

Making salt iodization truly universal by 2020

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b. Consolidation and modernization of the salt industry

The salt industry has been entrusted with the responsibility of dovetailing iodization into the prevailing salt production and distribution system, creating a standard of adequate iodization at minimum cost and disruption. In large streamlined processing plants iodization is a relatively simple step. Over the past two decades there have been significant investments in salt refining capacity in several countries coinciding with the expansion of salt iodization coverage. In India, salt refining capacity has increased from less than 5% to nearly 60% over the past 15 years. Over the same period, China has undergone a major modernization of salt refining, iodization and packaging facilities across nearly 2,000 facilities in the country, involving an investment of over US\$200 million (2).

Iodization in medium/small operations poses more significant challenges in countries where salt manufacturing techniques and product quality vary over a wide spectrum of operations from cottage scale units producing a few hundred tons a year to very large fully automated plants producing several million tons. Thus the strategies used to achieve the first 50–60% coverage of iodized salt in several countries may not necessarily result in addressing the challenge for the remaining 40% of the population.

Background

The past two decades have seen great progress in global awareness of the problem of iodine deficiency and its alleviation through the iodization of salt. Globally, 76% of households are consuming adequately iodized salt. Yet only one fifth of countries reporting in 2014 had reached the 90 per cent target of universal salt iodization. Most had reached only 50 to 70 per cent coverage. Globally nearly 30% of school-age children are estimated to have insufficient iodine intakes and there are indications that global progress is slowing. These figures underscore the continuing need for support to national salt iodization programs.

Salt iodization probably represents the first large-scale experience in national fortification of a commodity to eliminate a public health problem. It has taught valuable lessons in collaboration between government, industry, international organizations, the community at large and other sectors. It has

also offered insights into building and sustaining an intervention politically, technically, managerially, financially and culturally.

Overview of global progress

a. Growing awareness and resources for nutrition

The past five years have seen increasing realization of the importance of nutrition as central to human development. Independent reviews such as the Copenhagen Consensus (1) have consistently ranked micronutrients as the most cost effective development intervention. The evolution of the Scaling Up Nutrition (SUN) movement to bring together the various stakeholders under a single umbrella network has focused greater attention and resources for nutrition at the global, regional and national levels. Iodine nutrition should capitalize on this positive environment in order to sustain its priority for attention and intervention.

In some countries multiple levels of iodization and packaging have posed problems in quality assurance. Raw salt producers, who often do not have the capacity to consistently produce good quality iodized salt and to monitor its quality, supply their un-iodized salt to multiple small re-packagers who assume the task of iodization and packing the salt into consumer-sized bags. The result can be salt of inconsistent quality and iodine content. One strategy has been to encourage the raw salt producers to iodize at source while another strategy has seen large processors buy up the salt produced by cottage scale producers and either iodize it in their facilities or apply it to non-food grade use (3). The stability of iodine in salt and levels of iodization and packaging are also related to issues of quality assurance. By refining and packaging salt in a good moisture barrier, such as low density polyethylene bags, iodine losses have been significantly reduced, during storage periods of over six months.

c. Monitoring and evaluation

As a key component of any public health intervention, the monitoring of progress towards the goal and the evaluation of results—in this case the elimination of iodine deficiency—is critical. Improved monitoring and surveillance can also guide program adjustments as habits and diets change over time. While quality assurance of iodized salt occurs at the factory or production level, the testing of salt samples at the household level, done by Multiple Indicator Cluster Surveys (MICS) within the Demographic Health Surveys (DHS), is useful to assess whether that iodized salt is making its way into household use or if there may be a leakage of non-iodized salt into the household, the latter being especially important to countries with mandated salt iodization (4).

There has also been innovation in field test kits to allow for field testing of iodine levels in salt thereby enabling salt producers to monitor the quality of their product at source. Starting with dropper test kits, the technology has evolved to electronic test kits that determine iodine content with reasonable accuracy. The instruments also enable the test readings to be transmitted from the field via cell phones to central servers for monitoring and collation. Work continues to refine such tools.

d. International support

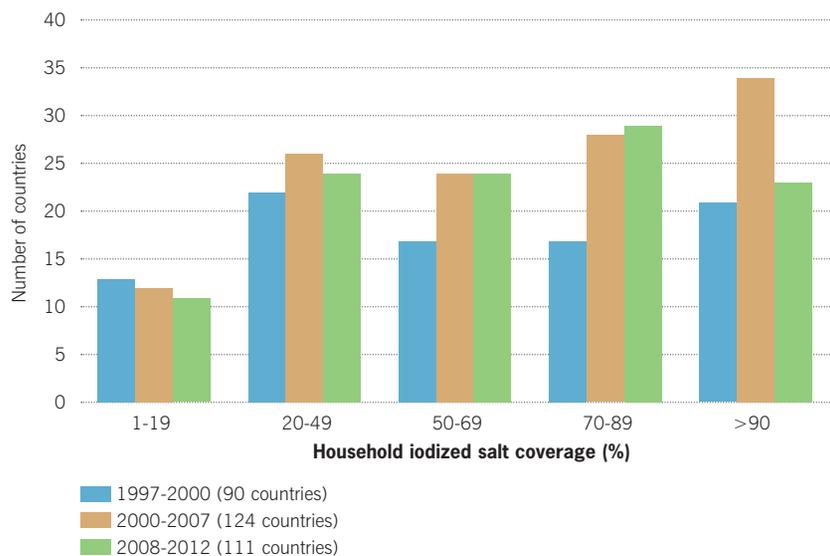
Over the past two decades several agencies have played pivotal roles at the global, regional and national levels to support the development and expansion of salt iodization programs in high burden countries—notably UNICEF (with support primarily from Kiwanis International), Micronutrient Initiative (with support from the Canadian Government) and GAIN (with support from the Bill and Melinda Gates Foundation). Global support over the last decade alone exceeds \$100 million and has been targeted to address key bottlenecks with support evolving from technical and financial assistance to building self-sustaining programs that will continue when external support is withdrawn.

to engage with other stakeholders in the global iodization and iodine deficiency elimination effort and understand the latest situation and trends in iodine nutrition and salt iodization coverage. They also need to present the salt industry viewpoint at such meetings. Once a national program is established and universal coverage of iodized salt is achieved the cost of the intervention is virtually transferred to the consumer.

b. Sustained public education and social mobilization

IDD elimination programs are threatened to be victims of their own success, yet iodine deficiency must be continuously addressed or it will re-emerge. Thus on-going communication efforts through multiple chan-

FIGURE 1 Progress in iodized salt coverage (1997–2012)



Source: UNICEF SOWC 2002: Database 1997-2000; SOWC 2009: Database 2000-2007; SOWC 2014: Database 2008-2012

Key determinants to achieve USI

a. Making salt iodization a global industry norm

The salt industry must accept and integrate iodization as part of its standard operating procedure for production of all varieties of salt for human and animal consumption. Salt Industry Associations at regional, national or sub-national levels should commit to compliance by all their members. Representatives of the salt industry also need to be active members of international networks such as the ICCIDD Global Network and Scaling Up Nutrition (SUN) meetings

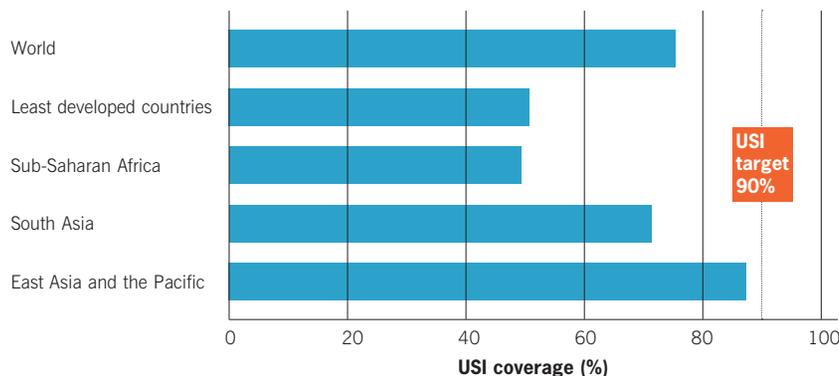
(including the media, health systems, and schools) are critical.

c. Supporting small salt producers

While large producers account for nearly 75% of all salt for edible consumption in salt producing countries, a small but significant proportion of the salt is produced by many small producers. These small salt producers are often the main salt source to the communities that are not reached by the conventional iodized salt suppliers and therefore most at risk of IDD.

Small producers need help—some would say protection—to compete and stay viable. Associations of small producers/

FIGURE 2 Percentage of households with adequately iodized salt (>15 ppm) 2007–2011



Source: UNICEF

processors are often able to improve market access and sustain sales of the product. They may also assist in improving cleaning and packing. While small-scale processors are responsible for the ‘last mile’ of coverage, they need sustained and secure markets.

Equally important is a sustainable and secure procurement chain for raw materials and consumables like potassium iodate (in convenient size packages and at fair prices), salt packaging material, equipment and supplies.

In recognition of the role of these small salt producers, pilot initiatives have been undertaken in several countries. In Senegal, which has more than 10,000 operating small producers, it was not the ban on non-iodized salt as much as the prospect of financial returns that motivated those involved in the pilot project to join into associations of producers with financial and technical support and training to enable them to produce a quality of iodized salt that complied with national standards while increasing their overall productivity (5).

In Rajasthan, India, where small salt producers account for 88% (1.3 million metric tons) of the state’s total production for human consumption, the pilot project aimed to build the iodization capacity of small salt producers through the provision of technical inputs, teaching good business and quality assurance practices, and by establishing a revolving fund operated through their newly formed cooperatives to provide the salt producers with the financial support to upgrade their facilities, leverage other loans and expand their capacity (6).

In both cases, the support has been intensive in the initial phases with equipment and technical assistance provided, but

built into the projects is a scheme to, first, promote the economies of scale (sharing of equipment and facilities) and, second, to support the sustainability of the operation and transfer the ownership of the production of iodized salt to the small producers.

d. Engaging the processed food industry

Universal salt iodization intends that all salt for human and animal consumption is iodized. In practice, however, USI efforts do not always include salt used in processed foods. Even when legislation permits the voluntary use of iodized salt in processed foods, this does not necessarily translate into practical application. USI program guidelines often do not specify measures (such as advocacy, monitoring) directed at the use of iodized salt in processed foods.

And food processors may be reluctant to use iodized salt stating concerns about its effects on their food products and trade barriers due to legislation variations (7).

However, consumption patterns are changing, particularly in industrialized countries, resulting in a shift in the source of iodine intake. For example, in the USA approximately 70% of the total salt intake comes from processed foods, while discretionary use of table salt contributes only about 15% of salt consumed, and the remaining 15% is found naturally in foods. As a result, national programs relying upon the fortification of table salt alone may not be adequate. There are examples of successful national strategies (e.g. Netherlands, Belarus) which specifically utilize iodized salt in processed foods as a means to achieve adequate iodine nutrition in the population.

Evidence suggests that, for common food commodities, the use of iodized salt in processing does not affect organoleptic properties. However, concerns about trade barriers pose a bigger problem as legislation varies greatly from country to country. In a world of interrelated geo-politics and trade, harmonization becomes increasingly important. Efforts such as those by EURRECA Network, which works in the context of the EU to address the problem of national variations in micronutrient recommendations, may offer a way to overcome this stumbling block (8).

e. Making iodine nutrition a priority in Europe

Europe has the distinction of being the region with the highest prevalence of iodine deficiency and the lowest coverage of salt iodization in the world. This means that 52%, almost 460 million people, in Europe have insufficient iodine intake (9). This has implications not only for Europe but also influences the perspective of policy makers in the rest of the world who see an important part of the developed world not taking iodine nutrition seriously. In countries where salt iodization has not been undertaken as a public health measure, the outcomes are telling. In Russia and the Ukraine, only 35% and 18% respectively of households consume properly iodized salt, making 985,000 infants in the Russian Federation and 344,000 infants in the Ukraine unprotected from brain damage caused by IDD (10).

The clues to the underlying source of these developments lie in the challenges facing Europe. First, salt iodization is not universal in Europe. Some countries have compulsory salt iodization, such as Denmark, whereas in others it is voluntary. Some countries mandate salt iodization but do not permit the use of iodized salt in processed foods e.g. Poland. Netherlands, on the other hand, has focused on iodized salt in bread as the primary vehicle for maintaining iodine intake in her population. Second, the approaches to iodization are many, and this underlies the fact that there is no consistency in legislation across Europe. It also means that there is no consistency in the standards of iodization levels (11). Third, the necessity of awareness of iodine deficiency cannot be underestimated. With the visible signs of iodine deficiency a distant memory, the common belief is that the problem of IDD is solved. Finally, information on iodine

nutrition in the population is outdated. European public health officials need to remain vigilant in monitoring iodine nutrition and gathering data on urinary iodine excretion (12).

The way forward

Inasmuch as tremendous progress has been made in making salt iodization indeed universal and global, the fact still remains that 2 billion people worldwide are still at risk of iodine deficiency. Although universal iodization has stabilized and generally been sustained as a major public health intervention, 25% of households are not using iodized salt.

It is clear that the foundation of a USI program requires mandatory iodization and this can be achieved only when there is strong government commitment. In addition, in those countries which have existing USI programs, a reaffirmation—in the form of commitment of both human and financial resources for salt iodization programs—would not only assure sustainability but also mark the national ownership of the program and the goal. A leading advocacy effort directed at the health sector is the World Health Assembly's Resolution requiring regular reporting on iodine status. Member States last reported to the Assembly in 2013, and the next review would take place in 2016. This would be a prime opportunity for national governments to assess their monitoring capacity and take appropriate action to address gaps. It would also be an opportunity for governments to celebrate their achievements. Salt industry leaders also need to adopt salt iodization as part of their standard operating procedure in all facilities producing or processing salt for human and animal consumption.

There is no other activity that draws together the productive sector of society, the government sector, civic society and the general public such as iodine deficiency elimination does. Success with salt iodization will give the government, industry, consu-

mer groups and other stakeholders a new confidence to address other, more complex micronutrient problems using salt as well as other food carriers to deliver essential vitamins and minerals to the population.

The populations not yet reached with adequately iodized salt are often the more marginalized section of the population and in greatest need of protection. They are not reached by the mainstream of iodized salt supply but rather by the more informal sector of the small salt producers. This underlines the importance of integrating small salt producers into national USI programs. A number of working models, demonstrating initial success, exist. These models should be documented, reviewed and lessons learned shared so as to provide program guidance in areas where small salt producers have a significant role in the marketplace.

Just as the economics of the salt industry need to be understood in order to integrate salt iodization into the supply chain, active engagement of the processing food industry is necessary to include iodized salt in processed foods, especially in countries where processed foods dominate the household table.

A new strategy and advocacy are needed to bring IDD onto the European agenda. A renewed or alternative advocacy approach might be through building new awareness among the health authorities and the public in making iodized salt an informed choice.

Finally, a number of technical issues remain, both with reference to data gathering on iodine status, which is squarely in the domain of public health officials, and tools used to assess quality assurance, which holds more in the domain of the salt industry. Within the context of a changing global environment, new technological innovations, information systems, techniques, and accompanying training are needed to make the elimination of iodine deficiency a reality by 2020.

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