In 2013–2014, Iodine Global Network in collaboration with UNICEF’s Regional Office in Panama conducted three sub-regional workshops in Latin America, as part of the Sustainable Elimination of Iodine Deficiency Disorders in Latin America (STELA) project. Their aim was to strengthen existing iodization programs by identifying the key factors that enable sustainability. The focus was on integrated approaches based on nationally-owned programs designed to overcome the challenges to USI in each of the sub-regions.

**Background**

Over the past several decades, the Latin American Region (LAR) has made great strides toward the elimination of iodine deficiency disorders (IDD), and at present it has the broadest population coverage with iodized salt among all WHO Regions. Several LAR countries are successfully sustaining IDD elimination, others have yet to achieve adequate iodine status, and in some countries the sustainability of existing programs may be at risk. Universal household access to adequately iodized salt (≥15 ppm of iodine) has not yet been achieved across the region, and more effort is needed to improve the capacity and technology of the small- and medium-size iodized salt producers. But the population coverage with adequately iodized salt has remained high since 2003, at about 85% (Table 1).

Based on the prevalence of urinary iodine concentrations (UIC) <100 µg/L in school-age children (SAC), the Americas have the lowest prevalence of low iodine intakes (13.7%) out of all WHO Regions. Only Guatemala, Guyana, Dominican Republic, and Haiti remain iodine deficient at a national level. Five countries show evidence of iodine excess (Brazil, Columbia, Nicaragua, Paraguay, and Uruguay). Nearly 99% of the total SAC population in the WHO Americas Region is covered by iodine surveys, although nearly a third of the survey data are sub-national. Not all countries perform routine monitoring. Hence, the data on iodized salt coverage and UIC may be out of date in some countries.

There is also growing interest in implementing the WHO recommendation to reduce salt consumption, which must be managed in conjunction with efforts to achieve USI and sustain the elimination of IDD.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (millions)</th>
<th>Population covered (millions)</th>
<th>% covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995–2004</td>
<td>531.6</td>
<td>450.2</td>
<td>84.7</td>
</tr>
<tr>
<td>2005–2013</td>
<td>559.9</td>
<td>507.5</td>
<td>90.6</td>
</tr>
</tbody>
</table>

In eleven countries, more than 90% of households are consuming adequately iodized salt, and in four the coverage is 80–89%. There are only three countries (El Salvador, Guatemala, and Venezuela) with coverage between 54–79%. It is assumed that these levels are remaining constant, although only seven countries carry out regular monitoring (Cuba, Ecuador, El Salvador, Panama, Paraguay, Peru, and Venezuela). Overall, the household coverage with adequately iodized salt across the LAR has increased from 84.7% in 1995–2004 to 90.6% in 2005–2013.
**Status of iodine nutrition**
Based on UIC in SAC, regional iodine nutrition has continued to improve since the 2004 Regional Meeting in Lima (“Optimal Iodine Nutrition in the Americas”) (Figure 1). While in 2004 there were five iodine-deficient countries (Bolivia, Guatemala, Guyana, Dominican Republic, and Haiti), currently only Haiti remains iodine deficient; Bolivia, Guatemala and the Dominican Republic have achieved sufficiency. The situation of Guyana is uncertain because the last survey was conducted in 1997. The median UIC in SAC is above 100 µg/L in almost all LAR countries. In seven, the MUIC is above 300 µg/L (Brazil, Chile, Colombia, Costa Rica, Honduras, Paraguay, and Uruguay); however, the figures from Colombia, Chile, Honduras, and Uruguay may be out of date. Five countries (Ecuador, Panama, Paraguay, Peru, and Venezuela) conduct regular national surveys every 2–3 years, and the remaining countries rely on sub-national or regional surveys. Several studies have reported that pregnant women may be at risk of iodine deficiency despite normal UIC levels in SAC.

**Outcomes and lessons learned**

**Political support and sustainability of IDD elimination**
The pre-requisites for sustainability include government commitment and ownership, enforcement of USI legislation, salt industry support, and monitoring. The meetings found that some countries have registered a decline in political commitment and undue complacency as a result of partial success. The meetings stressed the need to strengthen the commitment from the government, the salt industry, and from other stakeholders, and to continue promoting the understanding of consequences of IDD and the vital role that USI plays in national economic and social development.

**Lessons learned:**
The five Andean countries were declared virtually free of iodine deficiency more than 15 years ago (Bolivia in 1996, Peru in 1996, Ecuador in 1999, Colombia in 1998, and Venezuela in 1999). Yet, their individual IDD control programs have followed different paths. Peru, Venezuela, and Ecuador reported recent UIC data demonstrating sustained elimination of IDD. Conversely, Bolivia is still struggling to secure iodized salt production, and since 2004 Colombia has discontinued all official activities including the surveillance of USI and UIC. In both countries, the efforts to meet the key pre-requisites for sustained IDD elimination have either waned or disappeared.

**Salt iodization and quality assurance**
The meetings led to renewed attention and commitment to securing universal and sustained household access to good quality iodized salt across the LAR. Issues that remain to be addressed include (a) heterogeneous legislation leading to an unjustifiably wide range of mandated iodization levels; (b) concurrent use of KIO₃ and KI in one country, which increases the costs of monitoring iodine levels in the salt and quality control; (c) persistence of rudimentary technology used by small- and medium-size producers; (d) decline of interest within the government and the salt industry in regular monitoring of salt iodization levels; and (e) ongoing shortages of KIO₃ as a result of bureaucracy.

**Lessons learned:**
1. The Dominican Republic case study illustrates the issues associated with using both KIO₃ and KI to iodize salt. In 2009, 1791 salt samples were tested for KIO₃ but not for KI, yielding a very low result (only 37% of samples contained ≥15 ppm of iodine). At a later date, 19 samples collected at a retail level were tested for both compounds, and the result showed that 95% of the samples contained ≥15 ppm iodine (48.6% as KIO₃ and 46.4% as KI).

ii. The difference in the quality of iodized salt produced by large- and small-scale producers using, respectively, high- and low-end technology, is demonstrated by the results of quality control in Mexico: 95% of the salt from large plants, and only 54% of the salt produced by small plants, was adequately iodized.

**Role of the salt industry**
In the implementation of USI for sustained elimination of IDD, the salt industry is by far the most important ally. Unfortunately, its important role is not fully understood or exploited equally in all the countries. Importantly, the small and medium producers may be less able to fulfill their role without receiving support themselves.

**Lessons learned:**
Mexico and Brazil are good examples to follow. The main producers of iodized salt in those countries formed associations that provide strong and effective support to their national IDD control programs. Mexico’s AMISAC (Asociación Mexicana de la Industria Salera), in association with governmental institutions, is responsible for regular quality control surveys at the retail level and for organizing training seminars for small producers.
**Surveillance and monitoring**

In some countries, the enthusiasm for implementing USI has not been matched by a similar level of interest in monitoring its impact on iodine nutrition. The immediate consequences of this situation include iodine deficiency persisting in some areas, a surge of iodine excess in others, and a risk of iodine deficiency during pregnancy.

**Lessons learned:**

Regular monitoring and surveillance of iodized salt and UIC is carried out in four countries: Peru, Panama, Venezuela, and Ecuador. As a result, all four countries have sustained optimal iodine nutrition for more than fifteen years.

**Iodine nutrition and pregnancy**

Recent data demonstrating the risk of iodine deficiency during pregnancy in various countries have raised concerns. The need to further investigate the regional prevalences and methods of preventing this risk was prioritized over the need to reduce salt intake during pregnancy and to promote salt reduction policies in the general population. In this context, there is a clear need to better understand the effect of iodine excess on fetal and newborn development.

**Education and communication activities**

It is likely that the general population and some public agencies have low awareness of the consequences of ID and the benefits of its prevention through USI. Goiter is still perceived as synonymous with iodine deficiency, whereas brain damage and cognitive impairment are much less likely to be associated with ID. The disruption or decline of maternal and child health programs has limited the participation of the general population in efforts to achieve IDD elimination. Optimal iodine nutrition is a child’s fundamental right. USI messages should be incorporated into formal and informal education programs, and vigilant advocacy is needed to maintain the awareness among the public, within the government, and among other key sectors that lend their support to IDD programs.

**Lessons learned:**

In the past, Uruguay implemented a strong educational campaign on the elimination and prevention of goiter (then a recognized indicator of ID) by means of salt iodization. Key messages were incorporated into textbooks for elementary schools. The campaign was very successful. However, once IDD was under control, the messages were withdrawn, and goiter recurred.

**USI in the context of salt intake reduction policies**

The meeting participants discussed at length the challenge of promoting salt iodization as the most cost-effective strategy to optimize iodine status, while there is a parallel push to reduce sodium consumption to prevent chronic cardiovascular disease.

Experts at the meeting allayed concerns that programs to reduce dietary salt intake could adversely impact USI programs. Iodine levels in salt can be adjusted up if needed to match reductions in salt intake. It was stressed that an integrated approach is necessary to implement the reduction of salt intake while retaining USI as the main strategy for IDD elimination.

Some countries (Argentina, Brazil, and Colombia) are already promoting the reduction of salt consumption, although they have yet to achieve IDD elimination, and the methodology for simultaneous surveillance of iodine and sodium nutrition in the population is not yet well-established. Two case reports, from Mexico (Instituto de Nutrición Salvador Zurbiran) and Guatemala (INCAP), demonstrated the feasibility of a double assay (measuring both I and Na) in a 24-hr urine sample. But this method is difficult to use in the field; collection of spot urine samples is simpler and is currently recommended to monitor population iodine status.
Future goals
An important objective of the workshops was to develop national work plans. The most commonly adopted goals included:

- Revive and strengthen political commitment to USI and the sustained elimination of IDD, including a national budget allocation for the program.
- Improve the technical capacity of iodized salt programs, particularly with respect to monitoring, with a focus on the most vulnerable population groups.
- Provide technical assistance where needed to the salt industry to improve the quality assurance of iodized salt produced by small- and medium-scale processors.
- Regularly assess iodine nutrition status not only in school-age children but also in pregnant women.
- Reinforce/implement maternal and child health programs; publish and disseminate the findings of new surveys of household consumption of iodized salt and UIC.
- Generate and sustain the interest and participation of the entire population in activities geared toward IDD elimination.
- Implement/activate effective national coalitions, incorporating into the teams a representative of consumer protection agencies.
- Move toward standardization of legislation that sets the salt iodization levels across all countries of the LAR.
- Effectively integrate USI and the strategy to reduce salt consumption in order to prevent the risk of recurrence of iodine deficiency.