Salt iodization and salt reduction programs

Expanding collaboration and synchronizing strategies

An IGN and UNICEF policy brief for South Asia

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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.
South Asia policy brief

Salt iodization and salt reduction programs

Expanding collaboration, synchronizing strategies and sustaining improved health outcomes

• For decades, successful national salt iodization programs have been essential to preventing brain damage and other lifelong disabilities caused by iodine deficiency disorders (IDD). However, in South Asia, it is worrying that the attainment of sustained public health benefits of iodized salt is at risk due to gaps in quality and coverage of programs.

• Public health programs to reduce people’s salt intake aim at reducing sodium intake, a leading cause of high blood pressure (hypertension), heart disease, stroke and early death. Although hypertension is an increasingly significant factor associated with cardiovascular-related deaths in South Asia, only one out of eight countries has established a mandatory sodium reduction policy.

• Salt iodization and salt reduction are two cost-effective public health strategies that should go hand in hand. However, misalignment due to insufficient integration of programs, unclear institutional mandates and responsibilities and lack of consultation may contribute to the misconception that salt iodization and salt reduction programs are at odds.

• South Asian policymakers, academics, civil society and the region’s food industries have a golden opportunity to improve and save lives by creating synergies between salt iodization and salt reduction programs. Policy integration, consistent public messaging, reformulation of processed food, improvements to overall food environments and monitoring are essential to ensure that salt iodization efforts are sustained alongside salt reduction strategies.

1. Bridging salt iodization with salt reduction programs

The World Health Organization (WHO) recommends that all salt used in households and for food processing should be fortified with iodine as a safe and effective strategy for the prevention of IDD. The worldwide effort to make universal salt iodization mandatory has dramatically raised the proportion of households consuming iodized salt from less than 20% in 1990 to 89% in 2021 globally and 89.7% in South Asia. As a result, millions of children have been saved from a major cause of permanent brain damage and other lifelong disabilities.

WHO recommends a sodium intake of less than 2 grams per day (equivalent to just under 5 grams or a teaspoon of salt). However, the global average intake of sodium is more than twice the recommended level. Excess sodium consumption is a major cause of high blood pressure and is a main risk factor for cardiovascular diseases such as heart attack and stroke. Some 1.89 million deaths globally each year are associated with excessive sodium intake. The importance of reducing sodium intake is reflected in the global non communicable disease (NCD) target of a 30% relative reduction in sodium intake by 2025.

It is important to note that the iodine level in salt can easily be adapted to ensure adequate iodine intake while simultaneously reducing salt consumption – perfectly enabling both critical public health objectives.

2. **The use of iodized salt in processed food: A key entry point for alignment and synergy**

All South Asian countries have made commitments towards the prevention of IDD, and, except for the Maldives, all have mandated salt iodization and incorporating iodine nutrition into national policies, strategies and programs. As a result, iodized table salt is generally available and widely used in households. However, increasingly, home-cooked meals – an important source of iodine – are being replaced by processed food.

WHO uses nutrient profiling as a scientific method to categorize food and beverages based on their nutritional composition, which, broadly speaking, depends on whether they are part of a healthy diet or if they contribute to excess consumption of energy, saturated fats, trans fats, salt or sugar. Ultra-processed foods are particularly concerning because they are high in fat, salt, and sugar (HFSS) and low in proteins, vitamins, minerals and dietary fibre.

Over the past decade, there has been a rapid increase in the production and consumption of processed foods globally. In 2020, the global processed food industry was valued at US$1,925.7 billion and is projected to reach $3,407.2 billion by 2030. The expansion is particularly noticeable in low- and middle-income countries. In South Asia and elsewhere, this shift is driven by rising incomes, urbanization, and the growth of modern food retail. For consumers, processed foods represent convenience, have longer shelf life and are enticing because they tend to be cheap, hyper-palatable, and heavily marketed.

While Bangladesh, India and Sri Lanka have specified the mandatory use of iodized salt in processed food in their law, other countries have not made this requirement explicit, leaving room for interpretation and no action. Findings of an initial review by the Iodine Global Network (IGN) and the United Nations Children’s Fund (UNICEF) Regional Office for South Asia (ROSA) reveal that, in practice, there is little enforcement and inspection of the type of salt in processed foods that are manufactured, exported or imported across South Asian countries, even in countries where the use of iodized salt in processed food is mandated (see Table 1).

The examples of processed food items that were evaluated in this multi-country study are also those that are targeted for salt reduction and can be reformulated so they become healthier options. By ensuring that the salt used in their production is always iodized and reducing the amount of salt, both goals can be served at the same time.

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3. Synergies between salt iodization and salt reduction programs

3.1 Amplifying results through comprehensive “best buy” interventions

WHO refers to both salt iodization and salt intake reduction as brilliant examples of “best buys”: cost-effective, evidence-based public health strategies aimed at reducing risk factors and healthcare costs associated with NCDs. The long-term impact of these interventions on national economies and healthcare systems is undeniable:

- Global coverage of iodine consumption through salt iodization ensures the improvement in children’s cognitive development. In terms of future earnings, the potential global economic benefit is estimated to be nearly US$33 billion.

- Every dollar invested in sodium reduction brings an estimated return on investment of US$13-78, and reducing the global average sodium intake to the WHO-recommended limit of 2 grams per day could prevent at least 3 million premature deaths.5

Despite the overwhelming evidence to support the profound impact that salt reduction can have on public health outcomes, six out of eight South Asian countries achieved the lowest scores in implementing these WHO-recommended interventions to reduce salt intake – and one country could not be rated due to the lack of information (see Table 2).

Strengthening the implementation of salt reduction policies while sustaining public health gains achieved through salt iodization requires a comprehensive approach. For example:

Table 1: Status of implementation of the use of iodized salt in processed food in South Asia

<table>
<thead>
<tr>
<th>Category of processed food targeted for reformulation</th>
<th>Afganistan</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>India</th>
<th>Maldives</th>
<th>Nepal</th>
<th>Pakistan</th>
<th>Sri Lanka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread products (e.g., biscuits, cakes, pastries)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Dairy products (e.g., butter, buttermilk, cheese)</td>
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<td></td>
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<tr>
<td>Savoury snacks (e.g., crackers, nuts, potato/maize chips)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Ready-made meals (e.g., composite and convenience foods)</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Frozen foods (e.g., fish, meat)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Condiments (e.g., dressings, sauces)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (e.g., dried fruit)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- Use of iodized salt in salt-containing processed food is mandated by legislation
- Use of iodized salt in processed food is not explicitly mentioned in legislation, but importation and distribution allow only iodized salt
- No existing legislation on the use of iodized salt in processed food
- Processed food evaluated contained only iodized salt
- Processed food evaluated predominantly used iodized salt
- Processed food evaluated contained only non-iodized salt
- The outcome of the evaluation unknown
- Category of processed food not widely available or consumed and excluded from the evaluation

Source: International Market Analysis Research and Consulting Group, Review of Regional Trade Standards Pertaining to Processed Foods (in which Iodised Salt is used) and Iodised Salt in South Asia.: IGN and UNICEF, 2020.

• **Raising public awareness** through mass media and targeted multi-channel education campaigns to engage individuals and encourage them to reduce their sodium intake is also an opportunity to educate individuals about the importance of using iodized salt to prevent IDD. A central message is: “Use less salt, but make sure it is iodized!” By including information about both iodine and sodium in these campaigns, consumers can make informed choices about salt consumption.

• Implementing policies within **public institutions and food service** settings to reduce sodium content in food served and sold in schools, hospitals, and other government institutions can, at the same time, ensure the use of iodized salt. This integrated approach ensures that individuals are getting sufficient iodine while also reducing sodium intake.

• Engaging the food industry to **reformulate products** to lower the levels of salt and ensure that all salt used in the manufacturing process is iodized. In countries where the use of only iodized salt in processed food is mandatory, the reformulation of products provides an opportunity for industry to confirm their compliance with legislation.

• Adopting **front-of-pack labelling** that includes information on sodium content can easily incorporate information on iodine content. This provides consumers with a more holistic understanding of the salt they are consuming and helps them to make informed choices about the salt content of food products.

3.2 Increasing impact through joint monitoring systems, surveys and surveillance

Government agencies and regulatory bodies are responsible for monitoring and enforcing standards in salt iodization and salt reduction. They may conduct inspections, collect samples, and audit manufacturers to ensure compliance with regulations related to iodine content and sodium levels in salt products.

Salt iodization programs require regular monitoring to reveal the current iodine levels of a population. Iodine status across a population may shift according to changes in how much salt people consume. Typically, the iodine level used in the salt iodization process is adjusted based on the population’s iodine status.

| Table 2: Status of key best-buy strategies in salt reduction across South Asia |
|--------------------------------------------------|-------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Afghanistan                                      | No    | No              | No              | No              | No              | No              | 1               |
| Bangladesh                                       | No    | No              | Voluntary       | No              | Mandatory       | 2               |
| Bhutan                                           | Voluntary | No              | No              | No              | No              | 2               |
| India                                            | Voluntary | No              | No              | No              | Mandatory       | 2               |
| Maldives                                         | No    | No              | No              | No              | No              | 1               |
| Nepal                                            | No    | No              | No              | No              | No              | 1               |
| Pakistan                                         |       |                 |                 |                 |                 |                 |
| Sri Lanka                                        | Voluntary | No              | No              | Mandatory       | Mandatory       | 3               |

**Legend:**

- **Score 1**: Commitment at policy level only
- **Score 2**: At least one voluntary policy has been established
- **Score 3**: At least one mandatory policy has been established, and sodium is declared on pre-packaged foods
- **Score 4**: At least two mandatory policies have been established; sodium is declared on pre-packaged foods; all WHO sodium-related best buys have been implemented

**Source:** World Health Organization, WHO global report on sodium intake reduction, WHO: 2023
A joint, cost-effective approach to monitoring could carry out surveys and surveillance that cover both levels of iodine in salt and iodine and sodium intake. Combined dietary surveys provide an evidence base to enable the adjustment of iodine concentrations in salt considering population sodium intake. A comprehensive public health strategy that integrates salt reduction and salt iodization programs is more likely to have robust data and evidence demonstrating the impact of their efforts.

3.3 Improving outcomes through better coordination

In addition to monitoring and data collection, there are many other important opportunities for better institutional coordination at the management level between the two programs:

- **Coordinated policies** related to salt iodization and salt reduction will enable governments to create a comprehensive and coherent national health strategy to address both issues. This approach ensures that the efforts of various government agencies and stakeholders – including the food industry – are coordinated and mutually reinforcing and will include establishing and enforcing salt iodization and salt reduction standards in processed foods.

- **Coordinated advocacy** and communication strategies will avoid conflicting messages and ensure clear and consistent information on the importance of sustaining optimal levels of iodine in salt and reducing sodium intake. Countries advocating for both salt reduction and salt iodization within a broader public health strategy demonstrate a comprehensive approach to achieving significant public health goals and a commitment to long-term health improvements.

- **Coordinated investment** will drive efforts of policy and program experts in salt iodization and sodium reduction – to identify common goals and synergies across health and food systems. Integrated programs can maximize the impact of their investment and resources, as the infrastructure and resources needed for one program can often be leveraged for another.

- **Joint coordination meetings** serve as a platform for communication, collaboration, and alignment among different stakeholders. They promote synergy, prevent duplication, and ultimately lead to more effective and efficient work, as well as the creation of stronger alliances to address common goals and challenges.

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6 Existing monitoring tools include, for example, WHO’s STEPwise approach to NCD risk factor surveillance (STEPS) is a simple, standardized method for collecting, analyzing and disseminating data on key NCD risk factors in countries. The survey instrument covers key behavioural risk factors: tobacco use, alcohol use, physical inactivity, unhealthy diet, as well as key biological risk factors: overweight and obesity, raised blood pressure, raised blood glucose, and abnormal blood lipids. Through the use of expanded modules, the survey instrument can be expanded to cover a range of topics beyond these risk factors, such as oral health, sexual health and road safety. ([https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/steps](https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/steps)).
4. Priorities and actions for policymakers, program managers, academia and the food industry

Programs promoting salt iodization and programs to reduce sodium intake should go hand in hand. IGN and UNICEF ROSA have identified four top priorities for South Asian policymakers, academics, and the region’s food industry.

4.1 Improve and sustain the collection and quality of data on salt iodization and salt reduction

The collection and quality of data on salt iodization and salt reduction inform decision-making, enable progress monitoring, target interventions, allow resources to be allocated effectively, facilitate international comparisons, hold government and other direct stakeholders accountable, support research and innovation and aid long-term planning for improved public health outcomes. High-quality data is timely, sufficiently disaggregated, reliable and consistent. The handling and sharing of data must comply with confidentiality and privacy rules.

**Governments** are urged to:
- Increase and sustain investments to produce high-quality data and improve the coordination of investments to avoid duplication and maximize synergies.
- Define priorities for data collection in national plans.
- Review and optimize national data collection systems in line with international standards.

**Academia** is urged to:
- Identify and expand opportunities to collect, optimize and diversify data collection.

4.2 Explore healthier reformulation of processed food

Reformulating processed foods to lower the salt content helps in reducing sodium intake, which is essential for preventing hypertension and related cardiovascular diseases. If processed foods contain non-iodized salt, reformulation provides an opportunity to use iodized salt so that the product is compliant with the country’s salt iodization policy. Collaboration between governments, the food industry, and health organizations is usually needed to implement effective salt reduction and iodization programs. Reformulation can be monitored and assessed over time to evaluate its impact on salt intake and iodine levels, and these findings can contribute to informed decision-making.

**Food producers and companies providing catering services** are urged to:
- Adopt recommended nutrition labelling to indicate levels of sodium and iodine contained in the food product.
- Review their product portfolio and reduce salt in products containing excessive amounts of sodium.
- Adhere to government policies on reducing salt intake and ensuring the use of iodized salt in processed food.
- In institutional feeding programs such as school feeding, provide reduced salt content in meals and ensure iodized salt is provided in these services.
- Use social safety net programs to inform participants about salt reduction and salt iodization, and when commodities are provided, ensure low salt content and iodized salt.
- Provide information on salt iodization and salt reduction to students, consumers, and participants of social safety net programs.
4.3 Create greater stakeholder awareness on salt iodization and salt reduction

Informed stakeholders are better equipped to support effective policies, leading to more successful policy implementation and enforcement. Greater awareness fosters transparency in government and industry practices related to salt iodization and salt reduction.

Governments are urged to:
- Strengthen regulatory enforcement systems and ensure all stakeholders (including health professionals) are kept informed about new data.
- Establish or strengthen effective national multisectoral and multistakeholder governing bodies responsible for program planning linked to salt iodization and salt reduction.
- Promote and facilitate dialogue and cooperation among a broad range of relevant stakeholders at the national and subnational levels.
- Include salt iodization and salt reduction provisions in school curricula and in the professional education of health and medical staff.

Academia is urged to:
- Work with national and international training institutions to create and promote e-learning and ongoing education on applying data related to salt iodization and salt reduction.
- Support the government to regularly produce and disseminate user-friendly data that will facilitate decision-making.

Governments are urged to:
- Establish a joint commission to secure stakeholder cooperation and standardize data collection.
- Disseminate data to support policy and research purposes.
- Promote the use and integration of salt iodization and salt reduction data generated by the private sector, communities, civil society organizations and other sources.

Academia is urged to:
- Design and innovate analytic models and data collection approaches relevant to salt iodization and salt consumption.
- Develop technology and refine tools that streamline and simplify data collection while improving data quality.

4.4 Increase collaboration and harmonization to improve and promote collecting and sharing data on salt iodization and salt reduction

Increased collaboration among stakeholders to harmonize methods, improve data quality, and share data for the public good contributes to more accurate, comprehensive, and reliable information. It supports better decision-making, innovation, and the collective effort to address complex issues.

Acknowledgment

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Improving and sustaining iodine nutrition in the Middle East and North Africa (MENA)

Mohammed Mansour, Izzeldin Hussein, Mathilde Maurel, Arnold Timmer, Wigdan Madani, Joyce Greene, and Werner Schultink

Editor’s note

To contribute to sustainable elimination of iodine deficiency in the MENA region, UNICEF and IGN conducted a landscape analysis of salt iodization programs and iodine nutrition which covered 20 countries, as well as in-depth analyses of four countries, Egypt, Iraq, Lebanon and Sudan. This article reviews some of the findings of the landscape analysis as well as of subsequent discussions aimed at revitalizing action to improve iodine nutrition in the region.

Background

Before the introduction of salt iodization, iodine deficiency was widespread in MENA. National goiter and iodine deficiency prevalence data from the 1960s onwards built the evidence for adopting the strategy of salt iodization to address the problem. Salt iodization became mandatory in 17 countries; Saudi Arabia and Libya have voluntary iodization, while in Sudan, legislation is at state rather than national level. USI and IDD elimination goals were incorporated in policies, strategies and plans of action in 15 countries.

Most countries have established multi-sectoral oversight and coordination mechanisms, the majority vertical, stand-alone programs, generally under Ministry of Health nutrition divisions, sometimes in collaboration with other ministries or government agencies. Engagement with the salt industry, promotion of public-private partnerships and activities to raise awareness and promote use of iodized salt were implemented.

Figure 1. Coverage of household iodized salt (any iodine) 1

[Figure showing salt iodization coverage in various countries]

1 Recent surveys have been conducted in Syria, Lebanon and Yemen. Results of these surveys have not been released yet, however.
Over the past 20 years, these initiatives have led to significant progress. Figure 1 shows 10 countries where the proportion of households consuming iodized salt (any iodine > 0 ppm) is above 90%, 6 countries between 70 to 90%, and in only two countries (Sudan and Djibouti), the access to iodized salt is less than 15% of households.

Iodine status

Iodine status (largely documented by mUIC in school age children) marked improved and goiter prevalence declined.

Based on this status indicator, we can capture progress as follows: 14 countries have optimal iodine status (mUIC >100 to <300 µg/L); two – Djibouti and Qatar – have “above adequate” status (>300 µg/L), and three countries are iodine deficient: Libya (90 µg/L), Iraq (84 µg/L) and Lebanon (66 µg/L). It should be noted that inequities exist and several countries have sub-national regions with iodine deficiency. Of the 11 countries with sub-national data (by region for school-age children), 3 countries (Iraq, Morocco and Yemen) have regions where children are iodine deficient (<100µg/L).

Today’s context and challenges

Despite these substantial achievements, no country in the region has met all the criteria and programmatic indicators for sustainable elimination of IDD as a public health problem (WHO, ICCIDD, UNICEF (2007) Assessment of the Iodine Deficiency Disorders and Monitoring Their Elimination, 3rd Edition). The landscape analysis was initiated to understand the current reasons for this lack of progress and to identify actions required to achieve further progress where needed. Following its completion, UNICEF and IGN held a workshop in Jordan in January 2023 with government, UNICEF and IGN representation from Sudan, Iraq, Egypt and Lebanon to disseminate and discuss the findings of the landscape analysis, and to develop an action plan.

Data quality and equity

Equitable access to iodized salt is essential to ensure iodine sufficiency for all. Population-based surveys provide national averages that often hide disparities at subnational and subgroup level. In countries with national averages of 70% to 90% household coverage of iodized salt, there may still be large inequities between regions and population sub-groups.

In 12 countries, disaggregated data exist for both indicators, in 2 country only for HHIS, and in 3 countries only for mUIC. 3 countries lack disaggregated data on HHIS and mUIC. Of the 15 countries with disaggregated data, two have no significant differences between subgroups (Iran and UAE). All other countries show significant variations in one or more subgroups. The most frequent disparities are found at sub-national level and by place of residence (urban/rural), followed in order by wealth, demographic and educational sub-groups. Collecting this data is critical to achieving equity.

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2 Iodine status in Djibouti is likely sufficient without salt iodization due to iodine content in water.
70% of countries have data older than 5 years for household coverage of iodized salt and 85% have iodine status data more than 5 years old. It should be noted that new data is expected for 3 countries (Yemen, Syria and Lebanon). Disaggregated data for sub-national regions and population groups is limited (see Table 1). Available data has insufficient granularity for effective monitoring and evaluation. Program monitoring and iodine surveys should be more geared towards provision of relevant information to help identify program challenges and address equity and sustainability of the program as a whole.

**Program monitoring and surveillance**

National iodine nutrition policies initiated 15 to 20 years ago no longer reflect the epidemiologic, economic and food consumption patterns of their populations. Many governance bodies established then tasked with iodine oversight, have become less active or ceased to function, as in the case of Algeria, Bahrain, Egypt, Jordan, Kuwait, Syria, Tunisia, and Yemen. In Kuwait, regular monitoring of salt imports was discontinued, and the USI program ceased to exist. Similarly, in Tunisia, program management discontinued, the budget was cut, and multi-sectoral coordination stopped.

Table 1: Disaggregated data for iodine status and iodized salt coverage

<table>
<thead>
<tr>
<th>Country</th>
<th>MUIC disaggregation</th>
<th>HHIS disaggregation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>Region</td>
<td>Region*</td>
</tr>
<tr>
<td>Bahrain</td>
<td>Region</td>
<td></td>
</tr>
<tr>
<td>Djibouti</td>
<td>Sub group</td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>Region &amp; Sub group</td>
<td>Region &amp; Sub group</td>
</tr>
<tr>
<td>Iran</td>
<td>Region &amp; Sub group</td>
<td>Region</td>
</tr>
<tr>
<td>Iraq</td>
<td>Region &amp; Sub group</td>
<td>Region &amp; Sub group</td>
</tr>
<tr>
<td>Jordan</td>
<td>Region</td>
<td>Region</td>
</tr>
<tr>
<td>KSA</td>
<td>Region</td>
<td>Region*</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Sub group</td>
<td>Wealth</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Sub group</td>
<td>Region</td>
</tr>
</tbody>
</table>

+ Difference between region or wealth comprise between 15 and 67%
* Iodine deficient (<100µg/g for SAC & WRA and <150µg/L PW)
Regulatory monitoring and enforcement is weak in several countries, mainly due to unclear definition of roles and responsibilities of regulating agencies, poor coordination, insufficient resources and program fatigue. Furthermore, instability and conflict have impacted the situation in several countries.

The landscape analysis was hindered by absence of information on different program domains. In most countries regular program monitoring is absent, and there is a lack of information on the factors influencing the performance of the salt iodization program, such as iodized salt supply information, results from enforcement activities, advocacy and awareness raising, and status of any interventions to address program challenges. As a result, the only information on program performance is available from national surveys, which are relatively costly, implemented irregularly, and mostly do not provide more in-depth insight on how to improve the program.

Routine monitoring of salt iodine content at factory, market and household level is systematic only in Iran and Tunisia. Most countries’ data on household use of iodized salt (with any iodine) comes from national surveys. We reviewed data from 2010 to 2021 and most countries (11) used quantitative assessment (titration) which enables the assessment of the quality of iodization. The remainder (9 countries) used rapid test kits (RTK) therefore only indicating the presence of iodine in salt but not the amount. Only two countries used market-based data to determine the iodized salt supply situation.

Regarding iodine status, the most recent assessment through measurement of urinary iodine (covering 2012 to 2021) was done through national surveys (17 countries), while in 3 countries, data was collected through facility or program-based surveillance (Jordan, Iraq and Algeria).

(Iodized) salt supply

The region has six large salt producing countries (Egypt, KSA, Iran, Djibouti, Morocco, Tunisia) with a great potential for export to other countries in the region and worldwide. Total salt production is estimated roughly at 17 million metric tons annually, of which 93% comes from these 6 countries.

The remaining countries are self-producers (Algeria, Sudan, Iraq, Syria, Yemen, Libya, and Jordan) or importing countries (Lebanon, Bahrain, Qatar, UAE, Kuwait, SOP and Oman).

Despite the potential of intra-regional salt trade, there is a complete lack of information regarding trade of iodized salt in the region. National statistics regarding the different uses of salt are not available. An in-depth assessment of trade barriers and facilitators is needed to promote regional trade and design and implement adequate intra-regional facilitation initiatives.

There is a large discrepancy in salt and iodization standards between countries, which could potentially affect trade, since iodization levels would need adaptation when exported to a country with a different iodization standard. There was limited information on the current trade and further detailed assessment would be needed to determine the flow of salt.

The use of iodized salt in processed foods

Generally, salt iodization in processed foods is described in national legislation, sometimes explicitly and sometimes referred to under ‘all salt for human consumption’. Mandatory iodization of food industry salt is explicit or implied in 12 countries (Bahrain, Egypt, KSA, Kuwait, Morocco, Oman, SOP, Qatar, Sudan, Tunisia, UAE, Yemen), and not specified in the rest of the countries.
With the increased and regular consumption of processed foods, the salt used in these products becomes potentially an important source of iodine, as compared to table salt, when iodized salt is actually used. Therefore, it is becoming important to know which are the commonly consumed salt-containing products and whether the salt used is iodized. This information is not available for most countries in the region.

Salt iodization and salt reduction

With most countries implementing national initiatives and strategies to reduce salt intake, there is a need to align the salt iodization and reduction strategies. Salt iodization and salt reduction are two cost-effective public health programs that should go hand in hand. However, misalignment due to insufficient integration, unclear mandate responsibilities and lack of consultation have contributed to an entirely false narrative suggesting salt iodization and salt reduction are at odds.

Figure 3: Status of salt reduction program in the region (WHO global report on sodium intake reduction, WHO, 2023)

<table>
<thead>
<tr>
<th>Country</th>
<th>Overall score</th>
<th>Declaration of sodium</th>
<th>Reformulation</th>
<th>Public food procurement and service</th>
<th>Front-of-pack labelling</th>
<th>Mass media campaigns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>2</td>
<td>Mandatory</td>
<td></td>
<td></td>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Bahrain</td>
<td>3</td>
<td>Mandatory</td>
<td>Mandatory</td>
<td>Mandatory</td>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Djibouti</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Iran</td>
<td>3</td>
<td>Mandatory</td>
<td>Mandatory</td>
<td></td>
<td>Mandatory</td>
<td>Voluntary</td>
</tr>
<tr>
<td>Iraq</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Jordan</td>
<td>1</td>
<td></td>
<td>Mandatory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KSA</td>
<td>4</td>
<td>Mandatory</td>
<td>Mandatory</td>
<td>Mandatory</td>
<td>Voluntary</td>
<td>Voluntary</td>
</tr>
<tr>
<td>Kuwait</td>
<td>2</td>
<td>Mandatory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Libya</td>
<td>No data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Oman</td>
<td>2</td>
<td></td>
<td>Mandatory</td>
<td></td>
<td></td>
<td>Voluntary</td>
</tr>
<tr>
<td>Qatar</td>
<td>3</td>
<td>Mandatory</td>
<td>Voluntary</td>
<td>Mandatory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State of Palestine</td>
<td>No data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sudan</td>
<td>No data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syria</td>
<td>No data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tunisia</td>
<td>2</td>
<td></td>
<td>Voluntary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UAE</td>
<td>2</td>
<td>Mandatory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yemen</td>
<td>No data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- **Score 1**: Commitment at policy level only
- **Score 2**: At least one voluntary policy has been established
- **Score 3**: At least one mandatory policy has been established, and sodium is declared on pre-packaged foods
- **Score 4**: At least two mandatory policies have been established; sodium is declared on pre-packaged foods; all WHO sodium related best buys have been implemented
Recommendations

The landscape has changed drastically since the strong push for salt iodization and impressive scale up in the 1990s and 2000s, with less resources and lower prioritization of iodine nutrition on national agendas. It is important however that the progress made on salt iodization is not reversed, and that the situation of deficient populations is improved.

The following actions are recommended.

It is important to strengthen advocacy efforts to keep iodization on the agenda of policy makers who should be provided with relevant information so that they can decide on program management, funding and corrective actions. It is important to integrate salt iodization in the broader nutrition strategy and plans and link up with other fortification efforts.

Linked with this is the need for active and sustainable monitoring of iodine programs. Information obtained from national surveys is often the only feedback to help steer direction and corrective action. It is important to agree on regularly collecting a minimum set of information that is needed, using program-based information sources such as supply information, market monitoring, regulatory monitoring, or data collection on household consumption and iodine status using a sentinel approach. As stated before, national surveys are not necessarily the best program management tool and therefore, when feasible, surveillance systems that provide targeted information from a limited number of carefully selected sites.

Countries are encouraged to find out (if not known already) which commonly consumed processed foods can, or already do, contribute to the iodine intake if iodized salt is used in the manufacturing of these foods, especially for areas and population groups that currently are iodine deficient and do not have access to iodized table salt.

Coordinate salt reduction and salt iodization efforts. The following three areas of action may be relevant in the region:

• Coordinated policies related to salt iodization and salt reduction will enable governments to create a comprehensive and coherent national health strategy to address both issues. This approach ensures that the efforts of various government agencies and stakeholders – including the food industry – are mutually reinforcing and will include establishing and enforcing salt iodization and salt reduction standards in processed foods.

• Increasing impact through joint monitoring systems, surveys and surveillance: Government agencies and regulatory bodies are responsible for monitoring and enforcing standards in salt iodization and salt reduction. They may conduct inspections, collect samples, and audit manufacturers to ensure compliance with regulations related to iodine content and sodium levels in salt products.

• Engaging the food industry to reformulate products to contain lower levels of salt can also include using iodized salt in their products to contribute to iodine intake. In countries where the use of only iodized salt in processed food is mandatory, the reformulation of products provides an opportunity for industry to ensure compliance with legislation.

Regular regional situation review through regional coordination, possibly supported and convened by UNICEF/WHO/WFP. A regional platform for coordination, networking, ensuring availability of technical support and situation overview is potentially a key mechanism to sustain programs and address challenges in systematic manner. Such mechanism presently does not exist in the MENA region.

During the regional workshop, UNICEF and IGN agreed to support four core countries, Egypt, Iraq, Lebanon and Sudan. Technical and multi-purpose assistance is recommended to deliver to other countries in the region in accordance with the country classification-based priorities and goals.

We would like to extend our thanks and appreciation to IGN’s National Coordinators in the region, who helped to develop this landscape analysis.
Review of iodine nutrition in South America: transitioning to sustained optimal iodine nutrition in a new global context

Ana Maria Higa and Rocio Galvez-Davila

Editor’s note

This study of the situation on iodine nutrition programs in South America was produced using a tool to assess performance and sustainability of Universal Salt Iodization (USI) and Iodine Deficiency Disorders (IDD) prevention programs, designed by IGN. The tool is a questionnaire through which the quality of a national salt iodization program is systematically assessed. The questionnaire focuses on 5 domains: legislation, program management, salt supply, advocacy & awareness, coverage & impact. The tool is for program managers, and its yearly use will give them insight into program performance, and to identify weaknesses in need of strengthening. It is being tested in countries with support from the Bill & Melinda Gates Foundation.

About the study

During 2022 and 2023, amid challenging circumstances, where health systems in the region were recovering from the COVID-19 pandemic and its consequences on health, social and economic institutions, IGN in South America advocated for the use of data already available in countries to assess the performance of USI and IDD control programs, the level of iodine intake. As well as the program performance assessment tool, a pilot study was conducted to estimate the contribution of iodized salt in processed foods to daily iodine requirements in preschool children in Peru using quantitative cross-sectional secondary data analysis of processed foods consumed and sodium databases.
Brief history of the efforts to address iodine deficiency in South America

1980-90s: Thanks to national programs and support from international development agencies, most Andean countries, Ecuador, Bolivia, Peru, Venezuela, and Colombia initiate national programs.

2000-2015: Goals aimed at controlling IDD are achieved by most countries. IGN organized a regional workshop to analyze the situation. Most South American countries developed monitoring and evaluation strategies as part of regular government plans.

2015-2019: Monitoring of salt iodization diminishes. Some countries conduct national studies of iodine status and modify levels of iodine in salt.

2020-2022: By 2021, most South American countries show sufficient iodine intake as a national average. The COVID-19 pandemic limits resources and actions for monitoring, which are now being reactivated.

Methods

Secondary data from 12 countries was analyzed. Indicators that measure direct use of iodized salt were used: iodized salt intake per capita, (from GFDx platform), percentage of households using iodized salt, (UNICEF Database and Demographic and Health Surveys) and urinary iodine concentration (National IDD program surveys and IGN Global Scorecard). The study also included Ministries of Health websites and publications, countries’ open data repositories, peer-reviewed journals, and personal communication between IGN regional and national coordinators and program managers from Ministries.

Following guidelines adapted from WHO and IGN recommendations, dietary information in 24-hour recalls from national population surveys was used to identify key salt-containing processed foods consumed by children 0-35 months of age, and sodium databases to estimate their iodine content. Adjustment of sodium from sources other than iodized salt in processed foods, level of iodization and losses were taken into consideration for calculations.

Findings

Domain 1: Legislation, regulation and enforcement

Almost all countries had USI/IDD control legislation and regulations except for Suriname and Guyana. Six of twelve countries made efforts to update and adapt regulations in the last decade. These changes usually involve modification of iodization levels, inclusion, or exclusion of foodstuffs in the regulation, and inclusion of processed foods.

Figure 1: Iodine intake in school children, South America 2021

<table>
<thead>
<tr>
<th>Insufficient</th>
<th>Adequate</th>
<th>Excess</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median UIC &lt;100 µg/L</td>
<td>Median UIC 100-299 µg/L</td>
<td>Median UIC &gt; 300 µg/L</td>
</tr>
<tr>
<td>National data</td>
<td>0 (w:18)</td>
<td>8 (w:105)</td>
</tr>
<tr>
<td>Sub-national data</td>
<td>0 (w:3)</td>
<td>1 (w:13)</td>
</tr>
<tr>
<td>No recent data</td>
<td>3 (w:42)</td>
<td>0</td>
</tr>
</tbody>
</table>

At this time, MOH from Chile is implementing a new multi-step regulation that adjusts salt iodization range to 0.015 g/kg – 0.025 g/kg, through the Supreme Decree No. 70 amending Supreme Decree No. 977 of 1996, Food Health Regulations, whose transitory article No. 1 indicates that entry into force will be 18 months after its publication in the Official Gazette (November 11, 2022). The adaptation will be carried out gradually (Concentration range of iodine in salt (g iodine/kg salt) should be within the range 0.015-0.040 g/kg by March 2024 and 0.015-0.025 g/kg by May 2025. The same multi-step process is proposed in the new regulation for Colombia.

Table 1: Salt iodization legislation in South American countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Start of iodization (any amount)</th>
<th>Year of introduction of iodization legislation</th>
<th>Start of IDD program</th>
<th>Current iodization levels ppm</th>
<th>Includes salt in processed foods?</th>
<th>Year of legislation</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolivia</td>
<td>1944</td>
<td>1968</td>
<td>1984</td>
<td>40-80</td>
<td>Yes</td>
<td>2013</td>
<td>Supreme decree 08338 and norm No. 328004. Technical regulation for salt fortification</td>
</tr>
<tr>
<td>Chile</td>
<td>1959</td>
<td>1959</td>
<td>1979</td>
<td>15-25</td>
<td>Yes</td>
<td>2022</td>
<td>Decree No. 70 Health. New iodization levels are 15-25 ppm (to be implemented in phases by 2025)</td>
</tr>
<tr>
<td>Colombia</td>
<td>1947</td>
<td>1955</td>
<td>1984</td>
<td>(50-100) 20-40*</td>
<td>Yes</td>
<td>(1996) 2023*</td>
<td>Decree 547; packaging, expenditure and control of human grade salt</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1959</td>
<td>1968</td>
<td>1968</td>
<td>20-40</td>
<td>Yes</td>
<td>2010</td>
<td>Executive decree No. 4013. Regulations for salt iodization law</td>
</tr>
<tr>
<td>Suriname</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uruguay</td>
<td>1953</td>
<td>1961</td>
<td>1971</td>
<td>20-40</td>
<td>No</td>
<td>2000</td>
<td>All direct and indirect human grade salt must be iodized</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1966</td>
<td>1968</td>
<td>1976</td>
<td>40-70</td>
<td>Not explicit</td>
<td>2020</td>
<td>Prohibition of salt shakers / table salt in any presentation in businesses where food is sold unless requested by patrons</td>
</tr>
</tbody>
</table>

*Colombia’s Government is ready to sign the new decree which establishes the new iodization level at 20-40ppm.

Domain 2: Policy, program management and coordination

All countries except for Guyana and Suriname have developed successful programs to address iodine deficiency, conducted by the Ministries of Health. By 2010 iodine programs were integrated as components in micronutrient or nutrition programs.
Later, each country institutionalized their efforts, adapting USI strategy to their needs, characteristics, and resources. Some countries maintained national coordination committees, (Brazil, Colombia, Ecuador, Paraguay), others have micronutrient coordination committees on an as-needed basis (Peru) or even committees within autonomous regional governments (Bolivia). Argentina has not had an official national coordination committee, although iodine strategies were carried out by FASEN Argentine Federation of Endocrinology Societies, with the support of IGN and the active leadership of CNIN-National Center for Nutritional Research, a governmental agency focusing on the northwestern region of the country where population at higher risk of iodine deficiency reside.

The pandemic halted resources for these initiatives in all countries, although they are presently being resumed. IGN Coordination for South America is corroborating the information gathered regarding program organization with program managers.

**Domain 3: Supply**

Even though there are internal reports, these are not made public. Despite reduced participation in some countries since programs were first organized, producers have a presence at national negotiation tables and technical committees in countries like Brazil, Colombia, and Peru.

**Participation of salt producers in IDD/USI programs**

Salt producers and those in the food industry still participate in discussions and decision-making processes regarding iodized salt (such as in Brazil and Colombia) with the most recent modifications to regulations, although their involvement with IDD control programs has decreased especially since 2015.

**Performance of small producers**

Small scale salt production is progressively consolidating as in the case of Peru and Bolivia. These small scale producers provide iodized salt for about 20 million people and ensure the quality of their product remains relevant.

Needs for technical assistance were identified to maintain ongoing interventions. Focusing on small producers from northwest Argentina, Salta and Jujuy, who provide iodized salt to other 6 provinces, would benefit 10 million inhabitants, about 20% of the Argentinian population. Here, although the amount of non-iodized salt is decreasing, improvement of fortification quality is slower compared to the region.

Most countries have monitoring systems for fortified products in place, including iodized salt, although dissemination of the outcomes is scarce and quantitative information of any aspect of the production process is difficult to access. Technical assistance from IGN to producers during 2022-2023 has produced data and ought to be maintained. Most countries ensure sufficient volume of iodized salt for the entire population, however, there are some concerns about the quality of fortification levels as discussed in Domain 5.
**Domain 4: Advocacy and awareness**

Public and private institutions in South American countries, from Ministries of Health to salt producers and academic organizations, have made efforts to promote awareness of iodine nutrition and its monitoring through creative initiatives. We learnt about FASEN, creating “the Ways of Iodine” project which they disseminate through social networks. Or that in Bolivia, in 2022, iodized milk for pregnant women was distributed in rural areas, a strategy that was accompanied by radio spots in the native language (Aymara) that explained the importance of iodine intake during pregnancy, and articles in local newspapers. In Ecuador, Ecuasal, the major iodized salt producer, presented in 2021 a promotional video highlighting the iodization regulations they comply with. The video is accessible online and was streamed on national TV at the time. In Peru and Bolivia IGN, in partnership with the Regional Health Government of Cusco and Oruro respectively, produced, and shared Iodine Communication Sets consisting of multimedia materials to train program managers, health workers and the general public on iodine nutrition. These include banners, jingles, videos and informative flyers in Spanish, Quechua and English. A detailed list of advocacy initiatives in South America with links to their websites, as well as the Communication packages for Iodine Nutrition can be found in the link at the foot of this article.

**Domain 5: Program outcomes and quantitative Information from indicators**

This domain covers USI program outputs, the quantitative information of USI indicators.

**Monitoring of iodized salt**

Most south American countries officially support strategies for salt/sodium intake reduction and include them in programs for the prevention of noncommunicable diseases (NCDs). For the period 2015-2023, 5 countries had available quantitative information on salt intake per capita, and 3 had information about salt use in households. All countries should update these indicators to support both efforts to reduce sodium intake and sustain iodine nutrition, especially in vulnerable groups.

**Table 2: Latest advocacy and awareness efforts in South America for iodine nutrition**

<table>
<thead>
<tr>
<th>Country</th>
<th>National Salt Intake per capita</th>
<th>Households consuming iodized salt (&gt;0 ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intake per capita g/d</td>
<td>Year of Data</td>
</tr>
<tr>
<td>Argentina</td>
<td>11</td>
<td>2015</td>
</tr>
<tr>
<td>Bolivia</td>
<td>9.1</td>
<td>2010</td>
</tr>
<tr>
<td>Brazil</td>
<td>9</td>
<td>2013</td>
</tr>
<tr>
<td>Chile</td>
<td>9.3</td>
<td>2017</td>
</tr>
<tr>
<td>Colombia</td>
<td>18</td>
<td>2015</td>
</tr>
<tr>
<td>Ecuador</td>
<td>7.7</td>
<td>2010</td>
</tr>
<tr>
<td>Guyana</td>
<td>6.2</td>
<td>2010</td>
</tr>
<tr>
<td>Paraguay</td>
<td>13</td>
<td>2015</td>
</tr>
<tr>
<td>Peru</td>
<td>7.8</td>
<td>2019</td>
</tr>
<tr>
<td>Suriname</td>
<td>7.3</td>
<td>2010</td>
</tr>
<tr>
<td>Uruguay</td>
<td>6.9</td>
<td>2010</td>
</tr>
<tr>
<td>Venezuela</td>
<td>9</td>
<td>2010</td>
</tr>
</tbody>
</table>

* Market Surveys
Table 3, with the detailed updated information for these indicators, can be accessed in the link at the end.

During the COVID-19 pandemic, monitoring efforts decreased in all countries, although some assessed the pandemic’s impact on iodized salt access and availability. In Argentina, it was found that in 2020, 2021 and 2022 the iodine level varied both in national and regional salt, suitable salts were 59.3%, 29.2% and 41.9% respectively. It was concluded that in the COVID-19 health context, the iodine content in salt for the consumer decreased markedly compared to the situation pre-pandemic. This should alert governments about the effects of emerging infectious diseases (EIDs) on nutrition programs and essential micronutrient availability for target populations.

**Median Urinary Iodine Concentration**

Most countries report adequate iodine nutrition nationally. However, when comparing sub-national data, crucial differences in intake are reported. Local studies in pregnant women in Salta, Cobija and São Paulo showed median urinary iodine concentrations below 150 mcg/L. These findings highlight urgent need for interventions.

**Iodized salt in processed foods consumed by preschool children in Peru**

Children under nine months of age living in both urban and rural areas, during the weaning period were most at risk of not reaching daily iodine requirements. Estimated total iodine intake for this group did not reach 70 mcg daily, below the minimum recommended standard I of 90 mcg). Children in rural areas had the least intake of iodized salt from processed food. IGN Coordination for South America is working with National Coordinators to continue this analysis with data from other countries in the region.

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**Figure 2: Median Urinary Iodine Concentration (μg/L) in children of school age and pregnant women in South America by country**

**Median Urinary Iodine Concentration (μg/L) in children of school age in South America, per country**

**Median Urinary Iodine Concentration in pregnant and reproductive-age women from target populations in South America**
The use of the Program Evaluation Worksheet helped organize, highlight, and analyze relevant information, identify information gaps, monitor surveillance, and promote uniformity, allowing comparative analysis. The tool could facilitate dialogue with local and central governments. The information collected and organized in the worksheets can be used as a baseline for information goals for the year 2030.

Conclusions

Coverage of USI in each country is mostly universal with percentages of at least 86% of households, except for Suriname, Guyana, and Venezuela, where target populations would benefit from efforts to increase household coverage with adequately iodized salt and periodic evaluation.

For eight countries the data for the indicator “Households consuming iodized salt” has not been updated since at least 2014 or has not been reported.

In most cases, the presence of iodized salt in the household was examined with a qualitative kit. It is recommended that countries ensure accurate quantitative monitoring of iodization levels. For this, availability of laboratories with adequate supplies not only in government centers but in decentralized locations is recommended.

To estimate salt intake per capita, reports usually relied on methods that could overestimate the intake of salt or iodine, due to sodium being used in other additives as well.

Roles and responsibilities are adequately regulated in most countries, however stakeholders report lack of clarity of these roles in day-to-day activities of the departments involved.

Information on indicators that help evaluate IDD and USI programs are produced periodically, although reports are seldom disseminated.

IGN Coordination for South America encourages the use of data hubs such as the platform GFDx (https://fortificationdata.org/), or UNICEF Iodine Nutrition database (https://data.unicef.org/topic/nutrition/iodine/) and monitoring the need for updates. Reporting and sharing information improve teamwork in the continent.

Information about iodine nutrition was well received by health providers, the general population, and retailers. There is a demand for this knowledge in programs aimed at children’s health and development.

Strategies and resources for sustained USI/IDD monitoring exist in virtually all South American countries, although their implementation largely depends on improving awareness of the importance of such actions. It is paramount to advocate and train program managers, academia, the general population, and communicators to demand informed decisions and continued efforts to monitor iodine nutrition. Such efforts include:

- Prioritizing enforcement of fortification laws and their integration in routine activities of nutrition programs.
- Considering double duty action solutions to tackle the reduction of salt intake, while sustaining the outcomes of double fortification of salt with iodine and fluoride.
- Implementing mechanisms for efficiency in monitoring of target populations, for instance rotative sentinel sites in high-risk areas.
- Encouraging universities, Ministers of Health and governments to use available national databases to estimate nutrient intake and other data gaps.

We wish to express our recognition to the representatives of governments, academic institutions, the salt industry and especially IGN National Coordinators for their commitment to maintaining optimal iodine nutrition integrated into the global context of nutrition, health and human development.

References: https://ign.org/latest/uncategorised/review-of-iodine-nutrition-in-south-america/
How a social media network of young people is promoting the use of iodized salt in the Democratic Republic of Congo

Authors: Augustin Kamanda, Chef de Division de Normalisation et Contrôle de Qualité (PRONANUT), Bruno Bidamba Senge, Directeur (PRONANUT), Annie Mitelezi Kanene, Nutrition Officer (UNICEF), Elisabeth Zanou, Nutrition Manager (UNICEF), Dedenyo Adossi, Nutrition consultant (UNICEF), Denis Garnier, Chief of Nutrition (UNICEF) and Amal Tucker Brown, Regional Coordinator for West and Central Africa (IGN).

Editor’s note:
UNICEF’s U-report initiative is a messaging tool for young people around the world to engage with and speak out on issues that matters to them. U-reporters respond to polls and report issues. The data and insights are shared back with communities and connected to policymakers who make decisions about young people. U-Report is active in 68 countries, benefiting over 11 million users all over the world. U-report is available through messaging, social media and SMS channels, and works on the most basic mobile phone. It is free, anonymous and easy to use.

Over the past three decades, the Democratic Republic of the Congo (DRC) has made considerable progress in the fight against Iodine Deficiency Disorders (IDD), as illustrated in Figure 1. Collaborative efforts to implement a salt iodization programme in the DRC have achieved a national coverage of household iodized salt of over 90%, ensuring adequate iodine nutritional status among the population. While this improvement has been sustained for over 25 years, government attention to the program has diminished, especially in terms of monitoring and awareness-raising, among importers, distributors, and consumers. Unregulated local production of non-iodized salt has further exacerbated the situation.

New impetus to rejuvenate the program has emerged following a joint situational analysis conducted by the National Nutrition Programme (PRONANUT), UNICEF, and IGN, leading to the adoption of a new action plan, concentrating on institutional and community mobilisation, as well as strengthening the surveillance system and making strategic use of decision-making data.
Equipped with this new insight, the PRONANUT plans to raise the availability of iodized salt in households to over 90% by 2027, and to guarantee optimal iodine status of vulnerable populations by leveraging insights from past experiences. The new action plan encompasses all relevant sectors, including those involved in salt control, supply, and distribution, including consumers and the food processing industry.

Now, the DRC is harnessing the enthusiasm and civic commitment of young people, known as U-reporters, who actively contribute to positive change within their communities. Voluntarily engaged in community impact, these young U-reporters have previously supported nutrition programmes such as the promotion of vitamin A supplementation during national campaigns.

Building upon this experience, PRONANUT, in collaboration with UNICEF, has identified and selected 275 dynamic and leadership-oriented young people throughout the country, 48 from Kinshasa, and 227 from the other 25 provinces in the country, to:

- Raise awareness of the importance of combating IDD.
- Gather information from salt retailers and wholesalers to gain better understanding of the salt distribution system.
- Become agents of IDD and USI awareness in their communities.

This approach ensures that the message is shared by young people with their communities and networks, fostering acceptance of advice and encouraging ownership of the issue.

The initiative began with a pilot phase in Kinshasa in September 2023, where 48 young people (18 girls and 30 boys) underwent training before being deployed across Kinshasa over the subsequent two days. A scaling phase from October to November 2023 reached 4,571 individuals, including 60 importers, 787 wholesalers, 3,688 retailers, and 36 control officers (OCC/DGDA) throughout the DRC in just 10 days. Additionally, 2,579 individuals were made aware of the issue during the national day against IDD on 27th October 2023.

These young U-Reporters will return to their communities and continue to pass on information about the importance of using iodized salt to as many households as possible. They will also help test the salt at points of sale, and share this information with PRONANUT to better understand the iodized salt distribution circuit. This in turn cultivates a future generation of leaders committed to the fight against iodine deficiency disorders.
A cross-sectional survey of iodized salt usage in dining establishments in 12 provincial level administrative divisions in China, 2021-2022

Ying Zhang1,2, Jichun Wang2,3, Xiwei Li1, Wei Ma4, Jianqiang Wang1, Haiyan Wang1, Jing Xu1,4; Submitted: July 11, 2023; Accepted: August 24, 2023

Summary

What is already known about this topic?

The National Iodine Deficiency Disease Surveillance system is exclusively focused on monitoring cooking salt used within households. Currently, there is a lack of nationally representative data on the use of iodized salt in dining establishments.

What is added by this report?

This study evaluated 7,889 salt samples obtained from dining establishments located in 13 provincial-level administrative divisions across China. The findings indicated that coverage rate of iodized salt (CRIS) and the consumption rate of adequately iodized salt (CRAIS) were found to be 95.2% and 90.2%, respectively. Further, 880 samples were classified as iodized salt and 804 as adequately iodized salt. In coastal areas, the CRIS and CRAIS showed a significant decrease to 77.1% and 70.5%, respectively, when compared to the inland regions (P<0.01).

What are the implications for public health practices?

The data compiled could potentially fill the void in the national data concerning the use of iodized salt in dining establishments throughout China. It is of the utmost importance to increase the awareness of restaurant operators, particularly those located in coastal areas, about the benefits of iodine supplementation. Moreover, they should be encouraged to use adequately iodized salt.

Editor’s note

This is a reprint of an article published by the Chinese Center for Disease Control and Prevention in their publication China CDC Weekly/Vol.5/No.24

Universal salt iodization has been established as a safe and effective method for the control of iodine deficiency disorders (IDDs).1,2 Despite the annual National Iodine Deficiency Disease Surveillance, which began in 1995, only household cooking salt is analyzed. Yet, as the culture of eating out and ordering takeaway becomes more common, the contribution of household cooking salt to overall salt consumption has declined.3 Furthermore, current “Regulations on Salt Iodization to Mitigate the Risks of Iodine Deficiency” specify only that iodized salt is to be used in food products made and sold in deficient areas, leaving a gap in guidelines related to restaurant use. Hence, it is vital to scrutinize and assess the use of iodized salt

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(IS) and adequately IS (AIS) in dining establishments. At this stage, there remains a lack of nationwide, representative data on IS use in such settings. In response to this, the study in question employed a multiple-sampling technique to amass 7,889 salt samples from restaurants across 13 provincial-level administrative divisions (PLADs) in China, aiming to provide a nationally representative snapshot. Findings indicate that the coverage rate of IS (CRIS) and consumption rate of AIS (CRAIS) are 95.2% and 90.2%, respectively. However, when focused on coastal regions, the CRIS and CRAIS dropped to 77.1% and 70.5%, respectively, marking a significant difference from inland regions (P<0.01). This discrepancy suggests a need to enhance IDD awareness training for restaurant personnel in coastal areas to promote the procurement of IS.

This cross-sectional study was carried out from 2021 to 2022 across 13 PLADs of China, which were strategically divided into three regions: East, Central, and West. We executed a random selection of 4–5 PLADs from each region. Further, we subdivided each PLAD into five geographical divisions: east, west, south, north, and central. From each geographical division, two counties were randomly selected to serve as our sampling units. Each chosen county was then further dissected into five sampling areas, also based on geographical orientation. Subsequently, a town or sub-district with low water iodine levels was randomly picked from each particular sampling area. Within each chosen town or sub-district, we randomly selected two institutional canteens (either corporate or public) along with five medium-sized restaurants (MSRs) and five small restaurants (SRs). Ultimately, a total of 60 dining locations per county were selected, culminating in a comprehensive evaluation of 130 counties across China.

A 50-gram salt sample was meticulously extracted from the top, middle, and bottom sections of a salt package acquired from a selected dining establishment. The extraction process entailed using a moisture-free, airtight plastic bag. The salt iodine content (SIC) was then evaluated following the standards stipulated by the “General Test Method for Salt Industry Determination of Iodine” (GB/T 13025.7-2012). Salt that was iodized with KIO3 was scrutinized utilizing direct titration, while salt iodized with KI or other compounds was analyzed via redox titration. Salt with an SIC less than 5 mg/kg was termed non-IS (NIS). AIS was characterized as SIC within an allowed fluctuation range, defined as a deviation of ±30% from the average iodine content level in edible salt. The term “CRIS” was used to denote the ratio of salt samples boasting an iodine content equal to or greater than 5 mg/kg to the total samples tested, while “CRAIS” denoted the ratio of AIS samples to the total number tested.
The data for this study were inputted into Microsoft Excel 2016 (Microsoft Corporation, Redmond, Washington, USA) and subsequently transferred to SAS 9.4 for Windows (SAS Institute, Cary, NC, USA) to facilitate analysis. A test to verify a normal distribution was carried out on continuous data; data that were skewed were represented via median (quartile range). To compare groups with skewed data, nonparametric tests (including the Wilcoxon and Kruskal-Wallis tests) were utilized. Count and percentage, used to express qualitative data, were tested for proportional differences using the Chi-squared test. All of the statistical tests used were two-tailed, with P<0.05 being indicative of a statistically significant difference.

This study evaluated 131 counties across 13 PLADs in China, encompassing a population of 75,374,000 individuals with a per capita income of 35,508 Chinese Yuan (CNY). Among these counties, 19 (14.5%) are located along the coast in the PLADs of Liaoning, Fujian, Shandong, and Jiangsu. The details of the sample size are presented in Table 1. Among the 7,882 salt samples gathered, 95.2% were iodized, with notable variation across PLADs ($\chi^2=1592.59$, P<0.01). Of the 376 identified NIS, 58.5% were found in Shandong Province, 16.5% in Hebei Province, and 10.4% in Liaoning Province. A total of 7,107 AIS were discovered, with a consumption rate of 90.2% also showing significant provincial variation ($\chi^2=983.73$, P<0.01).

The median iodine content of IS was 25.3 mg/kg, presenting significant provincial variation as well ($\chi^2=1903.81$, P<0.01; Table 2). The coastal regions’ CRIS and CRAIS were observed to be less than 80%, significantly lower compared to those of inland regions (P<0.01; Table 3). There was a slightly lower CRIS found in MSRs in comparison to canteens and SRs, although the difference was not statistically significant (P=0.30). In canteens, SRs, and MSRs, the CRAIS exceeded 90% with no significant differences observed (P=0.93). The CRIS and CRAIS in fast food-serving establishments were marginally higher than those providing table meal service, even though the difference was not statistically meaningful (P>0.05).

Table 1: Characteristics of the surveyed areas and dining establishments.

<table>
<thead>
<tr>
<th>PLADs</th>
<th>Counties (N)</th>
<th>Residents (million)</th>
<th>Per capita income (thousand CNY/year)</th>
<th>Number of dine-out places</th>
<th>Types of dine-out places</th>
<th>Service type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Coastal</td>
<td>Inland</td>
<td></td>
<td>Canteen</td>
<td>MSR</td>
</tr>
<tr>
<td>Anhui</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>8.4</td>
<td>29.6</td>
<td>610</td>
</tr>
<tr>
<td>Fujian</td>
<td>10</td>
<td>3</td>
<td>7</td>
<td>5.1</td>
<td>36.6</td>
<td>600</td>
</tr>
<tr>
<td>Gansu</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>3.4</td>
<td>24.7</td>
<td>600</td>
</tr>
<tr>
<td>Hebei</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>5.0</td>
<td>30.8</td>
<td>600</td>
</tr>
<tr>
<td>Henan</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>9.0</td>
<td>26.4</td>
<td>601</td>
</tr>
<tr>
<td>Inner Mongolia</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>3.2</td>
<td>40.1</td>
<td>600</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>10</td>
<td>4</td>
<td>6</td>
<td>9.9</td>
<td>56.8</td>
<td>600</td>
</tr>
<tr>
<td>Liaoning</td>
<td>10</td>
<td>2</td>
<td>8</td>
<td>4.5</td>
<td>37.8</td>
<td>601</td>
</tr>
<tr>
<td>Shandong</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>6.7</td>
<td>56.2</td>
<td>601</td>
</tr>
<tr>
<td>Shanxi</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>5.3</td>
<td>28.6</td>
<td>660</td>
</tr>
<tr>
<td>Sichuan</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>4.6</td>
<td>29.6</td>
<td>600</td>
</tr>
<tr>
<td>Xinjiang</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>3.7</td>
<td>27.9</td>
<td>603</td>
</tr>
<tr>
<td>Yunnan</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>6.5</td>
<td>37.1</td>
<td>606</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>131</strong></td>
<td><strong>19</strong></td>
<td><strong>112</strong></td>
<td><strong>75.4</strong></td>
<td><strong>35.5</strong></td>
<td><strong>7,882</strong></td>
</tr>
</tbody>
</table>

Abbreviation: PLADs=provincial-level administrative divisions; MSR=medium-sized restaurant; SR=small restaurant; CNY=Chinese Yuan.
Discussion

The findings of this study indicated that the CRIS and CRAIS in dining-out venues were 95.2% and 90.2%, respectively. It was observed that these measurements were notably lower in coastal regions as compared to inland areas. However, no significant variance in CRIS and CRAIS was discovered among canteens, MSRs, and SRs. Furthermore, there was no statistically significant distinction in CRIS and CRAIS between establishments offering table meals and those providing fast food.

Table 2: Coverage rates for IS and AIS and iodine content at dining establishments by PLAD.

<table>
<thead>
<tr>
<th>PLADs</th>
<th>IS N</th>
<th>CR (%)</th>
<th>Median (P25, P75) (mg/kg)</th>
<th>AIS N</th>
<th>CR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anhui</td>
<td>604</td>
<td>99.0</td>
<td>21.7 (20.1, 23.3)</td>
<td>572</td>
<td>93.8</td>
</tr>
<tr>
<td>Fujian</td>
<td>589</td>
<td>98.2</td>
<td>24.2 (23.0, 25.4)</td>
<td>575</td>
<td>95.8</td>
</tr>
<tr>
<td>Gansu</td>
<td>600</td>
<td>100.0</td>
<td>26.6 (24.1, 29.6)</td>
<td>562</td>
<td>93.7</td>
</tr>
<tr>
<td>Hebei</td>
<td>538</td>
<td>89.7</td>
<td>24.3 (21.9, 26.4)</td>
<td>511</td>
<td>85.2</td>
</tr>
<tr>
<td>Henan</td>
<td>592</td>
<td>98.5</td>
<td>25.0 (22.8, 27.7)</td>
<td>555</td>
<td>92.4</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>595</td>
<td>99.2</td>
<td>24.5 (21.8, 26.9)</td>
<td>566</td>
<td>94.3</td>
</tr>
<tr>
<td>Liaoning</td>
<td>561</td>
<td>93.5</td>
<td>24.5 (21.9, 26.9)</td>
<td>523</td>
<td>87.2</td>
</tr>
<tr>
<td>Henan</td>
<td>587</td>
<td>97.7</td>
<td>25.2 (23.3, 27.2)</td>
<td>561</td>
<td>93.3</td>
</tr>
<tr>
<td>Shandong</td>
<td>381</td>
<td>63.4</td>
<td>23.4 (20.6, 26.0)</td>
<td>334</td>
<td>55.6</td>
</tr>
<tr>
<td>Shanxi</td>
<td>656</td>
<td>99.4</td>
<td>27.7 (25.4, 29.8)</td>
<td>599</td>
<td>90.8</td>
</tr>
<tr>
<td>Sichuan</td>
<td>597</td>
<td>99.5</td>
<td>26.9 (24.9, 28.8)</td>
<td>583</td>
<td>97.2</td>
</tr>
<tr>
<td>Xinjiang</td>
<td>602</td>
<td>99.8</td>
<td>28.1 (25.2, 31.1)</td>
<td>575</td>
<td>95.4</td>
</tr>
<tr>
<td>Yunnan</td>
<td>604</td>
<td>99.7</td>
<td>25.8 (24.1, 27.6)</td>
<td>591</td>
<td>97.5</td>
</tr>
<tr>
<td>Total</td>
<td>7,506</td>
<td>95.2</td>
<td>25.3 (22.8, 27.7)</td>
<td>7,107</td>
<td>90.2</td>
</tr>
</tbody>
</table>

Abbreviation: PLADs=provincial-level administrative divisions; IS=iodized salt; AIS=adequately iodized salt; CR=coverage rate.

Table 3: Coverage rates of IS and AIS based on location, types of dining establishments, and types of services.

<table>
<thead>
<tr>
<th>Variable</th>
<th>IS N</th>
<th>CR (%)</th>
<th>CH²</th>
<th>P</th>
<th>AIS N</th>
<th>CR (%)</th>
<th>CH²</th>
<th>P</th>
<th>Total salt sample N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal or inland areas</td>
<td>962.6</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td>584.2</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td>1,546</td>
<td>14.5</td>
</tr>
<tr>
<td>Coastal</td>
<td>880</td>
<td>77.1</td>
<td>804</td>
<td>70.5</td>
<td>1,141</td>
<td>14.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inland</td>
<td>6,626</td>
<td>98.3</td>
<td>6,303</td>
<td>93.5</td>
<td>6,741</td>
<td>85.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Types of dine-out places</td>
<td>24</td>
<td>0.30</td>
<td>0.2</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canteen</td>
<td>1,268</td>
<td>95.2</td>
<td>1,202</td>
<td>90.2</td>
<td>1,332</td>
<td>16.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSR</td>
<td>2,999</td>
<td>94.8</td>
<td>2,847</td>
<td>90.0</td>
<td>3,163</td>
<td>40.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR</td>
<td>3,239</td>
<td>95.6</td>
<td>3,058</td>
<td>90.3</td>
<td>3,387</td>
<td>43.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service types</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table meal</td>
<td>5,995</td>
<td>95.0</td>
<td>5,684</td>
<td>90.1</td>
<td>6,309</td>
<td>80.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast food</td>
<td>1,511</td>
<td>96.1</td>
<td>1,423</td>
<td>90.5</td>
<td>1,573</td>
<td>20.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: MSR=medium-sized restaurant; SR=small restaurant; IS=iodized salt; AIS=adequately iodized salt; CR=coverage rate.
According to China’s “Criteria for Elimination of Iodine Deficiency Disorders (GB16006-2008)” introduced in 2008, a household CRIS of ≥95% and a CRAIS >90% are requisite for IDD elimination. Hence, the values for household CRIS, CRAIS, and SIC have been incorporated into the national IDD control project as critical indicators for monitoring and evaluating iodine nutrition. However, due to rapid economic progress and increased speed of contemporary life, eating out, buying takeout, and consuming packaged foods are becoming the norm in China. Interestingly, in certain economically advanced areas of the country, household cooking salt no longer significantly influences the population's iodine status.\(^5\)\(^6\) Two surveys conducted in Shanghai illuminated that household salt iodine intake failed to impact the iodine status of pregnant women\(^5\) and children.\(^6\) Further, a monitoring study in Tianjin from 2016 to 2020 unveiled no correlation between the CRIS, CRAIS, and SIC of household cooking salt and iodine status indices within the population (specifically urinary iodine concentration and thyroid volume) once confounding factors were adjusted for.\(^7\) The said study’s authors proposed that the IDD control project’s household salt-related indicators should be amended to accommodate other indicators, such as SIC in school canteens.\(^7\) This current study involves an assessment of 7,889 salt samples taken from restaurants nationwide and effectively addresses the deficiency of IS monitoring data on such establishments. Furthermore, this study lays the groundwork for subsequent adjustments of IS monitoring indicators by providing essential data.

Multiple studies\(^5\)\(^6\)\(^8\)\(^9\) investigating household salt usage have discovered that the CRIS and the CRAIS in coastal regions were noticeably lower than those in inland areas. A research project in Qingdao City found that household CRIS and CRAIS stood at 88.2% and 86.2%, respectively, failing to meet the elimination criteria for IDD.\(^8\) A similar study in Guangxi Zhuang Autonomous Region indicated significantly lower CRIS and CRAIS (75.59% and 63.25%) in coastal households than in their inland counterparts.\(^9\)

Given this data, it was important to examine if a substantial difference existed in IS usage between inland and coastal restaurant settings. This study found that the CRIS and CRAIS in coastal restaurants were merely 77.1% and 70.5%, respectively, a marked difference to the 98.3% and 93.5% in inland establishments.

Interviews suggested that missing or inaccurate information may be contributing to this discrepancy, with one such misconception being the unnecessary consumption of iodized salt due to the regular intake of seafood in coastal areas. It should be noted that while coastal residents generally consume more seafood, the iodine content in seafood is only marginally higher than that in land-based animal foods.\(^10\) Thus, the iodine intake tends to be lower in coastal regions.

The highest quantities of iodine in seafood are generally found in specific types of seaweed, but consumption of seaweed is quite minimal. Furthermore, the presence of private salt farms in some coastal regions encourages the use of non-iodized coarse sea salt, resulting in a reduced CRIS.

A study by Mao et al.\(^11\) found that the urinary iodine concentration in pregnant women living in Zhejiang Province’s coastal areas was 107.54 µg/L, significantly lower than that of pregnant women in inland areas (152.54 µg/L).
It was speculated that this iodine deficiency was linked to the low local CRIS. Similar research by Chen et al. pointed out that the median urinary iodine of pregnant women in rural coastal areas of Fujian (134.9 μg/L) fell short of the World Health Organization’s recommendation.\(^\text{12}\)

To decrease the risk of iodine deficiency among residents of coastal areas, notably pregnant women and lactating mothers, it is crucial to raise not only household CRIS rates but also restaurant operators’ awareness of iodine supplementation. Encouraging restaurant operators to purposely purchase and utilize AIS can be a significant step in this direction.

A prior study indicated a higher incidence of CRAIS in large or MSRs compared to SRs.\(^\text{13}\) This was initially attributed to the deficient regulatory mechanisms within SRs, insufficient food safety awareness and improper management. However, the current study reveals no significant variance in CRIS and CRAIS distribution across diverse dining establishments. This can be reasoned through several factors. First, the recent years have seen an increase in coverage of food safety awareness and educational programs, thus augmenting the health consciousness of individuals responsible for SRs or those involved in procurement. Second, the introduction of efficient regulatory mechanisms has significantly mitigated the circulation of substandard IS in the marketplace.

This study possesses certain limitations. Due to its cross-sectional design, evaluating the temporal relationship between various factors was unattainable, thereby complicating the inference of causation. Additionally, a number of elements influencing the concentration of IS, inclusive of storage methods, purchase dates, and individual health consciousness, were not incorporated in the survey.

To our understanding, this constitutes the first substantial study examining the utilization of IS in dining establishments, thus yielding national-level representative data. This research scrutinized the usage of IS in 7,882 dining venues across 13 PLADs in China, thereby filling an existing void regarding IS data in such establishments within the country. The employment of IS in China’s dining places was deemed satisfactory. Moreover, CRIS and CRAIS in Canteens, MSRs, and SRs matched the criteria set for IDD eradication. Notwithstanding, the CRIS and CRAIS in coastal regions were significantly inferior to those in inland areas. Consequently, augmenting IDD knowledge among restaurant personnel in coastal areas is vital, enhancing their consciousness about purchasing IS. Similarly, it is crucial to bolster local supervision and surveillance mechanisms to suppress the distribution of non-compliant IS in the market.

**Conflicts of interest:**
No conflicts of interest.

**Acknowledgements:**
Centers for Disease Control and Prevention in Anhui Province, Fujian Province, Gansu Province, Hebei Province, Henan Province, Jiangsu Province, Liaoning Province, Inner Mongolia Autonomous Region, Sichuan Province, Xinjiang Uygur Autonomous Region, the Institute for Endemic Disease Control in Shandong Province, Shanxi Province, and Yunnan Province.
References


IGN is a partner in the EUThyroid2 consortium, which was awarded a four-year EU €2.5 million grant from Horizon Europe to find best practice models for reaching young people, especially young women, to improve awareness of their iodine status. The project brings together epidemiologists, endocrinologists, nutritionists, health economists, and communications specialists from a broad range of educational institutions and countries, as well as partners with global reach, such as the Thyroid Federation International and the World Iodine Association.

The project’s goal is to develop best-practice models to inform children, adolescents, and young women about iodine deficiency, with the ultimate aim of improving their iodine status. Building on the findings of the first EUThyroid consortium, which identified limitations in awareness of iodine nutrition in Europe, EUThyroid2 is set to implement community-based trials and intervention studies in multiple countries, including Norway, Cyprus, the United Kingdom, Slovenia, Poland, Bangladesh, and Pakistan.

A kick-off meeting was held between 27–29 March in Krakow, Poland, where partners and experts from various countries gathered to brainstorm effective strategies and develop best practice models for the prevention of iodine deficiency in Europe. The initial months were dedicated to the development of intervention materials, a crucial phase that integrated the expertise of diverse professionals involved in the consortium. The interventions take place in two settings: ambulatory care and educational, and were developed to ensure effectiveness and appropriateness for audiences in different geographic areas.

The ambulatory care intervention

For young women aged 18-24, the EUThyroid2 project employs a tailored approach: Young women in the intervention group complete a short screener to assess their iodine intake. Afterwards, a healthcare professional engages in an educational conversation with the participant, covering essential topics such as iodine functions, deficiency consequences, recommended intake, and considerations during or before pregnancy. Finally, participants receive an informative factsheet, and a link or QR code directs them to informative video content.
The video adopts a cooking show format, engaging participants in an immersive experience while addressing essential questions about ensuring sufficient iodine intake. Separate videos are tailored for participants in the UK and the rest of Europe, and for young women in Bangladesh and Pakistan, providing practical guidance on preparing iodine-rich recipes while underscoring the importance of local dietary practices.

Materials for the ambulatory care interventions are currently being tested in the United Kingdom to gain a comprehensive understanding of the interventions’ impact on awareness and iodine status. Testing of the ambulatory care interventions will be rolled out in other countries in the coming year.

**The educational intervention**

A key aspect focus of the EUThyroid2 project is education, particularly in secondary and vocational schools. The intervention employs a three-step model known as ‘The ABC of iodine awareness,’ with a mandatory core module A and optional supplementary modules B and C.

Module A’s proposed 35-minute lecture delves into the bodily functions of iodine, health consequences of iodine deficiency, and main dietary iodine sources. Students will engage in activities promoting active learning either in class or as homework. Module B fosters active cooperative learning. Students participate in assignments designed to reinforce their understanding of iodine-related concepts. Module C encourages creativity, with students being tasked with designing a poster for a national campaign highlighting the importance of iodine. Materials for the educational setting are being pre-tested, with timelines yet to be established.

The dissemination of study results, which will be scheduled in the final two years of the study, promises to shed light on best practices and contribute to a global conversation on iodine nutrition and thyroid health.
In the news

Assessing the impact of processed foods on iodine nutrition

Traditionally, efforts to combat iodine deficiency have centered on iodization of salt for household use, but it is becoming increasingly clear that industrially processed foods play an increasingly significant role in dietary salt intake worldwide, with the potential to reach populations who lack access to iodized salt at household level.

With support from the Bill & Melinda Gates Foundation, IGN developed guidance designed to assist national program managers in assessing the potential impact of widely consumed salt-containing industrially processed foods and condiments on iodine intake. To evaluate the guidance and pinpoint areas for refinement, its implementation was piloted in North Macedonia, the Republic of Moldova, Sri Lanka, and Thailand. Technical support from IGN facilitated the implementation process, which was conducted by national teams.

The results of this work are published in this collection of papers on four of the pilot programs, which illustrate how evidence from implementation could be used to strengthen existing national salt iodization initiatives. Find the collection here.

IGN Basil Hetzel Award winner Jonah Goodman on the curse of the goitre in Switzerland

2023 Basil Hetzel Award recipient Jonah Goodman’s recent article ‘A National Evil’ on the introduction of iodized salt to the Swiss public is featured in the latest edition of the London Review of Books. Goodman specializes in long form journalism and his work has been published in many prestigious publications, including The Atlantic magazine. His research on the impact of iodized salt on the lives of the Swiss population led him on a mission to uncover the historical roots of this transformative public health intervention. Last year, IGN honored Goodman with the Basil Hetzel Award, which recognizes individuals who have demonstrated exemplary commitment and made significant contributions to furthering IDD elimination through impactful public reportage. Read the full article here.

A big thank you and Happy New Year to our supporters from all of us at IGN! We look forward to working with you all in 2024.
IGN has a unique and committed network of Regional and National Coordinators, who have been crucial to success in improving iodine nutrition. Our National Coordinators, who are largely volunteers and often work for government agencies, development agencies, or nutrition institutions, are invaluable sources of country-specific knowledge, offering in-depth insights and serving as vital contacts and partners in the implementation of essential activities.

They identify issues and advocate for support to address them, providing technical assistance in designing, implementing, analyzing, and reporting on iodine-related interventions. Additionally, they play a pivotal role in supporting the implementation of legislation and regulations pertaining to salt iodization.

In this column, we will highlight the work of individual National Coordinators, asking specific questions to give a broader understanding of their importance to our organization.

Lilia Turcan, IGN’s National Coordinator in Moldova

Lilia has played a pivotal role in advancing the comprehensive initiative focused on linking salt iodization with reducing salt consumption. Lilia has more than 16 years experience in policy development and program management for maternal and child health, working in CEE/CIS region, Lao PDR, Indonesia, Uganda and the USA. In Moldova, through successful advocacy and technical support, she contributed to the adoption of a government resolution mandating iodized salt in the baked goods industry, a crucial step in enhancing iodine nutrition and preventing deficiency disorders among the Moldovan population. We caught up with her to ask her some questions about her work.

**As a National Coordinator, what motivates you to contribute your time and effort to this cause and the Iodine Global Network?**

Iodine is a micronutrient crucial for the development and well-being of newborns and young children. Despite the easy and affordable solution of iodized salt being available worldwide, not every child or pregnant woman in Moldova has access to it. Much effort is still required to make this a reality. Serving as a conduit for expertise and resources from IGN’s extensive network to public health professionals in Moldova has proven to be both beneficial and necessary. This realization has strengthened my commitment to continue our work and efforts.

**How do you collaborate with local stakeholders and partners to improve the program?**

Our collaboration is multifaceted, drawing on years of prior interactions and maintaining regular exchanges with the UNICEF Office in Moldova. We regularly share new evidence, and IGN’s periodic newsletters prove highly valuable in this regard. I also actively participate in the national working group on National Prevention of Non-Communicable Diseases. This involves the analysis and monitoring of trends in health and nutrition, as well as the updating of related regulations. We also supported Moldova’s initiatives in sharing local evidence on the use of iodized salt, particularly in the food industry. We have made special efforts to broaden the composition of the working group, incorporating non-health sectors and attracting food technology specialists from the national State University, education sector professionals, as well as social media professionals to advocate for the universal use of iodized salt.
Can you share the biggest challenges you face in your role?

Despite its critical importance for the well-being and prosperity of individuals and society, human nutrition programs and efforts suffer from a very low profile in national, regional, and local agendas. The most problematic issue is the low priority given to nutrition, particularly micronutrients throughout the life cycle, in medical and public health teaching curricula, with a lack of well-defined teaching or evaluation modules. Another significant challenge is the almost complete absence of effective monitoring of outputs and results for nutrition as part of national monitoring systems, including within e-health systems and databases.

What are some successes or achievements you had in your role? What are you most proud of?

Over the last couple of years, we directed our efforts towards capacity-building for the regulatory monitoring of iodized salt. Recently, a joint decree from public health and food security agencies is in progress, outlining new provisions for monitoring salt at retail units, the bread industry, and public catering. Upon implementation, it will enable a process-based monitoring and reporting system.

How do you see the future of iodine nutrition in your region and what do you need to make it better?

Although the iodine status of populations in the Eastern European and Central Asian region has improved dramatically over the last two decades, thanks in large part to IGN (and before that ICCIDD), UNICEF, and partners’ efforts, the problem of iodine deficiency is far from being resolved, and pockets of iodine deficiency are widespread, including in Moldova—potentially in the northern region, in the breakaway Transnistria, as well as some rural areas. Indicators on iodine nutrition should be included in national health monitoring, routine as well as national, such as STEPs, DHS, MICS, or any other national surveys. Food control agencies have to build capacity on micronutrients, which is currently virtually nonexistent, and establish effective control, including the regulatory monitoring of the iodized salt supply chain.

Continuous support from IGN is critical in ensuring continuous advocacy at all levels, sharing of evidence and country experience, and analysis of progress, bottlenecks, and opportunities.
Faiz Rasool, IGN’s National Coordinator in Pakistan

Faiz has been dedicated to improved iodine nutrition, with notable results that include leading efforts to examine the contribution of iodized salt in processed foods in Pakistan, advocating for the supply of KIO3 in Afghanistan, and facilitating the use of rapid test kits there to ensure salt iodization, ultimately contributing to the prevention of iodine deficiency in Afghanistan’s 40 million population. IGN’s intervention and advocacy played a pivotal role in this impactful initiative. In his day-to-day job as Policy Adviser in the Global Alliance for Improved Nutrition, he promotes the iodine agenda in Pakistan through numerous efforts over the many years he has worked on this. Most recently he trained survey staff on the iodine module as part of the MICS survey in Punjab Province.

As a National Coordinator, what motivates you to contribute your time and effort to this cause and the Iodine Global Network?

Recognizing the critical role iodine plays in preventing iodine deficiency disorders, including intellectual disabilities in children, I am driven by a commitment to fostering national health and development. IGN’s mission aligns with my passion for public health and my desire to make a meaningful difference in the lives of individuals and communities.

I am deeply motivated to contribute my time and effort to the Iodine Global Network as the national coordinator for Pakistan due to the profound impact that sustainable iodine nutrition can have on the health and well-being of our population. By working towards ensuring universal access to iodized salt and advocating for comprehensive iodine programs, I believe we can create lasting positive change in Pakistan. The collaborative efforts of the Iodine Global Network inspire me, and I am dedicated to advancing iodine nutrition strategies to secure a healthier and brighter future for our nation.

Can you share the biggest challenges you face in your role?

While my role as National Coordinator is very exciting, it comes with a few associated challenges. One of the most significant hurdles I encounter is ensuring the capacity and resources for the sustained availability of KIO3 as a fortificant for the large spread of small and medium-scale salt processors across the country. Shifting from qualitative methods to adopting quantitative methods in household-level surveys requires considerable effort and time. Additionally, coordinating with various stakeholders, including governmental bodies, NGOs, and international organizations, to align strategies and secure necessary resources demands ongoing effort. Another critical challenge lies in addressing regional disparities and tailoring interventions to suit the unique socio-economic and cultural contexts of different provinces. Balancing the need for standardized national approaches with the flexibility required for localized impact is a delicate task.

Despite these challenges, I am driven by the belief that overcoming them is essential for realizing our collective vision of eradicating iodine deficiency disorders and ensuring the well-being of all Pakistanis.

How do you collaborate with local stakeholders and partners to improve the program?

I believe that collaboration with local stakeholders is integral to the success of our iodine nutrition program and is crucial for positioning IGN as a technical partner to support country programs in a catalytic manner. I actively engage with esteemed organizations such as UNICEF, the National Fortification Alliance, WFP, provincial partners including the Bureau of Statistics, and educational institutions to enhance the effectiveness and reach of salt iodization initiatives. By fostering a collaborative approach, we harness the collective expertise, resources, and networks of these partners to strengthen advocacy, implementation, and monitoring efforts. I engage in regular coordination meetings, joint workshops, and data-sharing mechanisms to ensure a unified and well-coordinated approach across all levels.

Together, we work towards aligning strategies, sharing best practices, and leveraging each other’s strengths to achieve our common goal of sustainable iodine nutrition. This collaborative framework not only enhances the impact of our programs but also creates synergy that fosters innovation and adaptability to address the unique challenges around iodine nutrition faced by different regions within Pakistan.
What are some successes or achievements you had in your role? What are you most proud of?

One significant achievement is the successful advocacy with development partners and government institutions, highlighting IGN’s vision, mission, and potential support for technical matters. I successfully enhanced support for salt iodization by providing technical assistance and facilitating training for the “Bureau of Statistics- Punjab- BOS” during the MICS household survey. This included collaboration with provincial stakeholders to produce an animated video on household salt testing with Rapid Test Kits (RTKs). I am particularly proud of addressing a shortage of RTKs in Afghanistan, ensuring the export of 30,000 high-quality RTKs to overcome monitoring challenges and iodization quality issues. This involved engagement with the health authorities in Afghanistan, the RTK manufacturer in Pakistan (Nuclear Institute for Food and Agriculture- NIFA), and other relevant government entities, overcoming political, logistical and security challenges.

Also, I conducted a processed food study in collaboration with local consultants to identify existing gaps in the use of iodized salt in processed food items; mobilized academia representatives and private sector stakeholders to actively participate in IGN regional webinars on iodine nutrition; and convened a conference with provincial stakeholders in Punjab on “Salt Iodization,” featuring international speakers to establish a connection between global best practices and local challenges.

How do you see the future of iodine nutrition in your region and what do you need to make it better?

I envision a promising future for iodine nutrition in our region marked by sustained progress and improved health outcomes. To enhance this vision, there is a critical need for continued collaboration among local and international stakeholders, governments, and communities to ensure the widespread implementation of iodization programs. Strengthening advocacy efforts focused on market surveillance and monitoring and expanding educational campaigns to raise awareness about the importance of iodine nutrition at the market/consumer level will be vital in fostering lasting behavioral change. Additionally, investing in research and monitoring mechanisms will allow us to adapt strategies to evolving challenges and maintain the quality of iodized salt.
Omar Obeid, National Coordinator for Lebanon

Omar, Professor at the American University of Beirut in his day job, is motivated by a strong belief in the impact of iodine on people’s health, especially children, recognizing the program’s simplicity and cost-effectiveness. His work includes examining the impact of processed foods on iodine intake and advocating with salt producers to enhance their engagement, showcasing his commitment to advancing iodine nutrition initiatives in the region.

As a National Coordinator what motivates you to contribute your time and effort to this cause and the Iodine Global Network?

My strong belief is that iodine has a significant impact on the health of people, especially children, while also recognizing that salt iodization programs are easy to implement and cost-effective.

How do you collaborate with local stakeholders and partners to improve the program?

Being associated with a research and educational institution like AUB makes collaboration easier. As a university, we play a role as university in monitoring and surveys, and through our lab we assist in iodine status analysis for Lebanon but also for other countries such as Syria. The lab capacity has been enhanced with IGN support. I have established positive relationships with various ministries involved in salt iodization. Simultaneously, I have fostered connections with several UN agencies, especially UNICEF. Additionally, due to the limited number of salt factories in the country, building relations with them has been a straightforward process.

What are some successes or achievements you had in your role? What are you most of proud of?

I revitalized the issue of salt iodization in Lebanon by offering practical solutions to keep monitoring going and also to continue dialogue with the stakeholders. Additionally, I successfully amended the regulation of salt iodization through collaboration with the Ministry of Public Health, ensuring greater clarity for the industries involved.

How do you see the future of iodine nutrition in your region and what do you need to make it better?

Having recently conducted a survey and awaiting the results, we plan to formulate a clear strategy. In our region, there is a crucial need for sustained monitoring and follow-up. To address concerns, increased lobbying at the level of ministries and salt producers is essential. Conducting surveys every five years to assess the impact of iodization is a priority. Leveraging success stories could prove effective in influencing policymakers.

Can you share the biggest challenges you face in your role?

In recent years, the deteriorating economic situation, coupled with the devaluation of the currency, has impacted the country’s monitoring process. The enforcement agencies could not operate because the cost of fuel for factory visits, along with the expenses related to iodine determination, presents a significant challenge. As a result, no one knew if iodized salt supply faced any challenges or not.
The IDD Newsletter is published quarterly by the Iodine Global Network and distributed free of charge 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: info@ign.org.

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