

# Global Nutrition Report: A strong case for salt iodization

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According to the 2018 Global Nutrition Report, micronutrient deficiencies impact a significant number of people around the world. Yet, there is far too little information on micronutrient status and deficiencies. More essential information and surveillance need to be gathered to make substantial progress on global targets.

Large-scale food fortification aims to improve nutrient intake by adding essential vitamins and minerals to foods that need to undergo some form of processing to get to market. It has been practiced for almost a century, starting in the 1920s with the voluntary fortification of salt with iodine in Switzerland and the U.S. The UK and Canada were the first countries to legislate for mandatory fortification of wheat flour and salt in 1940 and 1949, respectively. There have been significant advances in this area in recent years: 86 countries now require at least one type of cereal grain to be fortified with iron and/or folic acid (13 introduced legislation between 2014 and 2017), and 29 now have national programs to fortify edible oils with vitamin A (12 mandated legislation in this timeframe).

A systematic review of 41 reports and 76 research papers concluded that, in low and middle-income countries, there is strong evidence of health impact where food fortification achieved both high coverage and compliance (1). The most notable advance has been in the area of salt iodization. Table 1 shows that mean household coverage of iodized salt is 83% in the 52 countries for which there is data. The number of countries with mandatory salt iodization has steadily risen over time and is now 108 (Figure 1). Between 2014 and 2017, for example, six countries passed new salt iodization legislation (2). Based on available information on the use of iodized salt, the Iodine Global Network and UNICEF estimate that, globally, over 6 billion people now consume iodized salt (see Box).

**TABLE 1 Coverage of salt iodization**

Coverage/practice indicator	Number of countries with data	Minimum %	Maximum %	Mean %	Median % for countries with data
Household consumption of any iodized salt	52	18.0	99.8	82.7	90.9

Source: Kothari M, and Huestis A, based on 2016 Global Nutrition Report and UNICEF global databases, 2018. Notes: Data is compiled using STATcompiler and taken from country Demographic and Health Surveys for 2005–2017.

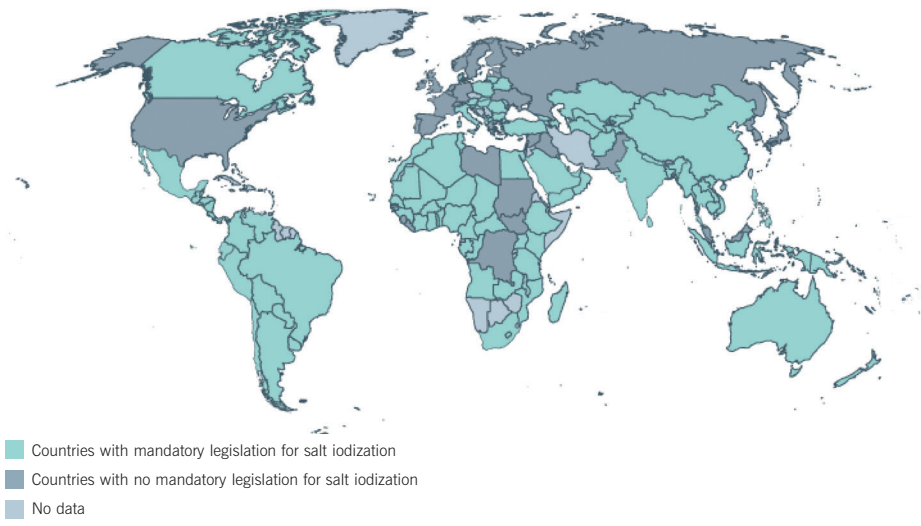
This represents the most significant achievement to date of large-scale food fortification (3).

### How many people in the world consume iodized salt?

UNICEF estimates that 86% of the population in low and middle-income countries has access to salt containing iodine. The population in these countries is 6.3 billion x 86% = 5.42 billion people using iodized salt. The Iodine Global Network estimates that the population in industrialized countries is 1.3 billion, and about half of the salt used is iodized, primarily in processed foods and condiments = 650 million people using iodized salt. Thus, the total is 6.1 billion people.

Salt iodization is credited with preventing 750 million cases of goiter over the past 25 years (4). Ethiopia is an example of national progress: in 2005, national coverage of iodized salt was 4.2% (5).

By the end of 2014, 95% of households had access to iodized salt (containing any amount of iodine), and 42.7% of households had access to adequately iodized salt (6). This was a result of a dedicated, multi-level and multi-sector effort involving public-private partnerships that focused on improving supply chains, engaging the private sector, reinstating public commitments to enforce iodization legislation and accessing technical assistance provided by international agencies.

**FIGURE 1** Country legislation for salt iodization

### Defining a successful fortification program

A recent review of national large-scale food fortification programs points towards a number of key lessons for success (7).

- They take into account how many people are malnourished and where they live, as well as what food they eat. Success depends on which food is fortified and how much of it is industrially processed.
- They integrate fortification into broader national nutrition strategies.
- National governments commit the requisite capacity, resources and sustained commitment for effective quality control.
- They carry out periodic reviews to check assumptions about dietary patterns.
- They mandate fortification to address a significant public health need or risk.

Yet a number of barriers keep large-scale food fortification from achieving its full public health impact. First, many countries with a high burden of hidden hunger have not yet started a fortification program. For example, 62 low and middle-income countries do not yet have mandatory wheat, maize or rice fortification programs, yet these meet the general criteria for establishing the intervention. Similarly, an appropriate selection of food vehicles – those regularly consumed by a large proportion of the population, particularly the most vulnerable people – coupled with effective compliance mechanisms will result in substantial increases in the potential impact of a fortification program (7).

Second, the quality and compliance of fortified foods must be strengthened and integrated into routine food control systems. One review of external quality assurance activities of staple food fortification programs from 25 countries found that the percentage of foods meeting national standards averaged between 45 and 50% (8). Similarly, surveys conducted in nine locations in seven low and middle-income countries between 2014 and 2017 found that coverage rates are not strong (7). On average only 35% of wheat flour consumed is fortifiable (industrially processed) in the nine locations and yet only 18.5% of available wheat flour was fortified. Nearly three quarters of people (72%) consume fortifiable edible oil but only 42% of all oil was fortified. For maize flour, 48% of people consume fortifiable maize but only 29% was actually fortified (7).

This low coverage coupled with poor compliance to national standards is arguably the most critical issue facing countries that are already implementing mandatory large-scale food fortification programs, because these will not achieve the intended health outcomes.

Third, most fortification programs have been treated as vertical interventions with limited alignment or harmonization. Although many of the same actors and stakeholders are involved with the fortification of different foods vehicles, the programs have not been linked to identify potential synergies and opportunities for greater efficiency in design, implementation and monitoring.

Lastly, few national program assessments have measured the impact of fortification on biological and functional (e.g. child development) outcomes (8).

### References

1. Osendarp SJM. Large-Scale Food fortification and Biofortification in Low- and middle-Income Countries: A Review of Programs, Trends, Challenges, and Evidence Gaps. *Food and Nutrition Bulletin* 2018, 39(2):175–205.
2. Global Fortification Data Exchange. Providing actionable food fortification data. Available at: [www.fortificationdata.org](http://www.fortificationdata.org)
3. Pearce EN et al. Global iodine nutrition: where do we stand in 2013? *Thyroid* 2013, 23(5):523–528.
4. Gorstein J et al. Estimating the impact of salt iodization on clinical iodine deficiency over the past 25 years. Submitted for publication, 2018.
5. Chuko T et al. Ethiopia's long road to USI. *IDD Newsletter* May 2015, Vol 43-2. Available at: [www.ign.org/cm\\_data/IDD\\_may15\\_1.pdf](http://www.ign.org/cm_data/IDD_may15_1.pdf)
6. IFPRI. *Global Nutrition Report 2016*. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI; 2016. Available at: [www.ifpri.org/publication/global-nutrition-report-2016-promise-impact-ending-malnutrition-2030](http://www.ifpri.org/publication/global-nutrition-report-2016-promise-impact-ending-malnutrition-2030)
7. Aaron CJ et al. Coverage of large-scale food fortification of edible oil, wheat and maize flours varies greatly by vehicle and country but is consistently lower among the most vulnerable: results from coverage surveys in eight countries. *J Nutr* 2017, 147(5):984S–94S.
8. Luthringer CL et al. Regulatory monitoring of fortified foods: Identifying barriers and good practices. 2015. Available at: [www.ghspjournal.org/content/3/3/446](http://www.ghspjournal.org/content/3/3/446)