodine for those populations who are most at risk for deficiency (school-age children, and pregnant and breastfeeding women). In 2010, a cross-sectional study of 100 pregnant women reported a median UIC of 113 µg/L, raising a concern that pregnant women in Poland may be at risk for iodine deficiency. In the same study, women who were taking iodine supplements had a significantly higher median UIC. The authors concluded that iodine supplements should be made available routinely to all Polish women during pregnancy (8). These findings are not unique in Europe, where 21 out of 31 countries with available data are currently reporting that, at a national level, pregnant women may be mildly-to-moderately iodine deficient (9).

To build on the stellar success of the national IDD prevention program and sustain the elimination of IDD for another 20 years, Poland must equip the younger generations to understand the importance of dietary iodine, and continue monitoring the effects of the IDD prevention program.

**References**


Prof. Zbigniew Szybinski, MD, PhD

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The modern history of iodine and the near eradication of cretinism

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The eradication of intellectual disability from iodine deficiency in Western countries is one of the great public health triumphs of 20th-century child health care (1). Yet the problem persists today in many parts of the world (2). This article explores why a strategy so successful in the West has proven difficult to export to certain other contexts, and how new kinds of thinking may point the way forward.

As recently as the late 19th century, American pediatricians were familiar with the dwarfism and severe mental deficiency associated with the syndrome that had long been called “cretinism”. The 1920 edition of L. Emmett Holt’s (3) influential textbook Diseases of Infancy and Childhood described these children as “dull, placid, and good-natured, rarely troublesome or excitable; and when fifteen or eighteen years old they appear like children of three or four years”. Pediatricians in those times were aware that the short stature and coarse facial features of cretinism could be lessened by the early administration of thyroid extract, with Holt describing a change in the entire appearance of the child and a loss of “the idiotic expression of the features.” However, treatment did not prevent children from developing mental deficiency.

Prenatal iodine deficiency, and the resulting fetal hypothyroidism that caused cretinism, vanished from the United States and Europe in the wake of iodization campaigns (4). To be sure, these campaigns were targeted at iodine-related goiter, but they had the effect of addressing the most common cause of cretinism as well (4, 5). Iodization in the United States was voluntary, primarily via the commercial championing of salt iodization by salt industry giants such as Morton. Other Western countries such as Switzerland attained success through government mandated prophylaxis using iodized salt. By the early 20th century, goiter and cretinism had all but disappeared from the Western world because of widespread iodine supplementation (6, 7).

Cretinism was rediscovered in resource-poor countries in the 1950s, sparking a wave of new interest that led to a different way of thinking about the disorder. Reports surfaced of endemic cretinism and goiter in a number of the more remote parts of the world, including Ecuador, China, and parts of Inner Mongolia. A large number of controlled studies were conducted during this period to elucidate the connection between cretinism and prenatal iodine deficiency. Most of the research done in the early 20th century had been focused on iodine supplementation with regard to endemic goiter and not specifically cretinism. Gradually, there was clear evidence connecting iodine deficiency to a spectrum of disorders (1, 6, 7).

“Cretinism was rediscovered in resource-poor countries in the 1950s, sparking a wave of new interest that led to a different way of thinking about the disorder.”

By the 1980s a developing awareness characterized cretinism at the extreme end of a continuum. In 1983, Australian endocrinologist Basil Hetzel (1) coined the more appropriate term iodine deficiency disorders (IDDs) to encompass all the effects of iodine deficiency, including brain damage, at a population level. Researchers recognized that iodine deficiency was a bigger public health problem than had previously been acknowledged, and they redirected policymakers to address the more demanding issue of preventing mental retardation with iodine supplementation.

For various reasons, the strategy that had worked earlier in the developed world, universal salt iodization (USI), did not readily apply in this new context. The cause of USI as the primary means of iodine delivery had been taken up by many international organizations, specifically ICCIDD and WHO. But although USI worked in areas with infrastructure, remote rural pockets were often overlooked when overall national data showed adequate consumption of iodized salt (8). Public health officers in these areas faced many challenges in supplying iodized salt, including excessive cost, lack of commercial outlets, and suspicion of interference by government authorities. These challenges were compounded by the cheap availability of non-iodized rock salt in many remote areas, such as the Xinjiang province in northwest China. Alternative emergency methods of supplying iodine, such as iodinated oil capsules or injections, were found to be expensive, labor-intensive, and difficult to sustain.

A girl from Southern Albania with moderate iodine deficiency and a visible goiter.
A pediatric neurologist from the United States, Dr Robert DeLong developed perhaps the most intriguing way to cheaply deliver iodine at a population level. During a period spanning approximately 20 years, Dr DeLong and his Chinese colleagues developed an environmental approach to iodine supplementation in primarily rural communities where iodized salt and oil had failed. For this project, carried out in southern China and Inner Mongolia, DeLong and colleagues achieved iodine supplementation by dripping an iodinated compound into the irrigation water. The intricate system of canals that was already being used by the local community became an effective means of delivering iodine to those who were otherwise hard to access. Through more than a decade of meticulous serial measurements of soluble iodine concentrations in soil, crops, livestock, and human urine specimens, DeLong demonstrated that iodine added to irrigation water persisted in the soil for >4 years and continued to provide iodine to the human population. Through evidence gathered during his years of work in China, Inner Mongolia, and subsequently Tuva, Dr DeLong became an advocate of the use of alternative cost-effective emergency methods of supplying iodine. Water has some of the advantages of salt as a vehicle for iodine fortification; as a daily necessity it reaches the most susceptible populations in isolated, far-flung areas. However, although water iodization programs are efficient and effective in controlling iodine deficiency, they are cost-effective only in smaller communities and require constant monitoring. Also, because these programs are generally more expensive than iodized salt in large-scale national programs, they are less likely to be self-sustaining in poor rural countries. Therefore, this method is meant to be used primarily as an interim solution while laying groundwork for the more long-term, more internationally accepted supplementation via iodized salt.

Cretinism still exists in remote rural areas of many countries with an estimated 2 million children affected globally every year. Although USI is the primary tool being used for iodine supplementation internationally, it is important to think of alternative interim methods while the infrastructure needed to effectively deploy USI is put into place. More than a century after Holt described cretinism, the iodine movement has continued to gain worldwide momentum and has been perhaps one of the greatest developmental public health breakthroughs. The story of the 20th-century movement to eradicate cretinism illustrates a key point about global preventive health: Creative thinking is pivotal in bringing about change, and locally appropriate strategies are important.

References

Unlike in most other countries, where dietary iodine comes from bread, dairy products, fish, and iodized salt, in Japan the primary source of iodine is seaweed. Nori (Porphyra), Wakame (Undaria) and Kombu (Laminaria) are the most popular seaweed products in the country. The highest iodine content (approximately 2,400 µg/g) is found in Kombu, edible kelp, which is consumed widely throughout East Asia. Kombu extract is often an ingredient of pre-packaged processed foods; however, the iodine it provides is often not listed on the label.

Japan is a country of long-standing iodine sufficiency, and the issue of iodine nutrition has not been on the forefront of the public health agenda. Prior to 1999 iodine was not even included in the government’s dietary reference intake tables (1), and it took until 2010 for iodine content in foods to be reported in the standard composition tables (2). Because there is no national surveillance system to monitor iodine intakes, recent data on the population’s iodine status is lacking.

‘Endemic coast goiter’ and iodine nutrition

The misconception that most Japanese consume too much iodine may have its roots in several early studies in the coastal area of Hokkaido. In 1933, Jesse F McClendon of the University of Minnesota reported that Japan was the only non-goitrous country in the world, with one case of goiter per million people (3). The northern island of Hokkaido was an apparent exception, where cases of endemic goiter could be traced back to 1899 (4). But when later surveys, conducted between 1948 and 1952, reported goiter throughout Japan (with goiter rates in children ranging from 0.9% to 20.6% across 11 of 46 prefectures), they went largely unnoticed by the international scientific community.

The first large epidemiological study in Japan was conducted in 1960–1964 in three goitrous regions on the coast of Hokkaido (Hidaka District, and Rebun and Rishiri Islands), and it was published in English (5). A total of 8,074 children aged 6–17 were enrolled, and 3,400 children in Sapporo city were recruited as control. The prevalence of obvious goiter was 6.6% in Hidaka, 9.0% in Rebun, and 2.6% in Rishiri, all of which were significantly higher than in the Sapporo children (1.3%). The highest prevalence (24.2%) was observed in a seaweed fishing village on Rishiri Island, in the absence of any well-known goitrogens. Other features observed in the study included a lack of clinical hyper- or hypothyroidism among the children with goiter, and a high daily consumption of Kombu (10–20 g/day) combined with very high urinary iodine excretion (mean UIE = 23.3 mg/day). Based on their findings, the authors concluded that longstanding excessive intake of dietary iodine was the most likely cause of goiter in Japan. The name "endemic coast goiter" was coined, even though it was generally accepted that the biggest factor in the development of endemic goiter around the world was iodine deficiency. After repeating the survey five years later in a larger area of Hokkaido, the authors found the same close relationship between goiter rates and seaweed. Their reports had a major impact on the international goiter research community.

It wasn’t until another large study was conducted in 1972–1975 that the concept of seaweed-induced goiter could be called into question. A comparison of 10,220 school-children from urban (Kanazawa City) and seaside (Wajima City) areas found no significant difference in the prevalence of goiter (2.7 vs. 3.0%). But this was the last reported goiter survey in Japan, and its findings cannot be compared with more recent data.
Did excessive iodine intake contribute to thyroid dysfunction?
Since 1978 there have been several case reports linking thyroid dysfunction with dietary iodine. They included cases of Hashimoto’s thyroiditis induced by ingesting large amounts of seaweed, reversible hypothyroidism after restriction of iodine-rich foods, hypothyroidism in anorexic patients consuming 50–100 g of Kombu daily, and transient hypothyroidism or persistent hyperthyrotropinemia in infants due to a high maternal intake of iodine-rich foods during pregnancy. In 1992 a survey in 1,061 adults from five coastal areas of Hokkaido measured serum TSH and urinary iodine concentrations (UICs) (6). The mean urinary iodine measured by an iodide-selective electrode was 3,300 μg/L (27.1 μmol/L) in 4,138 healthy adults in Sapporo. In addition, kelp-induced goiter had disappeared, but high UI concentrations correlated with non-autoimmune hypothyroidism. On balance, the authors concluded that, in addition to chronic thyroiditis, excessive iodine was a possible cause of hypothyroidism in this iodine-sufficient area. Interestingly, subsequent UI studies in adults reported concentrations in the range of 213–241 μg/L, and the reason for the extremely high urinary iodine in the Sapporo study is unclear.

Recent epidemiological studies
More epidemiological studies of iodine nutrition were conducted between 2002 and 2011 in approximately 3,000 individuals from different age groups in metropolitan areas including Tokyo, Chiba, and Kanagawa prefectures (Table 1). The median UIC ranged from 109 to 282 μg/L indicating that iodine intake was not excessive according to the WHO criteria. At the same time, the median UIC in breastfeeding women was relatively low (116 and 136 μg/L), although still sufficient.

Current data on iodine intake in Japan
According to the latest Iodine Global Scorecard, the median UIC in Japan is 287 μg/L, which has been derived from subnational studies conducted in 2002 in 6–12 year-old schoolchildren from Tokyo, Ashikawa, and Nakashibetsu, Hokkaido (7, 8). Although the distance between Tokyo and Ashikawa is around 580 miles, their median UICs were very similar (281.6 and 288.0 μg/L, respectively). And despite this fairly high urinary iodine excretion, the thyroid volume in Tokyo was found to be lower than in other iodine-sufficient areas around the world. In Nakashibetsu, the median UI was clearly in the excessive range (728 μg/L), and the mean thyroid volume was approximately twice that reported in other countries (9). Nakashibetsu is a dairy farming town with a population of 24,000 in an inland area, and the reason for the high median UIC and large thyroid volume is unclear.

<table>
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<th>Population</th>
<th>Age</th>
<th>Median UIC (μg/L)</th>
<th>Median daily iodine intake (μg/day)</th>
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<td>Term newborns (days)</td>
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<td>109</td>
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<td>4</td>
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<td>32.1</td>
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In 2013 began the first nationwide school-based survey of iodine nutrition. It will measure UICs in 6–12 year-old children and iodine intake in their guardians using an iodine-specific food frequency questionnaire. So far approximately 6,000 children and 7,500 guardians from 12 schools in 7 prefectures have been enrolled. At present, the overall median UIC is 290 µg/L suggesting iodine sufficiency. But across the prefectures, the median UICs vary from 221 to more than 1000 µg/L in Hiroshima and Nakashibetsu, Hokkaido (Figure 2). Moreover, 26% of the 12 year-olds and 31% of the 6–11 year-olds have urinary iodine concentrations exceeding the national age-specific tolerable upper limit of iodine (Table 2).

On balance, it is not clear at present that the iodine intake in Japan is excessive, although the daily consumption of iodine is higher than in most other countries. Future epidemiological studies in Japan should continue investigating the role of iodine in thyroid dysfunction.

### TABLE 2  Tolerable upper limits of iodine (µg/day)

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<td>600</td>
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</table>

*Zimmermann 2009 (See Ref. 10)

On balance, it is not clear at present that the iodine intake in Japan is excessive, although the daily consumption of iodine is higher than in most other countries. Future epidemiological studies in Japan should continue investigating the role of iodine in thyroid dysfunction.

### References
Tajikistan scales-up efforts to tackle iodine deficiency

Greg S. Garrett and Mutriba Latypova Global Alliance for Improved Nutrition

In July 2015, the Ministry of Health and Social Protection of Tajikistan, GAIN, USAID and UNICEF co-convened a national two-day roundtable entitled, “Food Fortification: From Policy to Health Impact.” This event advanced ongoing fortification and iodization efforts by providing an overview of the successes and challenges in the USI programme and some proposed solutions. The roundtable culminated in the signing of the Dushanbe Declaration on Food Fortification and Salt Iodization by the Ministry of Health. This is a key milestone in the maturation of the Tajikistan universal salt iodization (USI) programme.

Despite improvements over the past 20 years, the 2009 National Micronutrient Nutrition Survey found that iodine deficiency still affects more than 58% of women and approximately 53% of children in Tajikistan. Regional variations range from 73% in the southern districts to less than one percent in a handful of northern areas. Some of the reasons which have contributed to this apparent lack of progress include 1) sub-optimal regulatory enforcement and industry compliance; 2) ineffective potassium iodate (KIO3) procurement and distribution mechanisms; and 3) demand activities not appropriately harmonized with the supply side.

Since 2012, GAIN and partners have been working to address these issues systematically through a project with three key components thanks to funding from USAID. First, the project has provided training on good practice in quality assurance and quality control (QA/QC), and regulatory monitoring with industry and government food control. Second, GAIN has helped salt producers procure KIO3 through a pooled approach, which led to a decrease in price by over 50%. Third, working closely with UNICEF, GAIN has helped to improve community and retail involvement in USI in Khatlon Province through a market-based approach using Rapid Test Kits (RTK).

For this last component, GAIN, UNICEF and local partners adapted a model used successfully in Kyrgyzstan to improve access to adequately iodized salt among communities (1). GAIN and UNICEF ensured widespread distribution of iodine RTKs in markets and throughout communities to enable consumers and traders to differentiate between iodized and non-iodized salt.

The project has accomplished the following to date:

- A comprehensive salt situation analysis identifying bottlenecks in USI legislation and regulations, salt processing challenges, iodized salt availability, and consumer and distributor awareness
- A baseline household survey. Preliminary results show that only 26% of households are using adequately (>15 ppm) iodized salt. Poor level of iodine (<15 ppm) was observed in 43% samples, and almost one third (31%) of the samples had no iodine at all.
- Improved capacity among 60 lab workers of salt companies, representatives of inspection agencies on QA/QC through training
  - Trained village heads and local self-government (jamoat) in 26 districts.
  - Introduced RTK strategy with 14’000 test kits and 2’000 copies of the RT law distributed among communities and retailers.
  - Provided 12 sets of lab equipment for titration to salt producers and inspection agencies.
  - Trained more than 100 district-level primary health care workers of Khatlon on generating community awareness about salt iodization and IDD.
  - Distributed 38,500 test kits among government agencies, village and community heads, shop owners, primary health care workers and households.
  - An endline survey was conducted recently covering 600 households in 24 districts of Khatlon Province. Overall, the RTK strategy improved knowledge and increased the demand for iodized salt.

Following the national roundtable in July and the Government’s Declaration among 80 leading policymakers, industry representatives, national and international partners, and international food fortification experts, GAIN and partners are committed to working with government and the private sector to help Tajikistan reduce its high levels of iodine deficiency.

We are looking forward to continuing the iodization dialogue with delegates from Tajikistan and over 25 countries at the first ever Global Summit on Food Fortification in Tanzania from 9-11 September 2015 (#FutureFortified).

References
Cambodia’s IDD program jeopardized by poorly iodized salt

Iodine deficiency disorders have long been recognized as a significant public health issue in Cambodia. In the late 1990s, a national survey showed that 17% of primary school children were affected by goiter (1). In 1996, the Royal Government of Cambodia established the National Sub-Committee for the Control of IDD (NSCIDD), and Universal Salt Iodization has been the primary intervention to improve the population’s iodine status.

Introducing iodized salt
Salt is one of the main condiments used in Cambodia. The average consumption per capita is 15 g/day, which includes salt in fish sauce, pickles, and other processed foods. Roughly 85% of the salt is produced in Cambodia, mostly in solar plants by salt producers’ communities of Kampot and Kep. Solar evaporation forms “coarse salt,” i.e., large salt crystals with a diameter of 0.5–1 mm. It is either sold as-is, or it passes through refineries where it is boiled into shallow-well reservoirs to a finer grain. Coarse salt is iodized with potassium iodate by spraying while fine salt by a dry mixing method.

Iodized salt production in Cambodia began in 1999, but due to a lack of mandatory legislation and the production being spread across many small-to-medium plants, by 2000 the household coverage was only 13% (2). Lessons were learned, and mandatory legislation followed in 2003. Subsequently, the number of Cambodian households using iodized salt grew from 28% in 2004 to 70% in 2011 (3). Between 2004 and 2008, the median urinary iodine concentration among Cambodian school-children remained adequate at 236 μg/L. But at the same time, the proportion of very high UI concentrations (above 500 μg/L) rose from 5.5% to 16.0%. Whether they were consuming too much salt or taking in iodine from other dietary sources is unclear.

In 2010, the Cambodian government and salt producers became responsible for the supply of potassium iodate, to ensure long-term sustainability of the iodization program. The recent Cambodian National Food Security and Nutrition Strategy (4) highlighted the importance of continuing a fortification program and of strengthening the quality control of fortified products.

Assessing compliance with salt iodization legislation
To assess the salt producers’ compliance with the law over the past 6 years, the authors took data from three recent salt surveys. Two surveys, conducted in 2008–2011, analyzed household salt from over 4600 schoolchildren aged 8 to 10 years in urban and rural areas across all 24 provinces. A third survey, conducted in 2014, analyzed 1862 salt samples available on the market. All three studies used the same methodology and equipment (a WYD iodine checker).
The analysis showed that the iodine levels in household salt did not change between 2008 and 2011, at 18.0 mg/kg in 2008 and 22.0 mg/kg in 2011. But by 2014, the median iodine content had dropped significantly to 0.0 mg/kg (IQR, 0.0–8.9 mg/kg) (p<0.001). In addition, the proportion of salt without any iodine increased from 1.3% in 2008 to 21% in 2011, and finally to 62.2% in 2014 (both p<0.001) (Figure 1).

According to the 2014 data, the prevalence of non-iodized salt (coarse and fine) varied significantly between provinces (p<0.001) (Figure 2). Surprisingly, the proportion of non-iodized salt on the market was high also in the salt-producing provinces of Kep and Kampot, which may be due to leakage of non-iodized salt from production areas. According to international food fortification guidelines, at least 80% of individual samples should meet the legal minimum level of iodization. If the minimum is not met, a warning should be issued, and more frequent inspection should be planned at the production site and at retail level.

**Consequences of non-iodization**

The dramatic rise in the prevalence of non-iodized salt in Cambodia demonstrates that the national iodization program is still fragile in the absence of help from development partners. The findings of this study contradict the results of internal monitoring performed by the local producers, who have consistently reported that in 2008–2014 (unpublished) more than 90% of 27,000 salt samples contained 20–60 mg/kg of iodine. The lack of external quality control since the last national survey is of great concern and could threaten the program’s sustainability.

The presence of non-iodized salt also raises a question about the possible impact of Vietnamese and Thai imported salt on Cambodia. The price variance between Cambodian domestic salt (US$65 per metric ton) and Vietnamese salt (US$30–$40 per metric ton) encourages the influx of non-iodized salt across the border, aided by a lack of border controls and import monitoring. Vietnam stopped iodizing salt after the 2005 revised decree on the production of iodized salt failed to uphold the mandatory iodization requirement in Vietnam (5).

The current mandated iodization range (30–59.9 mg/kg) in Cambodia could be seen as a burden for the salt industry due to the cost implication and the lack of import controls. If the program was appropriately implemented, with average iodization at 30 mg/kg, the consumption of 10–15 g of salt (i.e., actual Khmer consumption) would provide 300–450 µg of iodine per person per day. Therefore, by reducing the standard to 15–30 mg/kg, the Cambodian Government could pave the way for better compliance from the salt producers and still meet the recommended intake of 150 µg/day. Given the upcoming ASEAN free trade agreements, any updates to the standards should take into consideration the iodization levels in the neighboring countries.

The low coverage of iodized salt will definitely have an impact on the iodine status of the Cambodian population. A recent study, conducted in June 2014 (unpublished data), found that the median UIC among 2300 schoolchildren in Kampong Speu has declined to 167 µg/L from the previous median of 236 µg/L in 2008.

In conclusion, the authors recommend to implement the following eight interventions:

1. Test the stability of iodine in different settings (production/market/household).
2. Assess the impact of low iodization on the population iodine status.
3. Assess the bottlenecks encountered by the salt producers.
4. Develop a monitoring system together with the Food Administration Authority to ensure that domestic and imported salt is iodized.
5. Allocate a national budget to the enforcement of the legislation.
6. Develop regional standards and regulations for iodized salt including penalties.
7. Ensure that fortification standards, including iodization, are integrated with industry licensing and registration.
8. Sensitize the population to fake labeling.

### Poorly iodized salt may put women and young children at risk for iodine deficiency in Cambodia.

### Conclusions and recommendations

Due to a lack of regular monitoring and enforcement from government agencies, salt iodization in Cambodia has gone from being well implemented to marginal within less than a decade. But the enactment of mandatory legislation is not sufficient on its own to ensure program sustainability, especially in the absence of funding from development partners. To ensure that iodine deficiency disorders do not re-emerge, Cambodia must implement a well-designed monitoring system for quality control and assurance.

### References

3. Conklin, J et al. Cambodia children have ample iodine intake but only 70% of households are covered by iodized salt. IDD News. 2013, 41, 4–7.
Ensuring that iodine-fortified salt reaches every pregnant woman and infant—the primary target group in the population, is a challenging task. Many stakeholders are involved in the production of raw salt, iodization, transportation, distribution, wholesale trading, retailing, and purchase before iodized salt can reach the household. Each of these stakeholders must function optimally to ensure that adequately iodized salt reaches the target consumers. IDD control initiatives at a global and national level have long been recognised as multi-sectoral initiatives. For any public health program’s success, consensus is required amongst all stakeholders to move together, forward, and faster.

India has had a national IDD control program in place since 1962 and adopted a USI strategy to combat IDD in 1983. The National IDD Control Programme (NIDDCP) is a centrally-funded program which identifies USI as the primary strategy to eliminate IDD as a public health problem in the country. The identified objectives of the NIDDC program are (i) to conduct surveys, (ii) to assess the magnitude of IDD, (iii) to supply iodized salt in place of common salt, (iv) to re-survey after every 5 years to assess the extent of IDD and the impact of iodized salt, (v) laboratory monitoring of iodized salt and urinary iodine excretion, and (vi) health education and advocacy.

USI achievements
The USI program has been one of the few public health success stories in India. The policy decision to iodize all edible salt in India was introduced in 1984 and phased in from 1986. Since then, the household coverage of adequately iodized salt has gradually increased, from 49% in 1992 to the current level of 71% (1). Another 20% of households consume salt with some iodine, and only 9% of households consume salt with no iodine. The production of iodized salt has increased from two hundred thousand metric tons (MT) per year in the 1980s to the current 6.2 million MT in 2011–12, well in excess of the national requirement of 5.8 million MT per year. However, significant differentials in household coverage occur across different regions of India (83.2% in urban and 66.1% in rural areas; coverage below 40% in Chhattisgarh and Karnataka, and more than 97% in the states of Manipur, Meghalaya, and Nagaland) and across socio-economic strata. Marginalized or hard-to-reach populations and vulnerable age groups (young children and pregnant women) most at risk of iodine deficiency are yet to be universally covered with adequately iodized salt.

Ten years of a successful national coalition in India
Recognizing the importance of a formal mechanism for coordinating and synergizing the activities of all stakeholders, WHO/UNICEF/IGN prescribed a national multi-sectoral coalition as one of ten key factors necessary to achieve sustainable elimination of IDD. The coalition should be responsible to the government for the national IDD program and should represent all concerned sectors, including the salt industry, each with defined roles and responsibilities. The coalition should not only act as a forum for collective advocacy for the promotion of USI at national level but also provide a platform for dialogue between the partners to iron out the differences, identify common ground, and synergize and coordinate activities of all stakeholders.

The activities of the national coalition in India can be broadly classified into three distinct phases, each with characteristic challenges and contributions.
**Phase 1: Inception (2006 to 2009)**

The National Coalition for Sustained Optimal Iodine Intake (NSOI) was officially launched in April, 2006, during a Board meeting of the IGN (then ICCIDD) held in New Delhi. Its proposed activities were: i) to hold regular consultation meetings of partners/stakeholders to identify actionable key interventions to strengthen USI; ii) to share information and advise relevant institutions and sectors on how to strengthen USI; iii) to act as a repository of national and international experiences and resource materials pertaining to IDD and USI; iv) to advocate with policy makers and program implementing agencies; and v) to implement chosen interventions with the help of partners/stakeholders.

Many attempts were made during these initial years to convince the Government of India to assume leadership of the coalition, but they were unsuccessful. As a result, the ICCIDD Regional Office, with support from partner agencies, continued to function as an unofficial secretariat of the coalition, coordinating the activities of all USI stakeholders, which led to synergies among partner agencies.

**Phase 2: Consolidation (2009–2012)**

In early 2009, it was decided to establish a new secretariat, led by one of the partner agencies. The Regional Office (South Asia) of ICCIDD at the All India Institute of Medical Sciences (AIIMS) was elected as the new host. By virtue of their association with pioneering research, their institutional legacy, and mentorship, they were obvious candidates. UNICEF and GAIN acted as a catalyst for the formation of the secretariat and, along with ICCIDD, provided the initial funding. Soon followed financial support from other partners, including the Micronutrient Initiative.

The first challenge tackled by the coalition was getting the Ministry of Health and Family Welfare on board, initially by inviting the Nutrition Advisor to coalition meetings, and eventually by ensuring that the work plans of all partners would be submitted to the Advisor. Since its formation in 2009, the coalition convened fourteen successful meetings. The platform was used to undertake many joint programs and projects, which often exceeded the resources and capacity of any individual agency. Two of the most challenging activities accomplished by the coalition included leading a national multi-sectoral workshop on IDD, and establishing a management information system (MIS) at the Salt Commissioner’s Office.

**Phase 3: Expansion (2013 until present)**

Inspired by its successes, the coalition was invited to share its experiences with Bangladesh and Sri Lanka, where plans are in place to establish a similar national level coalition for USI. In India, plans are afoot to establish state-level coalitions, which would include state-level stakeholders and maintain strong linkages to the national level coalition in order to enable bi-directional learning and exchange of ideas. It is clear that to reach the proverbial “last mile” in India’s journey towards 90% household coverage of iodized salt, it is essential to address the socioeconomic and interstate inequities. Initially, the salt producing states of Gujarat, Rajasthan, and Tamil Nadu along with two high burden states of Bihar and Uttar Pradesh, were identified for establishing state coalitions in 2013–14. In consultation with other partners, the coalition planned a series of advocacy activities and meetings in these five states.

**Strengths and limitations of the national coalition**

**Strengths**

- Sensitive tasks that individual stakeholders may not be able to take up individually can be pursued from a collective platform, thus minimizing the risks and optimizing the expected gains.
- Inspired by this success, other nutrition and micronutrient programs, including flour fortification, are on the way to establish national coalitions.

**Limitations**

- Lack of sustainable funding for the secretariat
- Absence of rotation within the secretariat amongst partner agencies
- Failure to convince the ministry of Health and Family Welfare to assume a leadership role in the coalition.

**Discussion**

The national coalition has been instrumental in ensuring greater coordination and synergy amongst IDD and USI stakeholders in India. In a short time span of 7 years India has achieved a 20 percentage point increase in household coverage of iodized salt. In the next phase, the coalition should address the issue of equity, with more focus on high-risk groups and hard-to-reach populations in high-burden states.

The next major challenge will be to generate a consensus and mobilize resources to conduct national and state IDD surveys in order to monitor iodine status. The district-specific IDD survey guidelines of the National IDD Control Program are obsolete and need to be revised to strengthen monitoring. This may be possible by adopting the innovative “Future Search” methodology, previously used with success in South-East Asia. “Future Search” involves a task-focused planning meeting that helps people transform their capability for action quickly (2). The tasks include: i) reviewing past IDD elimination efforts, ii) building a composite picture of everything that is happening in the present that is external, and that will have an impact on future IDD situation, iii) developing one or more future scenarios for the elimination of IDD 5–20 years into the future, iv) finding common ground amongst the scenarios, v) creating action plans for both the short and the long term for sustaining the elimination of IDD. This “mission approach” has to be adopted by the government at the highest political level, and it should have clearly defined objectives and strategies. Fast-track procedures and collective action by an inter-sectoral effort are integral components. Close monitoring and transparent evaluation should be developed in line with the goal, objectives and strategies of the approach.

**References**


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**Reaching marginalized populations and vulnerable age groups will be the next challenge for the national coalition.**
In the final year of the 14-country, seven-year GAIN-UNICEF USI Partnership Project, GAIN, UNICEF and partners have conducted national household iodized salt coverage surveys in most countries. In some of the countries, data on iodine status was collected as well. The results of these surveys should provide a much needed update for many countries which are still scaling up their salt iodization efforts, and they will inform national iodine strategies moving forward.

Survey design, indicators, and countries

Information on both household coverage and iodine status was collected as part of national nutrition surveys or iodine monitoring systems in the following six countries, mostly with some support through the Partnership: China, Ethiopia, Indonesia, Niger, Pakistan, and the Philippines. Stand-alone iodine surveys have been conducted over the past 12 months in 5 countries: Bangladesh (household and retailer salt iodine), Egypt (household salt iodine and urinary iodine among school-age children and pregnant women), and in India, Ghana, and Senegal (household salt iodine and urinary iodine among women of reproductive age). These surveys have been led by GAIN with additional technical and funding support from UNICEF and a range of national and international partners (e.g. the Micronutrient Initiative in Senegal).

Survey design was based on recommendations from national partners (Government and supporting agencies), with stratification according to programmatical useful domains, e.g., salt producing areas were included as a stratum in Senegal and Ghana to assess the factors associated with the lower household salt iodine typically found in these areas.

The field work was carried out by experienced national implementing partners. Household interviews consisted of modules to assess respondent awareness and knowledge of iodine deficiency and iodized salt, along with typical salt buying practices and the frequency of consumption of popular condiments/foods (potential sources of iodized salt). In addition, modules were included to generate data to compile the multidimensional poverty index (MPI) (1) in order to later analyze access to adequately iodized salt according to vulnerability to poverty. The MPI is a composite index comprising indicators under three distinct domains: health, education, and living standards.

Salt and (where applicable) urine samples were collected from all eligible households and analysed quantitatively at national laboratories, all of which participated in an External Quality Assurance system established by GAIN specifically to support these surveys.

Three of the surveys were conducted using mobile phone-based tools, which allowed for the use of automatic skips, in-built checks and warnings of unusual data entry, etc. while at the household. Data from all team members were uploaded to a server at the end of each day, or whenever connection was possible, and monitored for consistency, potential errors, and response rates on an ongoing basis.

A summary of data collection status, highlighting any unexpected findings, was shared with the national implementing partners three times a week to provide the opportunity for timely follow-up.

Next steps

Data analyses are nearly complete for all five countries that conducted the stand-alone surveys, and a series of data review meetings with national partners are being held to determine the key findings and recommendations for the survey report as well as for further dissemination. Depending on the survey outcomes and national context, national data dissemination events and/or strategy review workshops will take place in each of these countries before the end of 2015, to sensitize national stakeholders about successes that need to be sustained and about gaps where additional efforts may be required to reach optimal iodine nutrition.

Publication of key cross-country findings is being co-ordinated through the GAIN-UNICEF Partnership along with support for additional nationally-led investigations to draw out any potential research messages, and to position the information in the context of the national programmes.

References

Successful advocacy meeting on USI opens door to progress in Sudan

A high-level policy advocacy meeting on universal salt iodization and IDD prevention strategies was held in Sudan on 26 July, 2015. Led by the Iodine Global Network’s Regional Coordinator for the MENA Region, Dr. Izzeldin Hussein, the meeting focused on the policy environment, national ownership and program governance, as well as communication and M&E and QA/QC. To date only 10 of the country’s 18 states have passed laws banning the sale of non-iodized salt, leaving room for continued efforts in this area.

The comprehensive meeting involved all partners in progress, including MoH representatives responsible for nutrition and mother&child health, Ministry of Industry representatives, salt producers, IDD program managers, legislators and policy makers, as well as agencies including WFP, WHO and other partners. The meeting successfully defined the roles of various partners, and it secured political commitment to iodized salt legislation and enforcement, with active involvement from investors and salt producers.

Source: Project Healthy Children (www.projecthealthychildren.org); 27 August 2015

Burundi signs food fortification decree

Burundi’s program took an enormous step forward with the signing of the Presidential Fortification Decree! As of March 2016, after the established grace period, fortification will be mandatory for all importers and domestic producers. And premix has been declared VAT free, significantly reducing the price of fortification for producers. These achievements will make an enormous impact on the lives of millions of women and children throughout the country.

The fortification decree applies to wheat, cassava, maize flour, cooking oil, and salt.

Over the next several months, PHC will work closely with the Bureau of Standards to ensure inspectors adhere to the required sampling and testing plan, results are reported back to stakeholders using Burundi’s Fortification Monitoring Tool, and industry will be provided with further technical assistance. The coming weeks will see the decree printed in three national newspapers for public announcement.

Despite ongoing political turmoil, strong leadership and committed industry did not let the situation thwart the efforts to make fortification a reality. If progress continues at this pace, the program will be on track to ensure all industry is producing adequately fortified food by the end of 2016.

IGN Regional Sustainability Workshop announced in Central Asia

A UNICEF-IGN Regional Workshop on Sustainable Prevention of Iodine Deficiency and Achievement of Optimal Iodine Nutrition will be held in Almaty, Kazakhstan, on 24–25 September this year. It will be attended by representatives from Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan, and Uzbekistan. A second regional workshop for the remaining countries in the CEE/CIS Region is in preparation.

‘Future Fortified’ Global Summit in Arusha, Tanzania, 9–11 September

#FutureFortified is a unique three-day global summit as part of international efforts to reignite interest, awareness, and investment in food fortification. Hosted by the Global Alliance of Improved Nutrition (GAIN) and the Government of Tanzania, in partnership with the Bill and Melinda Gates Foundation, USAID, UNICEF, the World Food Programme, the African Union, and Scaling-Up Nutrition, the Summit will bring together experts from across a range of disciplines and include governments, academics, technical supporters, donors and beneficiaries. The goal of the Summit is to forge a vision and strategy for fortification to contribute to the Sustainable Development Goals and beyond.

For more information visit the Devex platform: https://pages.devex.com/future-fortified.html; or follow the Summit on Twitter with #FutureFortified
IGN Satellite Meeting at the International Thyroid Congress

The 15th International Thyroid Congress (ITC) will be held on 18–23 October this year in Orlando, USA. Hosted by the American Thyroid Association (ATA), the ITC will bring together the international community of endocrine specialists and other health professionals to present the latest developments in thyroidology. On 18th October, the Iodine Global Network will hold a Satellite Meeting to discuss the latest developments in global IDD efforts. The Satellite Meeting program is available on the ATA website, and registration is now open: www.itc2015.thyroid.org

Symposium on salt fortification in the Americas

The 17th Latin American Congress of Nutrition (SLAN) will take place in Punta Cana, Dominican Republic, on 8–12 November 2015. On the last day, a special symposium will be devoted to “Fortification of salt with micronutrients within the framework of salt reduction strategies.” Eduardo Pretell, IGN Regional Coordinator for the Americas, will present an overview of the current situation of salt iodization programs across the American Region. Other topics addressed by the symposium will include fortification of salt with micronutrients other than iodine, the use of scientific evidence to develop global fortification guidelines, and the achievements and challenges of salt reduction strategies across Latin America. A detailed program is available on the website: www.slan2015.com

‘EUThyroid’ initiative to kick off in Vienna

The pan-European research initiative within the EU funding scheme Horizon 2020, called ‘EUThyroid’ will kick off in Vienna, Austria, on 7–9th September. The goal of the meeting will be to discuss the functions and responsibilities of the individual project teams and their leaders, and how each work package will be implemented. ‘EUThyroid’ includes teams from 32 countries and will focus on standardization of iodine monitoring across Europe, with emphasis on pregnant women as well as the health economics of iodine-related thyroid disease across the continent. As one of the project’s collaborators, the IGN will disseminate the outcomes and update the evidence base for establishing recommendations on IDD monitoring.

IGN mourns the loss of Founding Member and former Chair, John B. Stanbury (1915-2015)

On July 6, 2015, the iodine community lost a pioneer in iodine research and a mentor to a generation of thyroid scientists, Dr. John B. Stanbury. Dr. Stanbury attended college at Duke University and medical school at Harvard. He led the Thyroid Unit at Massachusetts General Hospital from 1949–1966, then became a Professor in the Department of Nutrition and Food Science at the Massachusetts Institute of Technology. His studies were the first to demonstrate the association between dietary iodine deficiency and intellectual disability and neurological deficits. Recognizing the need for governmental intervention to solve this problem, he went on to become a world advocate for the addition of iodine to salt in countries with inadequate dietary iodine. He was an organizer of the inaugural meeting of ICCIDD in Kathmandu in 1986, and the first chair of ICCIDD. He was also a mentor to a generation of thyroid scientists. Over the course of his career he was the recipient of multiple awards, including the Prince Mahidol Award from the royal family of Thailand, the Farney Medal of the Franklin Institute, and honorary degrees from Leiden University and the University of Pisa. He passed away on July 6, 2015 at the age of 100.
Serum thyroglobulin before and after iodization of salt - An 11-year DanThyr follow-up study
This study’s objective was to investigate individual serum thyroglobulin (Tg) changes in relation to iodine fortification (IF) and to clarify possible predictors of these changes. The authors performed a longitudinal population-based study (DanThyr) in two regions with different iodine intakes at baseline: Aalborg (moderate iodine deficiency (ID)) and Copenhagen (mild ID). Participants were examined at baseline (1997) before the mandatory IF of salt (2000) and again at follow-up (2008) after IF. The authors examined 2,465 adults and a total of 1,417 participants with no previous thyroid disease and without Tg-autoantibodies. Overall, the follow-up period saw no change in median Tg in Copenhagen (9.1/9.1 µg/L) while Tg decreased significantly in Aalborg (11.4/9.0 µg/L, p<0.001). Regional differences were evident before IF (Copenhagen/Aalborg, 9.1/11.4 µg/L, p<0.001), whereas no differences existed after IF (9.1/9.0 µg/L). The authors concluded that after IF there was a decrease in median Tg in Aalborg, and the previously observed regional differences between Aalborg and Copenhagen had leveled out.

The new emergence of iodine deficiency in the UK: consequences for child neurodevelopment
The United Kingdom is now classified as mildly iodine deficient by the World Health Organization, based on a 2011 national study of 14-15-year-old schoolgirls. As pregnancy is the most critical time for brain development, the authors evaluated iodine status in pregnant women in Surrey (n = 100) and Oxford (n = 230). The median urinary iodine concentration was 85.3 µg/L in Surrey women, considerably lower than the WHO cut-off of 150 µg/L. Oxford women had similarly low status. The authors investigated whether level of iodine deficiency was associated with adverse child cognitive effects using stored samples and data from the Avon Longitudinal Study of Parents and Children cohort. In adjusted analyses, they found a significant association between low maternal iodine status in early pregnancy (urinary iodine-to-creatinine ratio <150 µg/g) such that children had an approximately 60% greater risk of being in the bottom quintile of scores for verbal intelligence quotient, reading accuracy and comprehension. UK women who might become pregnant should ensure they have adequate iodine status to avoid compromising their children’s brain development.

Marginal iodine status and high rate of subclinical hypothyroidism in Washington DC women planning conception
Thyroid function tests, thyroid antibodies, and urine iodine levels were evaluated in women presenting for preconception screening and counseling. One hundred and forty one women enrolled in the study. The median TSH level was 1.70 mIU/L (range 0.43–5.3 mIU/L). Seventeen women (11%) had a TSH above the upper limit of normal (>3.0 mIU/L). Eleven women (8%) were positive for TPO-Ab and 21 women (15%) for Tg-Ab. The median urinary iodine concentration was 100.5 µg/L (range 9–843 µg/L). The authors concluded that this cohort exhibited the lowest median urinary iodine concentration levels to date reported in the United States for women in their childbearing years. One out of every nine women (11%) had thyroid function tests consistent with subclinical hypothyroidism.
Stagnaro-Green A et al. Thyroid. 2015 Aug 7. [Epub ahead of print]

Iodine intake as a risk factor for thyroid cancer: a comprehensive review of animal and human studies
Thyroid cancer (TC) is the most common endocrine malignancy and in most countries, incidence rates are increasing. Although differences in population iodide intake are a determinant of benign thyroid disorders, the role of iodine intake in TC remains uncertain. The authors review the evidence linking iodine intake and TC from animal studies, ecological studies of iodine intake and differentiated and undifferentiated TC, iodine intake and mortality from TC and occult TC at autopsy, as well as the case-control and cohort studies of TC and intake of seafood and milk products. They perform a new meta-analysis of pooled measures of effect from case-control studies of total iodide intake and differentiated TC, iodine intake and mortality from TC and occult TC at autopsy, as well as the case-control and cohort studies of TC and intake of seafood and milk products. They perform a new meta-analysis of pooled measures of effect from case-control studies of total iodide intake and TC. Finally, they examine the post-Chernobyl studies linking iodine intake and risk of TC after radiation exposure. The available evidence suggests iodine deficiency is a risk factor for TC, particularly for follicular TC and possibly, for anaplastic TC. This conclusion is based on: a) consistent data showing an increase in TC (mainly follicular) in iodine deficient animal models; b) a plausible mechanism (chronic TSH stimulation induced by iodine deficiency); c) consistent data from before and after studies of iodine prophylaxis showing a decrease in follicular TC and anaplastic TC; d) the indirect association between changes in iodine intake and TC mortality in the decade from 2000 to 2010; e) the autopsy studies of occult TC showing higher microcarcinoma rates with lower iodine intakes; and f) the case control studies suggesting lower risk of TC with higher total iodine intakes.
Zimmermann MB et al. Thyroid Res. 2015 Jun 18:8:8.

Iodized salt contribution to iodine nutrition status of Chinese pregnant and lactating women
The aim of the present study was to explore the impact of iodized salt intake on the iodine status of pregnant and lactating women. Thirty towns were selected from 211 towns in the rural areas of Shijiazhuang city using probability proportionate to size sampling in this cross-sectional survey. The median urinary iodine content (UIC) of 1200 pregnant women in all was 146 (interquartile range (IQR) 88–239) µg/L. The median UIC in the first, second, and third trimesters were 166 (IQR 92–276) µg/L, 145 (IQR 83–248) µg/L, and 134 (IQR 79–221) µg/L, respectively. The median UIC in the 1st trimester was significantly higher than in the 3rd trimester (p<0.04). The median UIC of 1200 lactating women was 120 (IQR 66–195) µg/L. Their median UIC in each 4-week block was higher than the WHO criteria except in weeks 25–28 and weeks 33–36 of lactation. Pregnant women’s median UIC did not correlate with median salt iodine (MSI) (r= 0.402), but there was a linear correlation between MSI and the lactating women’s median UIC (r= 0.0007). Iodized salt failed to provide adequate iodine to pregnant women possibly due to limited intake of iodized salt during pregnancy, though it was found to provide adequate iodine to lactating women in the rural areas of Shijiazhuang city.

Iodine deficiency in a study population of pregnant women in Sweden
Iodine deficiency in utero may impair neurocognitive development of the fetus. In Sweden, iodine nutrition is considered to be adequate in the general population. The aim of this cross-sectional study was to evaluate iodine nutrition during pregnancy in Sweden. The study population (n = 458) consisted of two cohorts (from Värmland County, n = 273, and from Uppsala County, n = 186) of pregnant, non-smoking women without pre-gestational diabetes mellitus or known thyroid disease before or during pregnancy. Spot urine samples were collected in the third trimester of pregnancy for median urinary iodine concentration (UIC) analysis. The median UIC in the total study population was 98 µg/L (interquartile range 57–148 µg/L). According to WHO/UNICEF/IGN criteria, population-based median UIC during pregnancy should be 150–249 µg/L. Thus, these results indicate insufficient iodine status in the pregnant population of Sweden. There is an urgent need for further assessments in order to optimize iodine nutrition during pregnancy.

THE IDD NEWSLETTER is published quarterly by the Iodine Global Network and distributed free of charge in bulk by international agencies and by individual mailing. The Newsletter is also distributed to email subscribers and appears on the Iodine Global Network’s website (www.ign.org). The Newsletter welcomes comments, new information, and relevant articles on all aspects of iodine nutrition, as well as human interest stories on IDD elimination in countries.

For further details about the IDD Newsletter, please contact: Michael B. Zimmermann, M.D., the editor of the Newsletter, at the Human Nutrition Laboratory, Swiss Federal Institute of Technology Zürich, idd.newsletter@hest.ethz.ch.

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