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IODINE GLOBAL NETWORK is a nongovernmental organization dedicated to sustained optimal iodine nutrition and the elimination of iodine deficiency throughout the world.
A national survey, conducted in 2008–2009 and 2013–2014, assessed iodine status in Brazilian children after a reduction in the iodine levels in edible salt

In Brazil, iodine deficiency disorders have afflicted the population throughout recorded history. Accounts of goiter and cretinism have been preserved in art and literature, and documented during early scientific expeditions. The first modern global review of endemic goiter, published in 1960 by the World Health Organization, found that close to a half of Brazil’s territory was vulnerable to IDD. These endemic areas were the first to benefit from iodized salt, but the program was soon expanded with the intention to cover the entire population.

Setting the limits for salt iodization

Initially, salt was iodized at 10 mg of I per kg, but this was later revised to permit a range of iodization levels and gradually raised to tackle pockets of deficiency persisting in rural and poorer regions. For example, a national survey in 1994–1995 of almost 17,000 school-age children (SAC), reported that 120 out of 401 surveyed municipalities were iodine deficient, mostly in the impoverished Northeast states. In 1995, a new, higher iodization range was set at 40–60 mg iodine/kg of salt by the national surveillance and monitoring agency ANVISA (1).

But just three years later, ANVISA increased the standard again to 40–100 mg/kg; the rationale was that a broader range would prevent salt producers from adding less than 40 ppm or more than 100 ppm iodine. But this led to overiodization, which tipped the population iodine intake into the excessive range. In 2001, studies linked to the Thyromobil project reported that 86% of school-age children had UIC above 300 µg/L, with a median urinary iodine concentration (mUIC) of 360 µg/L.

Excessive iodine intake for a prolonged period may be harmful. The WHO states that iodine excess may increase the prevalence of chronic autoimmune thyroiditis (in individuals with a genetic trait linked to autoimmunity) and also lead to iodine-induced hyperthyroidism mainly in the elderly (who frequently present thyroid nodules). To safeguard the population against these risks, salt iodization standards were lowered again to 20–60 mg/kg in 2003, and then to 15–45 mg/kg in 2013, although the Brazilian Endocrine Society has expressed concern about the latter reduction (2).

What is the true prevalence of iodine deficiency in Brazil?

Systematic monitoring is a fundamental part of efforts to prevent a resurgence of iodine deficiency in regions where control has already been achieved. Although systematic surveys have been conducted throughout Brazil, they tended to differ in their design, a vast majority were not nationally representative, and they were mostly conducted in the Southeast Region, where iodine intakes have been high. There has been concern that the decision to lower the permitted iodization levels to 15–45 mg/kg, to reduce the risk of excessive intakes, was based on a less than full picture, which may have overlooked iodine deficiency in the North (2).

A national survey (PNAISAL) examines iodine intakes

In 2008, the MoH-led multisectoral Committee for the Prevention and Control of IDD recommended that a nationally-representative survey should assess the availability and impact of iodized salt on population iodine status. Known as PNAISAL (Pesquisa Nacional da Avaliação de Impacto da Iodação do Sal), the survey was completed in two stages: in 2008–2009 and 2013–2014, and its results have not been published until now.

The 2008 cohort included 19,600 school-age children aged 6–14 years from 18 out of 26 Brazilian states plus the Federal District with the capital Brasília. The second stage of the survey coincided with the latest reduction of the salt iodization levels. It included 18,978 school-age children aged 6 to 14 years from public and private schools across all 26 Brazilian states and the Federal District, including the Northeast states of Pernambuco, Paraíba, and Rio Grande do Norte, and the Northern states of Amapá, Roraima, Amazonas, Acre, and Rondônia. During the second stage, almost all of the previously surveyed municipalities were revisited. A subset of 3,601 (approximately 20%) of the students was visited at their homes to collect a sample of household salt for iodine analysis. About three quarters (72.7%) of the children went to schools in urban areas.
School-age children have optimal iodine intakes

The survey has reported a median UIC of 276.75 µg/L (IQR: 175.54, 399.71), which implies that excessive intakes could finally be a thing of the past. Somewhat surprisingly, the Northeast region had the highest (298.80 µg/L) and the South Region had the lowest median UIC (248.02 µg/L); however, both were in the optimal range. No single region had a median UIC that would indicate deficiency among this age group. Younger children, girls, and children in rural schools tended to have lower iodine intakes. Iodine was present in 99.6% of analyzed salt samples, of which 93.6% (95% CI: 91.6–95.6%) contained at least 15 ppm of iodine. The proportion of adequately iodized salt has remained consistently above 90% since 2003.

Salt iodization and salt reduction

In the past decades, Brazil has experienced major changes in its economic, social, and health indicators, on one hand reducing poverty and malnutrition among children, and on the other witnessing a rise in overweight, obesity, and associated chronic non-communicable diseases (NCDs). Geographic variation in dietary intake of iodized salt, processed foods, and even goitrogens (e.g., cassava) have been compounded by socioeconomic and cultural disparities, which together shape the overall nutritional status and health (3).

High intake of sodium (salt) is a risk factor for hypertension and cardiovascular diseases. Estimated in 2002 and again in 2009, total salt intake in Brazil was close to 12 g/day per capita, i.e., more than double the WHO-recommended daily intake. In 2012, cardiovascular diseases were responsible for approximately 30% of all deaths in Brazil, with about 4% of all deaths attributed to hypertension. The Brazilian Cardiology Society estimated that, solely by reducing the average per capita salt intake in Brazil to 5 g per day, deaths by stroke would be reduced by at least 15% and deaths by myocardial infarction would be reduced by 10%. By achieving the World Health Organization (WHO) recommendation, it is also expected that 1.5 million people would not need hypertension drugs, and that life expectancy of hypertensive individuals would be increased by up to 4 years (3).

In 2011, Brazil implemented a National Plan for Tackling Chronic Non-Communicable Diseases, with multilateral support from government and food industry stakeholders, which created a favorable environment for a national strategy for reducing salt consumption (4). Key areas for action included improving the supply and promotion of healthy foods, voluntary reformulation of processed and service industry (restaurant) foods to lower sodium content, better labeling and information, and education of consumers, industries, and health professionals. But one of the key aspects of reformulation has been harmonization of salt reduction with the protection against iodine deficiency disorders with iodized salt. Working together with international organizations including WHO, PAHO, and the IGN, Brazil has developed an exemplary program, which has earned recognition from the international public health community.

References

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Poor rural populations often have lower access to adequately iodized salt

Iodine deficiency can be effectively and inexpensively prevented by iodizing all salt for human and animal consumption, known as Universal Salt Iodization (USI). Since the early 1990s, a global effort has resulted in a large increase in the percentage of the world’s population consuming adequately iodized salt (considered to be salt with ≥15 mg of iodine per kg), from <20% in 1990 (1) to 75% in 2014 (2).

National point estimates of household salt coverage were helpful to track progress after the initial implementation of salt iodization in the early 1990s. However, they may not provide sufficient resolution to assess the quality of salt iodization in the country or tell us why iodization has reached a plateau at levels well below 70% in some countries and subnational areas. Within-country disparities in household coverage of adequately iodized salt, particularly based on socioeconomic status (SES) and residence type (urban vs. rural), have been highlighted before (3,4).

This review summarizes recent household iodized salt coverage data from 8 countries that were part of the GAIN-UNICEF USI Partnership Project during 2013-2015 (Bangladesh, Ethiopia, Ghana, India, Indonesia, Niger, the Philippines, Senegal), together with data from 2 national Fortification Assessment Coverage Toolkit surveys (5) in Tanzania and Uganda in 2015. Included in the study were cross-sectional multistage cluster household surveys using a stratified design and a probability proportional to size methodology, and measuring iodine content in salt with quantitative methods.

**Progress towards USI: programmatic challenges**

Although all 10 countries mandate salt iodization to some extent, and 8 countries include iodization of salt used by the processed food industry in their legislation, this is not always recognized, enforced, or monitored in the same way as household salt. In 2 countries, ≥80% of nationally available salt is sourced from large- or medium-scale domestic producers (India) or salt iodization processors (the Philippines). In Uganda and Niger, almost all salt is imported. However, in Uganda, the import supply chain is highly consolidated (from Kenya), whereas salt sourced by Niger is from a much more fragmented supply chain (from Ghana, Senegal, Algeria, and other countries).

**Salt industry consolidation and technical capacity**

Access to adequately iodized salt varies considerably between countries: from 6.2% in Niger to 97.0% in Uganda. Considerable national progress has been achieved in Uganda and India, but also in Ethiopia, where household coverage with any iodized salt was previously less than 16% (6). But only Uganda has achieved USI (≥90% household coverage with adequately iodized salt), both nationally and sub-nationally, in urban and rural areas. In 5 of the 10 countries, more than 50% of the population remains at risk of iodine deficiency because of limited access to adequately iodized salt (<50% national household coverage in Ethiopia, Ghana, Niger, the Philippines, and Senegal) (Figure 1).
In general, national and subnational areas found to have higher coverage were associated with a higher level of industrial consolidation and mechanization of the salt supply (i.e., India, Uganda, and urban areas of Bangladesh and Tanzania). In line with this, national survey reports for Bangladesh, Senegal, and Ghana indicate that subnational strata representing areas of extensive small-scale salt production had particularly low coverage of adequately iodized salt (<26% of households). This is suggested to be the result of lower technical capacity of small-scale producers to iodize salt, and the increased challenges to establish effective quality assurance and regulatory monitoring of iodization in areas of widespread artisanal salt production.

The methodology to assess poverty and SES varied between countries. In Bangladesh, Ghana, India, Senegal, Tanzania, and Uganda, modules were included to calculate the Multidimensional Poverty Index (MPI) score (7). Wealth indexes based on the type of composite indicators used in Demographic and Health Surveys were modified to define SES indicators in Indonesia and the Philippines. Composite indicators of wealth were not available in Ethiopia and Niger. The national percentage of households categorized as vulnerable to poverty (by MPI) varied from 24.5% in India to 57.1% in Senegal (Figure 2). In Indonesia and the Philippines, respectively 14.5% and 22.3% of households were categorized as being in the lowest wealth quintile, and 20.3% and 16.9% were categorized as being in the highest wealth quintile. In 7 of 8 countries with data (i.e., all except Uganda), household coverage of adequately iodized salt was significantly higher in high-SES than in low-SES households in Bangladesh (68.9% vs. 44.3%), India (86.4% vs. 69.8%), Indonesia (59.3% vs. 51.4%), the Philippines (31.5% vs. 20.2%), Senegal (53.3% vs. 19.0%), Tanzania (89.2% vs. 57.6%). A difference was also seen in Ethiopia (30.6% vs. 23.8%). Conversely, in Niger, coverage in urban households was slightly lower than in rural households (4.5% vs. 8.0%).

**Type of residence and socioeconomic status**

The findings of lower access to adequately iodized salt in rural and lower-SES populations is in agreement with previous reports (3, 4). Coverage with adequately iodized salt was found to be significantly higher in urban than in rural households in most countries: Bangladesh (68.9% vs. 44.3%), India (86.4% vs. 69.8%), Indonesia (59.3% vs. 51.4%), the Philippines (31.5% vs. 20.2%), Senegal (53.3% vs. 19.0%), Tanzania (89.2% vs. 57.6%). A difference was also seen in Ethiopia (30.6% vs. 23.8%). Conversely, in Niger, coverage in urban households was slightly lower than in rural households (4.5% vs. 8.0%).
Understanding the inequities in access to iodized salt

Access to adequately iodized salt at the household level is generally dependent on 2 factors: product availability and affordability. Differences in access reported here by residence type and SES could be the result of one or both of these factors. Further analysis of retail availability and pricing of quality-assured iodized salt, and of consumer purchasing practices (e.g., packaged instead of loose salt or vice versa, etc.) would be required to understand which factors play a role. It is important to note that the aim of USI is to ensure quality-assured iodization of all salt for human and animal consumption, regardless of grain type and packaging. When USI is fully implemented, as demonstrated in Uganda, access to adequately iodized salt would become equitable, regardless of consumer preferences and affordability.

These findings also confirm that the previously identified challenges related to strengthening regulatory monitoring and enforcement of legislation have not been fully ameliorated. This strategy remains as a recommended focus to accelerate progress toward achieving and sustaining optimal iodine status through USI, both nationally and sub-nationally. These challenges remain particularly important in small-scale salt-producing regions.

Implications for national strategies

This review provides important insights to guide future national strategies to achieve USI. For example, in Ghana and the Philippines, the relative difference in household access was much more pronounced by SES than by residence type, suggesting that adequately iodized salt, inadequately iodized salt, and that with no added iodine may all have been readily available in both urban and rural areas. It could be hypothesized that lower-SES households generally have greater access to lower-priced, lower-quality iodized salt. In some cases, this may potentially be salt sourced at the point of production, before any iodization step has taken place, as indicated in the survey reports for Bangladesh, Ghana, and Senegal. In Bangladesh, Senegal, and Tanzania, the level of notable disparity in coverage by residence type that is similar to that by SES could suggest that availability of adequately iodized salt (typically packaged and more expensive in these countries) is linked to urban residence.

Not just household salt

In an environment of increasing consumption of processed foods, condiments, and foods prepared outside the home, there are many other dietary sources of (potentially iodized) salt, particularly in urban areas, where diets tend to be more diversified. As a result, there are increasing international calls for a re-evaluation of the use of household coverage with adequately iodized salt as the sole indicator to measure national progress toward optimal iodine status through USI. Other major sources of dietary salt should be considered when making any assumptions about the adequacy of population iodine intake from USI. For example, in the Ghana and Senegal surveys, the outcome from additional food consumption modules suggests that, if all bouillon was produced with adequately iodized salt, it would contribute significantly to iodine intake across population groups in both countries, including in areas with poor access to adequately iodized household salt.

References

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 multisectoral support.

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Mapping and tracking global food fortification efforts


Preventable micronutrient malnutrition, or “hidden hunger,” is responsible for approximately 10% of the global disease burden; it inhibits human development and perpetuates poverty and deprivation. For decades, fortification of common staple foods such as wheat and maize flour, rice, oil, and salt has been instrumental in preventing the devastating consequences of deficient intakes of vitamin A, vitamin D, iron, iodine, and folic acid.

As national food fortification programs are scaled up, we need to track their performance, improve their impact and ensure sustainability. Responding to a call to action for improved data availability and quality, issued at the 2015 Global Summit on Food Fortification in Arusha, a core group was formed in London in March 2016 comprising four organizations working in food fortification: the Food Fortification Initiative (FFI), the Global Alliance for Improved Nutrition (GAIN), the Iodine Global Network (IGN) and the Micronutrient Forum (MNF). Over the past year we have worked together to develop a new Global Repository of Food Fortification, a tool with the following aims:

- Collate fortification data using standardized indicators applicable to multiple micronutrients and food vehicles to provide a comprehensive national and global picture of the current situation and trends;
- Enable visualization of legislation, standards, intake, and program coverage data;
- Improve the availability and transparency of data to enable governments, donors, implementing agencies, and others in the fortification community to make data-driven decisions about policies and programs;
- Improve cooperation and coordination between national/global stakeholders for more efficient and cost-effective program planning and implementation.

**IN SUMMARY**

**Why is the current situation inadequate?**
Fortification is a proven intervention for improving health outcomes, but the current state of data collection, availability, and synthesis hinder decision-making. Currently multiple databases report different indicators and use inconsistent terminology and definitions. To enable uniform global monitoring, we need greater alignment across all fortification programs and among all program stakeholders.

**What goals will a centralized global repository help to achieve?**
The repository will provide a resource for governments, donors, and implementing agencies to make data-driven decisions about fortification policies and programs. It will synthesize available global and country data on the supply and demand for fortified foods and the status of fortification legislation and regulations, using a set of standardized indicators. This will enable harmonized reporting for multiple nutrients and food vehicles, simplify the tracking and analysis of global data, and in turn help evaluate and improve aspects of programs that are not working. This model mirrors the experience from countries, which shows that better alignment and coordination between all program stakeholders makes planning and implementation more efficient and cost-effective.

**Who is responsible for the new repository?**
Four organizations working in food fortification are collaborating on this project: the Iodine Global Network (IGN), the Food Fortification Initiative (FFI), the Global Alliance for Improved Nutrition (GAIN), and the Micronutrient Forum (MNF). All four are equally vested in the successful deployment of national fortification programs. Our work is designed to complement each other’s efforts and the efforts undertaken by other agencies (e.g. WHO and FAO).

**Which foods and indicators will be included in the repository?**
Initially, we will focus on five major foods: (1) salt, (2) wheat flour, (3) maize flour, (4) rice, and (5) oil and spreads. Later on, we will add soy sauce, sugar, and micronutrient powders. Three of the core agencies will serve as data stewards: FFI (wheat, maize and rice), GAIN (oil) and IGN (salt). There will be 10 core indicators relevant to legislation and standards, fortification vehicle supply and consumption, industry landscape, internal and regulatory monitoring, compliance, coverage and impact.

- Eventually serve as a model that could be used by other interventions to generate robust data, inform program coordination, and optimize strategies to improve micronutrient intake across all population groups.
Key activities to date

**Developing indicators, concept, and structure of the repository**

In this phase, we developed an initial set of core indicators based on available data on the supply and demand for fortified foods, and the status of fortification legislation, regulations, monitoring, and compliance. This was important, as each agency had employed different names and definitions, so standardization was an essential step towards uniform metrics. In parallel, we outlined a process for continuous collection of updated data. The outcomes of these efforts were validated via consultation with the Global Fortification Technical Advisory Group (GF-TAG), an expert food fortification community with over 30 national and global partners. In August 2016, Camber Collective and TenPoint7 were recruited by the Bill and Melinda Gates Foundation to assist us in developing the repository design and building a prototype. The repository was further developed and populated before the core group presented the concept at the Micronutrient Forum in Cancun, in October 2016, and solicited community feedback. A prototype repository was released in March 2017, and feedback from GF-TAG members is being used to inform the next steps.

**Public launch and communication to stakeholders**

We will launch a publicly-available web-based version of the repository in July 2017, with national data for three core indicators (related to mandatory legislation, nutrient levels in standards, and food vehicle intakes). During this period, we will also establish a database management structure to facilitate data entry. The data will be entered into the database by each agency and will sync with the online repository on a regular basis.

To accompany the public release of the repository, communications targeting governments, partner agencies and donors, will be developed which will include technical articles, user documentation and training materials, and presentations at key international meetings, such as the IUNS 21st International Congress of Nutrition (ICN) in Buenos Aires, October 2017.

**Expansion and transition to a permanent host, data collection strategy**

By the end of the final stage (December 2018), the repository will be available through a permanently-hosted site and will include all ten of the core indicators identified via collaboration with the GF-TAG.

A strategy for harmonized data collection of indicators across all fortification vehicles will be developed based on the availability of ‘unified fortification focal points’ at the country level. We see this as an opportunity to strengthen the integration of individual fortification programs at country level and to ensure country level data ownership. These focal points will be identified from national food fortification stakeholders.

Data collection will initially be tested in a small set of countries (with broad representation). Based on the lessons learned from the process, the data collection will be scaled up to more countries, prioritizing large countries with well-established programs and those with mandatory fortification of multiple vehicles. We will meet in August 2017 to plan the harmonized data collection pilot and again in January 2018 to plan scale-up efforts based on the lessons learned.

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To find out more about the Global Repository of Food Fortification, please contact Jonathan Gorstein at jgorstein@ign.org
Mozambique renews its commitment to salt iodization

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Salt production in Mozambique is concentrated in three north-eastern provinces: Cabo Delgado, Zambezia and Nampula

Mozambique is a country in south-eastern Africa on the Indian Ocean with an estimated population of 28 million. Mozambique adopted a mandatory law on salt iodization, and the country has had a national IDD control program for the past 16 years. UNICEF has been at the forefront in championing salt iodization across the region, and in recent years, the Global Alliance for Improved Nutrition (GAIN) has joined forces with the Government and UNICEF to scale up existing interventions to improve the nutritional status of women and children in Mozambique.

In 2011–2012, a survey of almost 3000 women of reproductive age reported that iodine intakes in Mozambique are mildly deficient (based on a median urinary iodine concentration of 97 µg/L). At the same time, successive household and spot surveys have shown that iodized salt household coverage in Mozambique is decreasing, most likely as a result of a decreasing availability of potassium iodate. This downward trend is of concern as it could have an adverse effect on the population iodine status.

To improve the availability and quality of iodized salt on the market, GAIN is currently focusing on three complementary program areas to create an enabling environment:

• Strengthening the national food fortification policy to ensure that it includes salt iodization;
• Improving the sustainability and quality of the iodized salt supply;
• Integrating salt iodization and food fortification regulatory monitoring, and improving regulatory monitoring of salt production and salt imports.

To address these issues, GAIN and UNICEF supported the National Directorate of Industries (DNI) and the National Salt Program (PRONIS) to host a National Salt Iodization Workshop in Beira, the capital of the Sofá Province, on 18–20th April, 2017. This meeting was also an opportunity to strengthen program leadership and political commitment to USI by bringing all stakeholders together. Represented by Dr. Vincent Assey (Regional Coordinator for Eastern & Southern Africa), the Iodine Global Network was invited to share its experiences and contribute to the efforts to sustain USI in Mozambique. The meeting was inaugurated by the Governor of the Sofá Province, Hon. Mme Maria Helena Taipo on behalf of the Minister of Industry and Commerce. There were close to 200 delegates in attendance, including Directors from the Ministry of Industry and Commerce, the Ministry of Health, the Tax Revenue Authority, the Bureau of Standards, salt producers (small, medium and large-scale), food inspectors, provincial representatives of Industry and Commerce, public health experts, and the media. For the IGN, the workshop was an opportunity to partner with UNICEF and GAIN—the two organizations with established operations in the country. The meeting’s discussion points and outcomes are summarized below.

USI situation analysis in Mozambique

Despite ongoing efforts for the past 16 years to achieve USI, the goal has remained out of reach. Furthermore, the decline in the availability of iodized salt is alarming. The 2011 DHS showed that iodized salt is least available in the most populous provinces of Nampula and Zambezia, where about 40% of the Mozambican population lives. Since 2015, KIO3 procurement is no longer the responsibility of development partners; it now rests on the salt producers. But a survey conducted by Third Way Africa (TWA) earlier this year in salt-producing areas in three provinces—Cabo Delgado, Zambezia, and Nampula—indicates that most of the small-scale salt producers no longer have access to the fortificant, and they have
ceased to iodize their salt. Given this report and the presence of mild deficiency, there has been concern that pregnant women, newborns, and children under 24 months may be suffering from moderate or possibly even severe iodine deficiency, particularly in rural areas. In light of these facts, Mozambique could be in heading for a crisis, which could be staved off by providing a stable potassium iodate supply. In the meeting, the Government responded with a strong commitment not only to improve the health of the population, but also to develop the salt industry eventually to fuel further economic growth in Mozambique.

Fixing the supply of potassium iodate
There are as many as 400 salt producers operating in Mozambique, mostly small- and medium-sized. The KIO3 required to meet the national demand for iodized salt is estimated at 5–7 metric tons per year. According to a recent consultancy report, out of 40 salt samples collected from ready-to-sell salt in the three salt producing provinces, 83% were not iodized. The salt producers in attendance expressed willingness to adhere to the mandatory iodization law. However, both salt producers and food inspectors cited diminishing stocks of KIO3 as the primary reason why so few of them were iodizing salt. The issue has been blamed on the inflexible importation procedures, which allow only a handful of strictly vetted companies to import KIO3 as well as the premix used to fortify other staple foods, and which have been put in place to ensure quality. To meet the current critical demand, it was suggested that a request be sent to UNICEF and other partners to help with immediate procurement of the fortificant to improve access to iodized salt in Mozambique.

Consolidating the salt industry and improving coordination among stakeholders
The salt industry is fragmented, and there is insufficient cooperation among the stakeholders to achieve universal coverage with adequately iodized salt. Based on insights from other countries in the region (especially Tanzania) and elsewhere (e.g., Haiti, Bangladesh) shared by the partner agencies, industry consolidation is a suitable if not the only approach that can provide adequate support to small-scale producers. Initiatives are already afoot to encourage investment from the few large-scale salt producers in Mozambique into purchasing, processing, iodizing, packaging, and marketing the salt produced by the small-scale majority. The SUN Business Network Mozambique is among the partners who could support this initiative. At the same time, there are currently no mechanisms in place to allow salt producers to come together and speak in one voice on issues that affect them, including how to achieve USI. There are only a few provinces with registered Provincial Salt Associations, and the salt producers lack knowledge about the potassium iodate suppliers accessible to them. To rectify this situation, a National Association of Salt Producers should be formed as a lobby group to act in the interest of salt producers and to spearhead industry development. In parallel, a National Salt Commission should be appointed to tackle immediately the critical issues emerging from the meeting. The Commission should engage with all USI stakeholders to work towards establishing a sustainable KIO3 supply system.

Temporary return to knapsack spray iodization technology
In the short term, a return to hand spray-pump (knapsack) technology to iodize salt was advocated as a stop-gap measure to help resolve the crisis, to be adopted by producers whose current technology is an additional barrier to iodization. This measure was previously adopted with success in the neighboring Tanzania and Ethiopia as well as in other regions. But because of the lower accuracy of spray-pump technology, close supervision will be required for small-scale producers to ensure they can achieve the iodization levels prescribed in the national standards.

Building capacity for regulatory and internal monitoring
Inadequate enforcement of the iodization law in Mozambique, like in many countries, is an underlying problem which contributes to the continuing presence of non-iodized salt on the market. By including salt iodization regulations into the new national food fortification law, the capacity for regulatory monitoring could be improved. Monitoring of the iodization process at all stages, from producers through distributors and retailers to consumers, is lagging behind, and there is a need to strengthen the QA/QC steps at production level as well as the surveillance system for salt at distribution and consumer levels. Rapid test kits are commonly available for assessing the presence or absence of iodine in iodized salt. Quantitative methods for accurate iodine content determination are currently only available at the National Public Health Laboratory; there is a need to equip sentinel labs across the country for use by the producers to ensure they’re meeting the standards.
Conclusions and next steps
The workshop concluded with the following urgent and long-term recommendations:

- The Government and development partners should identify a means of securing a KIO3 supply to curb the shortage within the next three months, before the start of the salt production season.
- Partner agencies are invited to support the urgent procurement of KIO3. GAIN’s credit facility for KIO3 offers payment terms of 40 to 60 days, which may be challenging given that there are no funds pledged at the moment.
- The Government should review its vetting process to make sure there is sufficient flexibility to allow capable local investors to procure KIO3 as long as they can adhere to the required quality standards.
- Small-scale salt producers are encouraged to adopt knapsack spraying technology but only as a temporary measure to help curb the shortage of iodized salt. In the long term, all salt producers are urged to improve the quality of their salt products to be competitive on the global salt market.
- A National Association of Salt Producers should be appointed to mobilize salt producers and enable the development of the salt industry, including management of a cost-recovery system for KIO3.
- The monitoring capacity of regulatory bodies should be strengthened to improve legislation enforcement.
- The population iodine status should be monitored regularly, especially in light of the dwindling coverage of iodized salt.
National survey in Israel reports one of the lowest iodine intakes in the world


The first national iodine survey conducted in Israel has revealed a high burden of iodine deficiency among Israeli schoolchildren and pregnant women. Government funding and legislation, and a government-regulated programme of salt iodization, are essential to reducing this burden, which poses a high risk of impaired neurological development.

Iodine deficiency is a key global risk factor for impaired child development, and the World Health Organization recommends routine monitoring of population-based data on urinary iodine every five years as a means of sustainable elimination of IDD. Yet Israel is among the few countries that have never performed a national iodine survey and does not provide iodine prophylaxis. Researchers from the Hebrew University of Jerusalem, their colleagues at Maccabi Healthcare Services and Barzilai University Medical Center in Ashkelon in Israel, and ETH Zurich in Switzerland, with support of the Iodine Global Network, have obtained the first nationally representative data about iodine status in the Israeli population. To do this, they collected pre-discard spot-urine samples from 1,023 school-age children and 1,074 from pregnant women, representing all regions and major sectors in Israel (Arab, Jewish secular and orthodox), during 2016 at the Maccabi Healthcare Services (MHS) central laboratory.

The median urinary iodine concentration (mUIC) among Israel’s pregnant women was only 61 µg/L and for school-age children it was 83 µg/L, which suggest that the iodine status in Israel is amongst the lowest in the world. Virtually no differences were seen between different ethnicities and regions of the country suggesting that low iodine status is widespread and universal.

"The immediate implication of our findings is that we need to improve the public’s intake of iodine," said Prof. Aron Troen, Principal Investigator at the Nutrition and Brain Health Laboratory, School of Nutrition Science, Hebrew University’s Robert H. Smith Faculty of Agriculture, Food and Environment. "It seems that as in most other countries, Israel's food supply and our collective dietary habits do not ensure iodine sufficiency. Thus eliminating iodine deficiency and achieving optimal iodine status in Israel’s population will require a sustainable, government-regulated program of salt or food iodization. The costs are small and the benefits substantial and have been proven in over 160 countries around the world where this is done."

Currently, only a small fraction of the salt sold in Israel is iodized, and it is sold at a much higher price than regular salt, although it does not need to be. The World Health Organization and the Iodine Global Network encourage mandatory, universal salt iodization, including the all discretionary household salt. However, some countries have effectively been able to increase their iodine intakes through the use of iodized salt in processed foods, including bread and condiments, and this may be considered in Israel. "I'm pleased that the Ministry of Health has been supportive of this particular research effort, but to act on the findings and make a sustainable change will require government funding and legislation," added Prof. Troen.

These findings also highlight the critical need for routine public health surveillance, not only of iodine, but also of other nutritional and environmental exposures that determine the Israeli population's collective health.
In December, 2016, the Iodine Global Network published its new map of global iodine nutrition. Notably, the status of the UK, which was classified as mildly iodine deficient in 2014–15, had become adequate by 2016. The reason for this apparently rapid improvement lies in the different data sources used; data that showed mild deficiency in 2014–15 came from spot-urine samples from 737 girls aged 14–15 years from nine UK centers, with a median urinary iodine concentration (mUIC) of 80.1 µg/L, whereas the 2016 data were based on spot-urine samples from 458 boys and girls aged 4–18 years, which were collected in year 6 of the UK National Diet and Nutrition Survey (NDNS). The result from the group aged 4–18 years (mUIC 138 µg/L) is within the adequate range, as defined by WHO. However, these new mUIC data should not lead to complacency; indeed, the new figures might mask the presence of deficiency in some population subgroups.

Considerable disparity exists between the conclusions based on the mUIC measurements in spot-urine samples from year 6 and those based on iodine-intake data (from 4-day food diaries) in years 5 and 6 of the NDNS. Although the limitations of food-diary analysis for iodine-intake estimation are recognized, they are less of a concern in the UK than in countries that have iodized salt (salt intake is hard to quantify in dietary surveys). We would therefore expect mUIC and dietary-intake data to tell broadly the same story. Yet, the mUIC of children aged 4–18 years is 138 µg/L, which implies adequacy, whereas 6–21% of children have an iodine intake below the lower reference nutrient intake (LRNI), which implies deficiency, especially in older children. The LRNI is based on the intake required to avoid goiter, and is between 30 and 70 µg per day in children aged 4–18 years.

Where possible, IGN maps of global iodine nutrition are based on mUIC data from boys and girls aged 6–12 years, since WHO thresholds are intended for use in school-aged children. In 2014–15, in the absence of such data for the UK, the classification was based on a UK study of girls aged 14–15 years. However, girls tend to have a lower iodine intake (and thus status) than boys, and older children (adolescents) have a lower iodine intake than younger children. This difference in intake might partly explain why the 2014–15 IGN map showed mild iodine deficiency in the UK, whereas the 2016 IGN map, based on boys and girls from the age of 4 years, showed adequacy. The difference in iodine intake by age and sex can probably be explained by the considerably lower intake of milk, the principal source of iodine in the UK, in teenage girls than in younger children (e.g., 110 g per day in girls aged 11–18 years vs 196 g per day in boys and girls aged 4–10 years).

To some extent, this disparity highlights the fact that children aged 6–12 years might not be the most appropriate group to represent population status. This fact is especially true in countries such as the UK where intake of the main source of iodine (milk) varies with age. Furthermore, pregnant women are often susceptible to iodine deficiency, even in countries in which the general population is iodine sufficient. IGN has recognized this issue by producing, for the first time in 2016, a separate map of iodine status in pregnant women, again based on mUIC. Unfortunately, pregnant women are not sampled in the NDNS, but on the strength of accumulated evidence from the past 10 years, the map shows that pregnant women in the UK are iodine deficient. This deficiency in pregnancy is consistent with the NDNS data that show that 11% of women aged 19–64 years have an intake of iodine that is below the LRNI.

Although measurement of mUIC is the method recommended by WHO to describe the iodine status of a population, it is acknowledged to have substantial limitations because the median value does not give any indication of the proportion of the population that is iodine deficient. Collection of a second urine sample in a subset, enables adjustment for intra-individual variation and the estimation of the proportion of the population with usual intake below the estimated average requirement—the so-called estimated average requirement cut-point method. This method enables assessment of the prevalence of iodine deficiency in a population and, together with the mUIC, gives a more complete picture of nutritional status. Therefore, we would urge the NDNS investigators to collect a repeat urine sample, at least in a subset, in future surveys.

Has the UK really become iodine sufficient?

Can processed foods containing iodized salt contribute to dietary iodine intake?

Robin Houston  IGN Senior Advisor, Nita Dalmiya  IGN Regional Coordinator for West & Central Africa, Karen Codling  IGN Regional Coordinator for South East Asia & Pacific; Jonathan Gorstein  IGN Executive Director

A Technical Consultation on assessing the contribution of processed foods to iodine and salt intake took place in Dakar, Senegal on February 13–14, 2017. Facilitated by the Iodine Global Network, the meeting had broad agency representation including UNICEF, GAIN, Micronutrient Initiative, Helen Keller International, GroundWork, and The George Institute for Global Health.

Since the 1990s, Universal Salt Iodization (USI) has been the most cost-effective strategy to eliminate iodine deficiency as a public health problem around the world. Although USI by definition includes all salt for human and animal consumption, in practice it has come to be associated with household salt (i.e., table or cooking salt used in meal preparation at home), which has been the focus of national monitoring. Globally, the household use of iodized salt has increased from 20% in the 1990s to 75% today. However, there is a discrepancy between iodized salt coverage levels and population iodine status based on national median urinary iodine concentration (MUIC). This suggests that some populations are consuming iodine from sources other than household salt, most likely iodized salt used in processed foods, which is not captured in household surveys. Where this is the case, salt iodization programs need to be adapted to pay more attention to these sources of iodine. The objective of the Technical Consultation was to discuss the need and outline the steps needed to assess iodine intake from processed foods and the efforts to ensure that all salt in processed foods is iodized. The steps proposed were as follows:

**Step 1: Review the current situation, including legislation**

To identify the foods that provide significant dietary iodized salt, it may be necessary to review trade/industry data, consumption or expenditure survey data, market surveys for fortified foods, as well as other reports that explore whether the salt in processed foods is iodized. A review of sales patterns of specific foods may help to estimate their consumption by all sub-populations. The wording in legislation mandating iodization of salt should be clear with regard to iodized salt use in the food industry. It may be necessary to advocate for an amendment that specifically mentions the use of iodized salt in processed foods.

**Step 2: Assess market availability of processed foods contributing to iodine intake**

The goal of this assessment is to identify processed foods that contain enough iodized salt or are eaten in sufficient quantities to make a significant contribution to iodine intake (e.g., fish sauce, bouillon, or other widely used condiments). In countries with insufficient iodine intakes, iodization of the salt used in these foods could be a useful strategy to improve iodine intake.

Where iodine status is already optimal, it is important to track changes in consumption patterns of these foods to prevent a decline in iodine intakes. Critical to this step is a situation analysis of the processed food industry in countries to determine the scope and size of the manufacturers of key salt-and iodine-rich food products.

**Step 3: Assess consumption patterns of processed food contributing to iodine intake**

This is to understand the demand for processed foods and condiments which are most likely to contain iodine (such as iodized salt), and whether that demand translates into a real contribution to iodine intake across all population segments. Assessment of consumption patterns can also be useful in the discussion on efforts to reduce salt intake.

**Conclusions and next steps**

- Majority of salt iodization legislation includes processed foods, but its effectiveness can be weakened by ambiguity as well as poor enforcement.
- Contribution of processed foods to salt/iodine intake can vary sub-nationally and change rapidly, and there is a need for improved monitoring systems.
- Assessment of salt intake, including from processed foods, is important in the context of salt reduction efforts and is being led by the salt reduction community.
- It is often possible to roughly estimate the contribution of processed foods to salt/iodized salt intake and to identify the important contributors. A comparative study of the available tools and methods of estimating intake, together with relevant case studies, should be developed.
- Guidance should be developed on legislation, methods of assessing the main sources of iodine/salt, interpreting the available data (UIC, household salt coverage, and sources of iodine).
- The group will collaborate to support the assessment process in selected countries.
The IGN’s 2016 Annual Report

Towards the elimination of IDD by 2020

Jonathan Gorstein  IGN Executive Director

2016 was a positive and productive year for the IGN and the global effort towards the elimination of iodine deficiency disorders (IDD). In April 2016, we marked 30 years since the founding of the International Council for the Control of Iodine Deficiency Disorders (ICCIDD). Today, as the Iodine Global Network (IGN), our work continues to be guided by four core pillars:

Harmonization of national and global iodine programs. In 2016, we collaborated closely with the Food Fortification Initiative (FFI), the Global Alliance for Improved Nutrition (GAIN) and the Micronutrient Forum (MN Forum) to develop a global repository of standardized data on the status of food fortification programs. We also facilitated USI program reviews in Bangladesh, Indonesia, and Tanzania, developing joint work plans with all key partners.

Advocacy for political will. In 2016, we focused on messages about the impact of optimal iodine nutrition on fetal brain development, the use of iodized rather than non-iodized salt in processed foods and condiments, and aligning USI with salt reduction efforts. At the country level, our work helped to build commitment and political will amongst policymakers and the salt industry.

Program monitoring. We worked closely with UNICEF and WHO to revise program guidance to better assess the implementation of USI through enhanced tracking of iodized salt coverage and quality. In 2016, we focused on new tools and indicators to measure the dietary iodine contribution from different sources and on better approaches to analyzing and presenting data on iodine status in populations.

Rigorous research. In 2016 we investigated whether a successful USI program can meet the needs of all segments of the populations, particularly those most vulnerable including pregnant women. The IGN initiated important research in several geographic settings with academic partners to better estimate the magnitude of iodine insufficiency in different population groups.

Across these pillars, we have conducted a remarkable breadth of work throughout the world in 2016. Still, it is the work that we undertake at the regional and county level which defines our contribution towards improved iodine nutrition. Some of our activities are summarized below:

• In the Americas, we celebrated a tremendous achievement and a global first: the virtual elimination of IDD. In the USA, the IGN worked with the American Thyroid Association (ATA) and the Council for Responsible Nutrition (CRN) to promote the importance of iodine and the cost-effectiveness of USI. In Haiti, in collaboration with UNICEF, USAID and the Ministry of Health, we conducted a comprehensive analysis of iodized salt in processed foods and its potential to improve iodine status. In Argentina, the IGN investigated how to further increase the reach of iodized salt in rural areas by supporting small-scale salt producers in the Northern provinces.

• In Western & Central Europe, the IGN sponsored a scientific symposium on iodine and pregnancy in London. In Sarajevo (Bosnia & Herzegovina), we co-hosted with UNICEF a regional sustainability workshop to address challenges around iodine supply, quality of iodized salt production, and program monitoring. We provided technical support in Israel for a survey, which noted sub-optimal iodine intake, and this data are being leveraged to establish a national USI program. We have continued our engagement in the EUthyroid Project, a coalition that brings together partners to support research and advocacy needed to eliminate IDD in this region.

• In the Middle East & North Africa, the IGN played a major role in convening partners and strengthening national USI program coalitions. To improve the USI program of Sudan, we supported technical and senior policy experts to travel to Spain to meet with Serra Salt Industries, where an agreement was reached to supply salt processing equipment to three salt refineries over the next two years. These new efforts put Sudan on track to achieve >90% coverage by 2019. In Lebanon, the IGN worked with UNICEF, American University of Beirut (AUB) and the Ministry of Health to revise legislation and to revitalize the salt industry. The IGN provided technical assistance for several national IDD surveys and research studies in Yemen, Djibouti, Egypt, Oman, Qatar, Saudi Arabia, and Bahrain. We participated in a celebration of significant improvements in iodine status in Egypt thanks to the collective efforts of multiple partners.

• In Eastern Europe & Central Asia, the IGN supported a communication campaign targeted to policymakers in Russia to generate support for mandatory legis-
tion on national food fortification, which is in the final stages of endorsement by the Duma. Working with the National CDC in Georgia, we implemented a sentinel monitoring system for micronutrients to track iodine status in school-age children and pregnant women. The IGN supported three iodine surveys in the region: a national assessment in Armenia (together with Columbia University, Yerevan State Medical University and Boston Medical Center) and two small-scale surveys, in Abkhazia and in Nagorno-Karabakh.

- In **West & Central Africa**, we worked to better understand the contribution of iodized salt in processed foods and condiments, including bouillon, to dietary iodine. We worked with UNICEF to assess the processed foods markets in Burkina Faso, Ghana, Niger, Senegal, and Togo. With partners and national USI coalitions, we worked to ensure that USI legislation covers all edible salt, including that used in processed foods.

- In **Eastern Africa**, the IGN supported the revision of strategies to improve the coverage and quality of iodized salt, with a focus on the salt industry. In Tanzania, the IGN undertook a comprehensive program review with UNICEF, GAIN, MI, the Ministry of Health, and salt producers. Through this effort, steps were identified to consolidate the salt industry by working with small-scale salt producers and establish centralized salt processing facilities. This follows a model now being implemented in Ethiopia.

- In **Southern Africa**, the IGN provided technical assistance to improve iodine nutrition in several countries. We facilitated the analysis and reporting of a national survey in Madagascar which indicated an alarmingly low iodine status. We worked with UNICEF and the Government of Madagascar to develop a strategic plan to address this problem. In Angola, we collaborated with Groundwork LLC, the Ministry of Health, and the Ministry of Fisheries to carry out a national program review, which led to recommendations to strengthen the salt industry and iodization activities.

- In **South Asia**, the IGN continued its longstanding association with the Government of India and other key partners to celebrate recent progress and to identify how to further strengthen USI. The IGN collaborated with UNICEF on an inter-agency review of the program in Bangladesh to examine current needs and revise strategic priorities. In addition, the IGN participated in discussions to explore opportunities and challenges of double fortified salt (DFS), which would include iron as well as iodine. The approach under consideration is to deliver DFS through the public distribution system to reach only the most vulnerable segments of the population, but there is still much work to be done.

- In **China**, the IGN worked with partners, particularly UNICEF and WHO to support the Government and salt industry in the face of changes to the salt monopoly. While China maintains adequate iodine status at a national level, and has one of the most successful USI programs in the world, the industry reforms will require adjustments in program strategy and intensive monitoring. The IGN participated in a series of national advocacy meetings to support the sustainability of the USI program following industry reforms. In preparation, the IGN developed several policy briefs describing threats which have occurred to other national programs following policy change.

- In **South East Asia & The Pacific**, we worked closely with UNICEF, MI and Government partners to help revitalize USI efforts in countries which had experienced backsliding in program performance. For example, in Vietnam, the IGN contributed to the successful re-enactment of mandatory salt iodization and is now providing support to re-launch the USI program. In Papua New Guinea, we conducted a situation analysis to better understand salt market dynamics and established a robust monitoring system to track the adequacy of iodized salt imported into the country. The IGN convened key partners to undertake a comprehensive review of the national USI program in Indonesia, reflecting on how best to sustain progress and align USI with the broader fortification agenda.

In the last year, we said goodbye to some of the giants who pioneered this work. We lost Basil Hetzel, John Stanbury, Peter Laurberg, and Harry Black, all tremendous visionaries whose groundbreaking operational and scientific research provided the basis for the global progress against IDD. It was Basil’s vision that led to the founding of the ICCIDD in 1985 in Nepal, and it was his meticulous scientific work and its application which awakened the world to action against IDD, recognized as the single greatest preventable cause of mental retardation. Indeed, the main objective of the IGN is to support programs to achieve optimal iodine intakes and prevent deficiency in all countries—a public health triumph befitting the bold vision of these leaders, who paved the path.

We have entered 2017 with great optimism that we are on track towards the global elimination of IDD by 2020. Together with partners, we are accelerating activities to establish and strengthen USI programs in countries that are still burdened by iodine deficiency, and continue to support those which need to sustain their progress.

Executive Director of the IGN since April 2015, Jonathan Gorstein has been working to support the design and implementation of large-scale nutrition programs, including USI, in developing countries for over twenty five years with a focus on strengthening capacity and monitoring and evaluation. He is currently a Clinical Associate Professor in the Department of Global Health at the University of Washington, Seattle.
Today, we are on the verge of eliminating iodine deficiency – a public health triumph that ranks with getting rid of polio and smallpox. GAIN, together with the World Health Organization (WHO), the Iodine Global Network (IGN), the Swiss Federal Institute of Technology (ETH) and Effective Altruism Geneva organized the event ‘Towards the Elimination of Iodine Deficiency by 2020’ on Tuesday, 23 May 2017, on the sidelines of the 70th World Health Assembly in Geneva, Switzerland.

“We can control iodine deficiency disorders globally in the next five to ten years”, said GAIN’s Director of Food Fortification, Greg S. Garrett. “It will probably take another USD 30 million to get the job done and provide sustainable access to iodine through iodized salt in these 19 countries that remain iodine deficiency today. GAIN and all the partners involved want to mobilize these resources and work together with government and industries to achieve this goal”, he added.

“We need to walk this last mile together,” said Dr Francesco Branca, Director of WHO’s the Department of Nutrition for Health and Development, who reiterated that salt iodization is the preferred strategy to end iodine deficiency disorders. “The recommendation is now that all food grade salt used in household and food processing should be fortified with iodine as a safe and effective strategy for the prevention and control of iodine deficiency disorders in populations living in stable and emergency settings.”

Jonas Vollmer, Director of Communications at the Effective Altruism Foundation, talked about why people should donate to programmes like IDD elimination. He outlined the philosophy behind the Effective Altruism movement and how effective organizations are assessed. “Salt iodization meets all the criteria of interventions supported by effective altruists: effectiveness, cost-effectiveness, room for more funding, and transparency”, said Jonas.

Watch the event in full (YouTube), and download presentations: goo.gl/LUzDNO

Talking about iodine deficiency during ITAW and on 10th World Thyroid Day

Opening the 10th International Thyroid Awareness Week, a special episode of “Life Matters” devoted to iodine deficiency was broadcast on Monday, 22 May, on the Australian Radio National (RN). Host Amanda Smith invited IGN’s Prof. Cres Eastman (Professor of Medicine Sydney Medical School, Principal at the Sydney Thyroid Clinic, Consultant Emeritus, Westmead Hospital) and Karen Charlton (nutritional epidemiologist at the University of Wollongong’s School of Medicine) to discuss iodine deficiency in Australia. Following the introduction of iodized salt in bread baking in Australia, iodine intakes have improved, but pregnant women are thought to be iodine deficient. Furthermore, bread consumption among women of reproductive age may be too low to provide sufficient iodine. The programme discussed the importance of including milk and dairy as a source of dietary iodine, and helped explain the differences between varieties of salt, encouraging Australians to always buy the iodized kind.
Dr. Chandrakant S. Pandav awarded for his life-long contribution to public health

Dr. Chandrakant S. Pandav, IGN Regional Coordinator for South Asia and former Professor of the Centre for Community Medicine at the All India Institute of Medical Sciences (AIIMS), New Delhi, was awarded the WHO Public Health Champion Award on April 07, 2017. This award was bestowed on Dr. Pandav for his long and sustained service to public health. The presentation took place at a National Consultation organized jointly by WHO and the Indian Ministry of Health & Family Welfare (MoHFW) to commemorate the World Health Day 2017.

Dr. Pandav, a well-known public health figure in India, holds an MD in Community Medicine from AIIMS, and M.Sc from McMaster University Hamilton, Canada with specialization in Health Economics, Clinical Epidemiology and Biostatistics. Dr. Pandav is also an alumnus of the Department of Human Nutrition, at the London School of Hygiene and Tropical Medicine. He was the Vice-President (2006–2010) and President (2010–2013) of the Indian Public Health Association and President of the Indian Association of Preventive and Social Medicine (IAPSM) (2007–2008). Since 1983, he has acted as WHO and UNICEF Consultant on iodine deficiency disorders to over 60 countries in South Asia, Western Pacific, Middle Eastern, and African countries.

Dr. Pandav’s work on iodine deficiency disorders (IDD), micronutrients, health systems research, health economics, health policy, health programme evaluation, public–private partnerships, and human rights has earned him wide recognition. Dr. Pandav is Co-Editor of 14 health sciences books and author of more than 400 research papers in national and international journals. Dr. Pandav is a past recipient of the prestigious Dr. M.K. Seshadri Prize, and the ICMR Gold Medal in 2000 for his outstanding contributions to community medicine.

The WHO Country Office for India first instituted the prestigious Public Health Champions Award in 2015. Its goal is to acknowledge public health champions, honor and recognize the efforts of both individuals and institutions who have made an outstanding contribution to public health through advocacy and involvement in impactful health policies, strategies, and programmes leading to proven public health impacts and a substantial improvement in the health outcomes in the country.

Iodine in Food Systems and Health 1st International WIA Conference

The World Iodine Association (WIA) has announced the dates and location of its first international meeting: 15–17 November, 2017 in Pisa, Italy.

This conference aims to bring together scientists and other stakeholders working on various aspects of iodine in food systems, to increase understanding on how variations in the earth’s supply of iodine affect human and animal health. The Scientific Steering Committee, chaired by Prof. Margaret Rayman has engaged key-note speakers on iodine in the environment, food, health and industrial uses to present the state of iodine research in their fields, and identify data gaps and opportunities.

The registration is now open: http://conference.worldiodineassociation.com/registration/

The World Iodine Association (WIA) represents iodine producers, processors, distributors and end users in relevant industry and government bodies. The association offers a central information platform on uses, applications and benefits of iodine for industry and health of humans and animals. Membership in WIA is open to companies and members not involved in the industry, such as non-profit organisations and civil societies working on projects concerning iodine from their scientific interest.

To receive updates on the international conference please contact info@worldiodineassociation.com.
ABSTRACTS

Eliminating iodine deficiency in China: achievements, challenges and global implications

China stands at the forefront of the global fight against IDD with one of the most successful programs in the world. High level political commitment, national mandatory legislation, a state-managed edible salt industry, and a complex and highly sophisticated surveillance system have facilitated the success of the program. Challenges have arisen however, including: (i) concern that adequate iodine status in pregnant women cannot be achieved without causing above adequate iodine intakes in children; (ii) declining iodine intake as a result of reduced salt consumption and increased consumption of processed foods, which may not be made with iodized salt; (iii) the existence of areas with high iodine content in the water; and (iv) declines in household use of iodized salt due to concerns about excess iodine intake and thyroid disease. This article reviews the achievements and implications of the Chinese Iodine Deficiency Disorders (IDD) Elimination Program and reflects on lessons learned and implications for other national salt iodization programs.


Iodine supplementation for women during the preconception, pregnancy and post-partum period

This review assessed the benefits and harms of supplementation with iodine, alone or in combination with other micronutrients, for women in the preconception, pregnancy and postpartum period on their and their children's outcomes. The authors searched the Cochrane Pregnancy and Childbirth Trials Register and the WHO International Clinical Trials Registry Platform (ICTRP), and contacted experts to identify randomized and quasi-randomized controlled trials comparing injected or oral iodine supplementation during preconception, pregnancy, or postpartum. Eleven trials with over 2700 women were included, all in settings with mild to moderate iodine deficiency. Iodine supplementation decreased the likelihood of postpartum hypothyroidism in the mother by 68% [average risk ratio (RR)=0.32, 95% CI, 0.11-0.91] and increased the likelihood of digestive intolerance in pregnancy 15 times (RR=15.33, 95% CI 2.07-113.70). There were no clear differences between groups for hypothyroidism in pregnancy or postpartum, preterm birth or maternal elevated thyroid peroxidase antibodies (TPO-ab) in pregnancy or postpartum, or hyperthyroidism in pregnancy. Infants who received iodine supplements had a 34% lower likelihood of perinatal mortality, however this difference was not statistically significant. All perinatal deaths occurred in one trial conducted in a severely iodine-deficient setting. There were no clear differences between groups for low birthweight, neonatal hypothyroidism/elevated thyroid-stimulating hormone (TSH), or elevated neonatal TPO-ab. There were insufficient data to reach meaningful conclusions on the benefits and harms of routine iodine supplementation of women; the evidence for the statistically significant outcomes was low or very low quality, and the number of trials was small. Additionally, the findings may not be applicable to settings with severe deficiency. More high-quality RCTs are needed; however, it may be unethical to compare iodine to placebo or in severe deficiency.


Knowledge about iodine in pregnant and lactating women in the Oslo area, Norway

Lack of knowledge about iodine may be a risk factor for iodine deficiency. The aim of this cross-sectional study was to assess the knowledge about iodine and identify predictors of knowledge scores among pregnant and lactating women, and to examine whether these scores were associated with iodine status. The study enrolled 804 pregnant and 175 lactating women (18–44 y) in the Oslo area, Norway. Knowledge about iodine was collected through a self-administered questionnaire. Iodine concentrations in urine and breast milk were measured using inductively coupled plasma mass spectrometry (ICPMS). 74% of the pregnant women and 55% of the lactating women achieved none to low iodine knowledge scores. Higher educated pregnant women and those who had received information about iodine had significantly higher scores. In lactating women, the knowledge scores improved with age. Overall, knowledge scores were not associated with iodine status. Public education initiatives are required to increase the awareness about iodine in these population groups.


Iodine status and iodized salt consumption in Portuguese school-aged children: the logenestation study

In Portugal, the use of iodized salt in school canteens has been mandatory since 2013. The present study aimed to evaluate iodine status in school-age children (6–12 years) and to monitor the use of iodized salt in school canteens. A total of 2018 participants were included in this cross-sectional survey in northern Portugal. Children’s urine and salt samples from households and school canteens were collected. A lifestyle questionnaire was completed by parents to assess the children’s eating frequency of iodine-rich foods. Urinary iodine concentration (UIC) was measured by inductively coupled plasma-mass spectrometry. The median UIC was 129 μg/L, which indicates adequate iodine status, but no school canteen had implemented the iodized salt policy, and only 2% of households were using iodized salt. Lower consumption of milk, but not fish, was associated with a higher risk of iodine deficiency. Implementation of iodine deficiency control policies should include a monitoring program aligned with the commitment of reducing the population salt intake.


Excessive iodine intake and thyrotoprin reference interval: Data from the Korean National Health and Nutrition Examination Survey

The sixth Korean National Health and Nutrition Examination Survey (2013-2015) is a nationwide, cross-sectional survey of the Korean general population. A total of 6,564 participants aged ≥10 years were selected using two-stage stratified cluster sampling of population and housing census data. The median urinary iodine concentration (UIC) was 299.3 μg/L (IQR, 158.8-699.8), suggesting more than adequate iodine intake in Korea. With high-iodine intake in all age groups and in both females and males, the TSH reference interval in the Korean reference population was right-shifted at 0.62-6.84 mIU/L. The prevalence of overt and subclinical hypothyroidism according to this interval was 0.73% and 3.12%, respectively, and was significantly associated with nutritional iodine status (p<0.001 and p<0.001, respectively). Nutritional iodine status might need to be considered when establishing TSH reference intervals of populations in iodine-replete areas.


Assessing the status of iodine deficiency disorder (IDD) and associated factors in Wolaita and Dawro zones school adolescents, southern Ethiopia

Iodine deficiency disorders (IDD) continue to affect a large proportion of the population of Ethiopia. This cross-sectional study assessed the prevalence of IDD in Wolaita and Dawuro zones. 718 high school and preparatory adolescent students in Wolaita and Dawuro zones were enrolled in April–May 2012. The total goiter rate was 48.9% (n=351). The rate of grade-1 goiter was 36.9% (n=265) and Grade-2 goiter was 11.9% (n=96). Factors significantly associated with goiter included being female [AOR = 3.526; 95% CI (2.55-4.87)], frequency of iodized salt use [AOR = 0.484; 95% CI (0.37-0.739)], and consumption of cassava [AOR = 4.184; 95% CI (2.6-6.707)]. The study revealed that iodine deficiency disorder was a serious public health concern. Therefore, emphasis on a sustainable iodine intervention program targeted at population level, particularly at females is mandatory. Nutrition education along with a well-implemented Universal Salt Iodization program are urgently required.