

# GLOBAL DEVELOPMENT FINAL REPORT

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## I. Summary Information

### Grant Information

<b>Project Name</b>	Intensification of Business-Oriented Approaches towards the Global Elimination of Iodine Deficiency through Universal Salt Iodization		
<b>Organization Name</b>	GAIN and UNICEF		
<b>Grant ID#</b>	48965 (GAIN) / 48975 (UNICEF)	<b>Foundation Program Officer</b>	Senoe Torgerson
<b>Date Grant Awarded</b>	April 2008	<b>Project End Date</b>	March 2016
<b>Grant Amount</b>	\$39,998,865	<b>Project Duration</b>	8 years
<b>Report Period From</b>	1 April 2015	<b>To</b>	31 December 2015
<b>Report Due</b>	11 March 2016		
<b>Has this project been granted a no-cost extension?</b>	Yes		

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## Acronyms

CIF	Centralized Iodization Facility	PCA	Project Cooperation Agreement
COA	Certificate of Analysis	PDS	Public Distribution System (India)
DHS	Demographic Health Survey	PFSA	Pharmaceutical Funds and Supply Agency (Ethiopia)
ECOWAS	Economic Community of West African States	PPM	Part Per Million
EPA	Environmental Processing & Associates (Ghana)	QAQC	Quality Assurance/Quality Control
FDA	Food and Drug Administration	REACH	Renewed Efforts Against Child Hunger
FMHACA	Food, Medicine and Healthcare Administration and Control Authority (Ethiopia)	RTK	Rapid Test Kit
FMoH	Federal Ministry of Health (Ethiopia)	SAC	School-aged children
FNRI	Food and Nutrition Research Institute (Philippines)	SAARC	South Asian Association for Regional Cooperation
GAIN	Global Alliance for Improved Nutrition	SDG	Sustainable Development Goals
GPF	Global Premix Facility	SMART	Approach to setting program objectives: Specific, Measurable, Assignable, Realistic, Time-related
IDD	Iodine Deficiency Disorders	SUN	Scaling up Nutrition
IGN	Iodine Global Network	TAMACO	Tamaraw Salt Producers' Cooperative (Philippines)
KAP	Knowledge, Attitude and Practice	TGR	Total goiter rate
KIO <sub>3</sub>	Potassium Iodate	TOR	Terms of Reference
LTO	License-to-Operate	UEMOA	Union économique et monétaire ouest-africaine (West African Economic and Monetary Union)
M&E	Monitoring and Evaluation	UIC	Urinary iodine concentration
MDG	Millennium Development Goals	UNICEF	United Nations Children's Fund
MI	Micronutrient Initiative	USAID	United States Agency for International Development
MIS	Management Information System	USI	Universal Salt Iodization
MoU	Memorandum of Understanding	USI	Universal Salt iodization
MT	Metric Ton	WRA	Women of reproductive age
MUIC	Median urinary iodine concentration	WYD	Brand name of Salt Iodine Checker
MUSIC	Managing Communication for USI		
NCP	Nutrition Center of the Philippines		
PAHO	Pan American Health Organization		

## II. Project Final Results

### General Results

The Universal Salt Iodization (USI) Partnership Project was implemented from 2008-2015 in thirteen priority countries selected based on large population sizes unprotected against iodine deficiency. Over this period, there was an increase in the coverage of adequately iodized salt from 72.5% to 75.0% in these countries, which translates into an increased reach from 2.27 billion to 2.74 billion people, or an additional 466 million people now protected against iodine deficiency. This includes an estimated 18.2 million pregnant and lactating women, leading to the protection of newborn cognitive health, as well as 113 million children, aged 6 months to 15 years old who are no longer at risk of the debilitating effects of iodine deficiency. At the same time, the coverage of the population with salt containing any iodine increased from 85.2% to 89.8%, reaching an additional 606 million people (from 2.67 billion to 3.27 billion people). Iodine status updates since the start of project were available for at least one age group in ten Partnership countries. For all seven countries where data were available for school-aged children at the end of the project, the median urinary iodine (MUI) indicated adequate iodine status, while in the six countries with data on women of reproductive age, the iodine status was optimal in four. As a result, women in these settings now enter pregnancy with improved iodine stores, which supports iodine supply to the developing fetus.

Over the grant period, the Partnership had to adapt its strategies to new programming contexts. To illustrate, the Partnership focused its efforts at the outset on increasing the overall supply of adequately iodized salt and coverage at the household level. However, it became apparent that even in the predominantly low- and middle-income countries covered by the grant, increasing proportions of salt were being consumed through processed foods and condiments, thus requiring these sources to be considered and monitored alongside household salt in national iodine programs. Data from China supported that not only deficient, but also excessive intakes of iodine need to be avoided. As a result, the Partnership shifted its focus from merely preventing deficient iodine intakes to optimizing iodine intakes. In turn, this informed many of the monitoring and communication activities that were subsequently designed as part of the project, as well as the project metrics. Finally, with a changing global nutrition landscape, the Partnership had to position iodine nutrition programs in a broadening and increasingly multi-sectoral nutrition agenda.

In fact, the Partnership was able to provide the required stewardship for iodine nutrition at the global, regional, and country levels in the context of the changing programming environment. As a sign of this leadership, the Partnership was able to generate and disseminate over 110 papers, publications and technical presentations on priority topics on iodine nutrition. Other achievements (presented by programmatic category) are outlined below and elaborated on in this report.

### Achievements at the global level

#### Enabling environment:

- Harmonized the global iodine architecture and interagency coordination through the creation of the Iodine Global Network (IGN) merging ICCIDD and the Iodine Network to help support sustainability and providing a global leadership moving forward
- Aligned salt iodization and salt reduction programs, in collaboration with the WHO, to ensure that both programs can achieve their stated goals
- Facilitated linking of USI to the SUN agenda through frequent meetings with the SUN Secretariat, the SUN Business Network and SUN country focal points

#### Supply:

- Increased the supply of adequately iodized salt to an additional 466 million persons in project countries through the delivery of state-of-the art and sustainable approaches to supply-related program elements
- Improved the quality and cost of  $KIO_3$  by aggregating demand across programs and procuring only from approved suppliers

- Developed, established and disseminated global good practice guidelines on quality assurance/quality control (QA/QC) and related training modules to improve capacity of government and private sector to adequately iodize salt

#### Communications/advocacy:

- Developed and disseminated novel tools and methods to improve communications along the salt supply value chain, including the managing USI communication (MUSIC) tool
- Prompted multinational companies to routine use iodized salt in the production of their processed foods and condiments
- Supported the [#FutureFortified Global Summit](#), the first ever global event on Food Fortification, to improve the positioning of food fortification (including salt iodization) in national nutrition and development plans

#### Monitoring and research:

- Identified global monitoring needs for iodine nutrition programs and developed a prioritized list of action points that will lead to refined performance measurement and improved linkages to data-informed decision making
- Demonstrated through research that the range of optimal iodine intakes among school-aged children is wider than previously recommended, thus providing program managers with greater flexibility to address the iodine needs of different demographic target groups
- Showed through research that USI can meet the iodine needs of infants, toddlers, and pregnant and non-pregnant women, which is a powerful advocacy argument in favor of salt iodization
- Designed and implemented the iodine module in NutriDash, the first global output-level program monitoring tool for salt iodization, and which enables the identification of priorities for program improvement
- Developed and tested new tools to measure the consumption of iodized salt and permit disaggregation of results by vulnerable population using a multi-dimensional poverty index
- Supported the design, field testing and patenting of a new paper strip method to semi-quantitatively measure iodine in salt (saltPAD) for future program monitoring

#### **Achievements at the regional level**

- Addressed policy gaps through the regional framework for nutrition in the South Asian Association for Regional Cooperation, developed regional standards for the Economic Union of West African States (UEMOA) and the Economic Community of West African States (ECOWAS), and informed regional program strategies through regional review of salt legislation in East Asia and the Pacific
- Implemented a series of five regional USI workshops with participants from 45 countries to provide advocacy support and technical assistance for salt iodization and to identify priority programmatic actions
- Organized workshops in Eastern Europe to promote awareness about the importance of using iodized salt in processed foods and in North Africa to strengthen quality assurance/quality control

#### **Achievements at the country level**

##### Enabling environment:

- Accomplished key updates to national legislations, such as in India to maintain the ban on the sale of non-iodized salt, in Ethiopia to re-establish mandatory regulations, in Niger to limit importation of non-iodized industry salt leaking into markets, and Senegal to achieve alignment with sub-regional standards
- Helped refine national and provincial salt iodization standards in China to achieve optimal iodine status according to Provincial contexts
- Supported integration of IDD into National Medium Term Development Plan in Indonesia, creation of a single coordination body responsible for overseeing all national fortification

efforts (including salt iodization), and development and implementation of district-level implementation models

#### Supply:

- Improved quality iodization, QA/QC manuals, training on sampling and testing as well as better iodization technology was provided in eight countries based on need
- Ensured sustainability of KIO<sub>3</sub> supply by facilitating the elimination of external subsidies in Pakistan, Bangladesh and Ethiopia, where KIO<sub>3</sub> is now being supplied to the industry at its actual price with cost-recovery systems in place
- Developed viable cost recovery models for KIO<sub>3</sub> procurement and distribution in Ghana and Ethiopia
- Increased the annual production of iodized salt by 115,000 metric tons in Ethiopia alone
- Increased access to iodized salt by low income consumers through the public distribution system (PDS) in India and in China, where iodization subsidies were provided to low coverage areas of Qinghai, Xinjiang and Tibet
- Developed and established management information systems (MIS) for monitoring the supply of iodized salt in India and Egypt

#### Communications/Advocacy:

- Increased capacity and experience of national USI coordinating bodies across the partnership countries to sustain USI implementation processes with only periodic technical support provided by the regional and global levels
- Ensured political commitment that has resulted to increased domestic investment in USI as demonstrated by the ten Partnership countries that have at least partially transferred the costs and effort of sustaining USI coordination bodies and implementing the regulation to domestic sources
- Helped assuage concerns over increases in thyroid cancers as a result of salt iodization in China

#### Monitoring and research:

- Addressed crucial data gaps through national end-of-project surveys and collection of other programmatically relevant data to understand the main determinants of salt iodine levels and iodine status
- Helped build capacity of national agencies to improve the monitoring of their iodine programs, particularly in Bangladesh, Egypt, Ghana, India and Senegal, where the Partnership supported comprehensive end-of-project surveys

As the Partnership comes to a close, the path has been laid to continue efforts towards the sustainable achievement of optimal iodine nutrition and the prevention of iodine deficiency. While there were sustainable accomplishments in most countries and significant technical advances across the portfolio, the progress was not as pronounced as expected in some countries. This was due to the changing context and enabling environment in the countries where the Partnership worked, e.g. lack of political support and conflict (Russian Federation, Ukraine, Egypt), climate change and food security (Ethiopia, Niger), fragmented industry (Ghana, Senegal) and led to the establishment of more realistic goals for some activities, such as the viability of salt iodization by small-scale producers. Going forward, there are several constraints which will need to be addressed in order to ensure long term sustainability of these national iodine programs. We identified clear areas where attention is still required, including motivating stronger government commitment by linking iodine to national nutrition and development priorities, further strengthening of regulatory monitoring systems as part of broader food control, and refining performance measurement systems and metrics to improve the timely utilization of data for program improvement. These activities should aim to better understand the dynamics of salt consumption in countries, including the use of iodized salt by the food industry, and how it changes over time to inform where programmatic adjustments are required. Finally, more robust tools and programming is needed to identify marginal groups and ensure that they achieve optimal iodine status.

GAIN and UNICEF are deeply grateful to the Bill & Melinda Gates Foundation for the generous support and oversight of the USI Partnership Project. The foundation played a critical role from the initial conceptualization of the project through all stages of implementation, enabling tremendous flexibility and willingness to adapt to the changing program environment.

Although there were challenges because the two agencies had different operational structures, these were resolved early on in project implementation. The complementarity between GAIN and UNICEF provided the Partnership with a set of proficiencies that neither organization could have delivered independently. GAIN was able to focus on innovative solutions in the salt industry and food control sectors to improve supply, bringing experiences from other sectors to the table, while UNICEF leveraged its policy and advocacy power to speak to national and regional leaders, and applied innovations in communications. Both organizations helped deliver cutting-edge research, helped improve metrics as well as monitoring of progress in program delivery. This collaboration translated to improved implementation and overall success of the project and contributed towards the sustainable elimination of iodine deficiency.

### Key Milestone Tabs

An updated milestone chart is embedded in the narrative section of this report with a designation of progress achieved against the five primary activities and respective sub-activities as having been completed or on target.

### Global Level Activities

#### Activity 1: **Project Coordination & Management - Provide Overall Project Coordination and Management**

	Start-End Dates	Milestone status
<b>Primary Global Objective:</b>		
<b>Activity 1 - Project Coordination &amp; Management</b>		
<b>1.1 Identify and recruit overall project coordinator</b>	4/08-6/08	
<i>Core management staff recruited</i>		Completed
<i>Focal points hired</i>		Completed
<b>1.2 Constitute Steering Committee and meetings</b>	4/08-12/15	
<i>Steering Committee formed</i>		Completed
<i>Steering Committee meetings conducted (one face-to-face, one videoconference)</i>		Completed
<b>1.3 Ongoing Project Coordination and Management</b>	4/08-12/15	
<i>Management Team meetings - monthly conference calls and one face-to-face meeting</i>		Completed

There were annual Steering Committee meetings which helped guide and support the Project over its duration. Reports of the Steering Committee meetings have been archived and are available<sup>1</sup>. Reports of the Project Annual Reports have been archived and are available<sup>2</sup>. A Senior Management Team, consisting of representatives of each agency and a Global Project Coordinator held meetings to review progress, identify challenges and bottlenecks at the global and national level, and formulate corrective actions. Calls were conducted between the Senior Management Team and the country teams as required to track project implementation. In the fourth year of the Project, two Regional Strategic Workshops were undertaken with government, industry, and partner stakeholders to jointly review country strategies and progress achieved towards USI and project goals<sup>3</sup>. The Workshops enabled teams, made up of GAIN and UNICEF staff together with key country stakeholders and partners, to identify programmatic constraints, develop revised SMART objectives, and find solutions to address cross-cutting issues. In addition, the Workshops helped the Partnership identify countries in which there was a likelihood to achieve greater results with additional funding. This led to a reallocation of funding between countries and a revision of the targets for each country, based on an estimated household coverage of adequately iodized salt, which remained a key metric for the project

**Activity 2: Global Supply - Provide overall guidelines to strengthen and support private sector in regard to the global salt iodization programs.**

	Start-End Dates	Milestone status
<b>Primary Global Objective:</b>		
<b>Activity 2 - Global Supply</b>		
2.1 Establish criteria to define industry participants	1/09-3/09	
Salt industry criteria to guide program design and implementation are defined		Completed
2.2 Establish guidelines for regulatory monitoring, QC and QA	1/09-12/15	
Toolkits and guidelines for regulatory monitoring developed		Completed
Roster of technical consultants available		Completed
Documentation of best practices and lessons learned with respect to regulatory monitoring		Completed
2.3 Support global dissemination of KIO <sub>3</sub>	4/08-3/15	
Materials available for public disclosure on sources of KIO <sub>3</sub> through web sites		Completed
2.4 Establishment of a Global KIO <sub>3</sub> procurement facility	10/08-6/09	
Global premix facility developed and available		Completed
2.5 Establishment of a Business model for the consolidation of small-scale salt producers	10/09-3/11	
Business model developed with description of variations to different settings		Completed

**Regulatory monitoring and QA/QC (Activity 2.2)<sup>4</sup>**

Building national internal (industry) and external (government) QA/QC systems has been a major priority of the Partnership Project. The focus was primarily on training on good practice and addressing specific weakness in existing national QA/QC systems. First, in 2012 the Partnership completed a comprehensive QA/QC good practice manual with training modules for producers and regulatory agencies. It was presented in workshops to industry and regulatory authorities in eight target countries in 2013. Second, 80 salt producers were provided more intensive support on QA/QC in six countries (Bangladesh, Egypt, Ethiopia, Ghana, Indonesia and Pakistan) selected based on need and factory assessments were completed. Third, in order to improve analytical capacity, 30 i-checks (>1000 reagent vials) and >20 WYD units were distributed and 50 salt producers and 30 regulatory agency personnel trained on these as well as titration. Fourth, to improve iodization processes in Ethiopia, Indonesia and India, technical support and in-kind donation of equipment upgrades (pumps, mixing systems, overall process improvement) were provided. Lastly, extensive technical support to the Salt Department in India and to the government of Egypt was provided to develop and mainstream Management Information Systems (MIS) for improved regulatory monitoring of iodized salt.

**Support to improved and viable supply of quality KIO<sub>3</sub> (Activity 2.3 and 2.4)**

**Direct supply** - Since the start of the Partnership Project in 2009, more than 200 metric tons (202,615 kg) of GPF quality-assured KIO<sub>3</sub> was delivered to 11 countries. By aggregating demand across entire countries and regions, and launching competitive tenders, price reductions were achieved. For example, in Bangladesh, the client informed GAIN that each order of KIO<sub>3</sub> procured through the GPF was at least seven percent less costly than its previous orders.

**Technical Assistance for Improved Delivery of KIO<sub>3</sub>** – The GAIN Global Premix Facility (GPF) and UNICEF (Copenhagen Supply Division) monitored the prices, alerted country managers on price spikes and provided specific technical support where needed. For example, the Partnership relied on Roskill's annual reports on global industry market rates and outlooks for iodine to provide updates on iodine prices and forecasts. After the March 2011 earthquake and tsunami in Japan there was a 60% increase in the price of KIO<sub>3</sub>. At this time GAIN, UNICEF, the Iodine Network and the Micronutrient Initiative all received requests from countries asking for assistance in understanding the supply of KIO<sub>3</sub> as well as for financial support for procurement. The Partnership, the Iodine Network and MI responded by jointly disseminating widely to stakeholders in the Partnership countries a guidance note on the global supply of KIO<sub>3</sub>, the pricing structure, and list of contacts for quality-assured and cost competitive KIO<sub>3</sub>.



Concurrent to this rapid increase in costs of  $KIO_3$ , the Partnership began establishing national, viable models for  $KIO_3$  procurement in Ghana and Ethiopia as well as providing technical assistance to Bangladesh. This resulted in established models and revolving funds in Ghana and Ethiopia which forecast demand; recover costs to replenish stocks from approved suppliers; and effectively distribute stock. The hosting institutions running these national models are the Environmental Processing & Associates Ltd (EPA) in Ghana and the Pharmaceutical Fund and Supply Agency (PFSA) in Ethiopia.

*Development of models to support small-scale salt iodization (Activity 2.5)*

The Partnership made investments to examine how to ensure that salt from the small-scale sector can be adequately iodized, or iodized at all. The Partnership concluded that an enormous investment of time and resources are required to iodize among the small-scale industry and the viability of those efforts are questionable. The Partnership worked in Ghana, Senegal, and the Philippines to develop innovative models which consolidated the small-scale segment of the salt industry to overcome operational challenges and key lessons were learned regarding critical success factors for long term viability. The main lesson learned from this work is that subsidized small-scale iodization can ensure delivery of quality iodized salt from the small-scale industry. However, establishing viable, non-subsidized small-scale iodization programs require robust government enforcement which is generally prohibitively resource intensive and not observed in practice in the target countries. Efforts moving forward should be shifted towards supporting industry consolidation (as is happening in India, Bangladesh and Ethiopia). The Partnership believes that the consolidation of individual salt farmers and small-scale salt producers into larger entities could be effective by achieving efficiencies of scale and providing financial benefits to producers and processors.

*Exploration to better understand and promote the use of iodized salt in processed foods (Activity not in original proposal)*

The Partnership collaborated with local market research companies to design and implement country-specific market research to assess shifts in salt consumption patterns and determine the extent to which iodized salt is used in processed foods, the reasons why food companies use iodized or non-iodized salt, and where possible, to model the current and potential contribution to iodine intake in Bangladesh, China, Egypt, India, Indonesia, Philippines, and Ukraine. The Partnership also supported technical research on iodine retention and effect on the organoleptic properties of food in Senegal (bouillon) and Russia (bread) for advocacy purposes. These research reports are listed in the publication section of this report (Annex 1). The key results of this work included:

- With the exception of Russia and Ukraine, the Partnership's original assumption that food industries generally used non-iodized salt as a default was largely incorrect. Neither the food industry as a whole, nor its sub-sectors (e.g. instant noodles, sauces, bread), procures all iodized or all non-iodized salt. The preference to use iodized or non-iodized salt varies by company (Indonesia and the Philippines). National legislation and supporting regulation is subject to awareness by and interpretation of individual companies.
- In general, large scale food industries require high quality salt which may be imported if the quality of domestically produced salt is not considered acceptable. The iodine level of imported salt has been found to vary depending on national regulations and the food industry order. The Partnership noted that a majority of processed foods from local, informal producers (salted fish in Indonesia and Philippines, salted snack mixes and bread bakers in Bangladesh, Pakistan, and India, Baladi bread in Egypt) use salt from the local market. In these cases, the quality of iodization of the salt supply at the national level directly impacts the level of iodine in the salt used by the local food industry.
- Simply sensitizing large national and multi-national food companies to the importance of iodine nutrition may not be sufficient to incentivize them to switch to iodized salt. Regulations including standards and labeling instructions for specific food items need to clearly specify to use iodized salt in order for food companies to fully comply. The Partnership worked with several food companies, such as UNILEVER in Nigeria and Kraft in Egypt to ensure the use of iodized salt in their products, while others, such as IndoFoods in Indonesia and Nestle globally have pursued this policy on their own volition.



Based on these experiences, the Partnership translated this knowledge into programmatic adjustments and placed increasing emphasis on supporting countries in the use of adequately iodized salt in processed foods, adjusted the project monitoring framework and developed revised program guidance.

**Activity 3: Global Advocacy - Harmonize global efforts to support USI, including the coordination of activities and resource mobilization**

	Start-End Dates	Milestone status
<b>Primary Global Objective:</b>		
<b>Activity 3 - Global Advocacy</b>		
3.1 Global advocacy with donors, transnational industry, civil society	10/08-12/15	
Additional donor resources leveraged		Completed
Increased awareness of iodized salt through partnering with the salt industry		Completed
3.2 Global consensus on salt iodization and sodium reduction communication strategies	12/09-3/10	
Global consensus on how iodized salt awareness raising and sodium reduction efforts link and are synergistic		Completed
3.3 Coalition and network-building	4/11-12/15	
Global efforts to strengthen networks consolidated		Completed
Joint country collaboration plans developed between the Partnership and other agencies		Completed
3.4 Support Comprehensive and Integrated Fortification	4/10-12/15	
Global and regional stakeholder consultations conducted		Completed
3.5 Support development of integrated communications and advocacy strategy	4/11-12/15	
Lessons learned, innovations and good practices are documented and disseminated		Completed
Consolidated strategic communications is developed		Completed
3.6 Support harmonization of regional trade and standards	4/11-3/13	
Regional workshop on trade and harmonization of standards held and results disseminated		Completed

*Global advocacy with donors, transitional industry, civil society (Activity 3.1)*

The Partnership helped transform the role of the IGN to serve a harmonizing function and ensure strong cohesion between key stakeholders. This has enabled better coordination and ensured that there are consistent messages in the technical support which is extended to country programs. Partnership support was leveraged to secure a review and endorsement by GiveWell which recognized salt iodization as an evidence-based strategy and the IGN and GAIN as recommended charities.

Building on the Partnership work, UNICEF at the global level was able to leverage additional resources from USAID to support USI at the global, regional and country levels. The funding contributed to filling knowledge gaps and strengthen the global iodine architecture through support to the IGN. This assistance included a series of regional workshops undertaken in 2015 to review USI program implementation with 45 countries, facilitate sharing of lessons learned and develop revised action plans which address emerging issues in the USI program environment. The workshops encouraged broad inter-agency collaboration and involved, the MI, WHO, WFP as well as UNICEF and GAIN to support the development of regional and country specific actions to improve USI program and enhance structural changes to ensure sustainability. Key lessons learned and experiences from the Partnership Project largely informed the content of the workshops.

*Global consensus on how iodized salt awareness raising and sodium reduction efforts link and are synergistic (Activity 3.2)*

The Partnership made major contribution to the harmonization of salt iodization and sodium reduction efforts, which led to consensus statements on the importance of aligning the two strategies and to ensure that there is no conflict in their relative promotion. The Partnership provided input to a WHO/PAHO consultation to consider how collaboration and synchronization of programs for salt iodization and dietary salt reduction could achieve a common goal – the optimal intake of sodium and iodine to be of greatest public health benefit<sup>5</sup>. The Partnership also helped produce publications, including the [“Salt Reduction](#)

[and Iodine Fortification Strategies in Public Health” report](#), and supported a session at the Micronutrient Forum to explore synergies and describe recent country-level experiences with USI and salt reduction. The Partnership included the collection of urinary sodium in two national surveys (India and Senegal) to enable future monitoring of trends in sodium intake and the relationship with urinary iodine and provide an evidence base for alignment of USI and sodium reduction strategies.

#### *Coalition and network building (Activity 3.3)*

In addition to transforming the role of IGN to ensure strong cohesion among stakeholders, the Partnership engaged other global networks working in micronutrients such as the Micronutrient Forum, Food Fortification Initiative and Home Fortification Technical Advisory group to ensure better harmonization and explore opportunities for stronger collaboration and program linkages at the global, regional and national levels.

At country level, the Partnership devoted considerable time and effort to supporting the political, administrative and logistical efforts required to adapt national coordinating bodies to on-going government reforms, shifting roles of public agencies and other the changes USI program environment government, industry and civil society stakeholders. Typically, these national coordination bodies develop amendments to regulations, conduct policy advocacy and sometimes coordinate public education campaigns and program monitoring. In most countries (with the exception of Russia, Ukraine) these are now formal officially sanctioned bodies with supporting staff and operational budgets. At the end of the project, many countries report the costs and effort of sustaining these coordination bodies has been at least partially transferred to domestic sources. Equally important, advocacy from USI coordination bodies ensured appropriate language relating to IDD and USI was included in a range national development, health, food security and nutrition policy documents. Sustaining these platforms has been and will be a key to monitoring changes in the program environment and responding to potential threats to sustaining USI.

#### *Support comprehensive and integrated fortification (Activity 3.4)*

At the start of the project, USI was largely a ‘vertical’ approach. The Partnership has contributed to transforming this situation to have USI mainstreamed in the broader food fortification agenda. For example, the Partnership ensured that USI was part of the broader fortification agenda as demonstrated at the first-ever [#FutureFortified Global Summit in September 2015](#). In addition, the Partnership worked through Scaling up Nutrition Movement (SUN) Business Network, to convene stakeholders such as donors, industry and civil society to advocate for integration and harmonization between USI, food fortification and national nutrition planning.

#### *Support development of integrated communications and advocacy strategy (Activity 3.5)*

In order to ensure that USI doesn’t fall off the national development agenda and attracts both domestic resources as well as international donor support, the Partnership supported various advocacy activities that led to positive results. To illustrate, most of the Partnership countries have now integrated USI into domestic iterations of global initiatives such as MDG/SDGs, SUN and REACH, as well as domestic policy documents. For example, Indonesia not only worked to elaborate a National Plan for the Control of IDD 2011–15 but also ensured USI was included in objectives and strategies of the National Medium Term Development Plan 2010–14 and 2015–19 and the National Plan of Action on Food and Nutrition for 2011–15. The integration of USI into national development agenda has not only ensured political commitment but also resulted to increased domestic investment in USI as demonstrated by the ten Partnership countries that have at least partially transferred the costs and effort of sustaining USI coordination bodies and implementing the regulation to domestic sources.

The Partnership also identified regulatory obstacles to reaching USI and requiring review and amendment of the original legislative and regulatory instruments. Through advocacy with policy makers, five Partnership countries have successfully updated or drafted new USI laws in order to address major policy and regulatory environment barriers.

Communication assessments were conducted in all Partnership countries and found that after initial successes achieved via mandatory legislation, industry advocacy and broad national public awareness campaigns, the remaining work to extend coverage required better alignment with the domestic salt industry and market place. Therefore, the Partnership designed and disseminated a suite of tools to assist countries program planners in applying audience segmentation and other strategic communications

approaches to this supply-side environment. Managing USI Communications (MUSIC) provides a step-by-step data-driven framework to help national programmers to: identify sectors of the salt industry and supply chain; define what proportion of the national salt supply is produced and/or distributed by each sector; and apply program monitoring data to estimate the proportion of salt from each industry sector that is adequately, inadequately or not iodized at all. Based on this supply side analysis, national programs develop realistic objectives based MUSIC’s tripartite supply-side segmentation: sustaining currently iodized well-iodized salt; improving iodization to reduce the current share of inadequately iodized salt; and expanding iodization to industry segments not iodizing at all. Based on these objectives, resources and financing can be logically and transparently apportioned based on gains in USI coverage anticipated from each segment. While initially national USI programs considered wide consumer oriented mass media campaigns to raise consumer awareness and demand – to “pull” producers towards quality iodization – current strategies emerging from the MUSIC supply-side framework and analysis deliberately target actors working in the salt supply chain.

*Harmonization of regional trade and standards (Activity 3.6)*

At the outset of the project, the Partnership identified regional specific priority actions related to legislation, standards and trade. In the South and East Asia and Pacific Regions, a review of national legislations was deemed as a priority due to weak enforcement. The UNICEF Regional Office led an extensive review of legislation in 23 countries. The results were used to stimulate reviews at the national level in several countries and led to the re-establishment of mandatory legislation in several countries.

For the South Asia region, this analysis helped inform the development of the Regional Action Framework on Nutrition, which provides guidance to the eight member countries of South Asian Association of Regional Cooperation (SAARC). Among the items included in the SAARC nutrition framework is the harmonization of food fortification laws/policies and monitoring cross border trafficking of non-iodized salt.

In the West Africa region, the Partnership collaborated with regional economic bodies to develop harmonized regional standards Economic Union of West African States (UEMOA) and the Economic Community of West African States (ECOWAS), and helped develop and roll out a regional a guide on good production practices of iodized salt (*‘Guide de bonnes pratiques de production de sel iodé dans la zone UEMOA’*).

In Eastern/Southern Africa, this was not a major focus, but as a first step the Partnership worked to strengthen regional bodies.

**Activity 4: Global Evidence and Results - Develop a Performance Measurement Framework and Capacity to Ensure Standardization across Countries, Improved Rigor of Data to Inform Decision-Making and Guide Program Implementation**

	Start-End Dates	Milestone status
<b>Primary Global Objective:</b>		
<b>Activity 4 - Global Evidence and Results</b>		
<b>4.1 Develop Performance Measurement Framework</b>	4/08-12/10	
Performance measurement framework for USI project established		Completed
Toolkit for implementing framework developed		Completed
<b>4.2 Build and maintain TA consultant roster</b>	4/10-3/13	
Consultant roster developed		Completed
<b>4.3 Development of Informed Program Guidance for the Elimination of IDD</b>	4/10-12/15	
Task Force on IDD convened and recommendations prepared for revised guidelines		Completed
White paper on monitoring performance of USI and contribution towards iodine status		Completed
Conduct special studies to increase evidence base on USI /IDD monitoring		Completed

*Development of Performance Measurement Framework (PMF) (Activity 4.1)*

Over the course of the Partnership project, the key indicators of program performance were developed, and subsequently adjusted in order to align with shifting program focus and priorities. While the core project performance indicator remained the coverage of household iodized salt, there was an increased emphasis on assessing other sources of iodine in the diet. The Partnership regional review workshops

which took place in 2012 enabled countries to review the original PMF paradigm and examine where changes were needed to make program adjustments and set priorities on those activities which would lead to the largest increase in the supply of adequately iodized salt. The Partnership work on the PMF informed the development and refinement of the iodine module of the Nutrition Dashboard database (see below).

### *Development of Informed Program Guidance (Activity 4.3)*

The Partnership was deeply committed to improve the rigor of program monitoring and review existing performance metrics. It convened a special Iodine Task Force (ITF) to examine new and emerging knowledge which had implications for the way IDD elimination programs were designed, implemented and monitored. The ITF examined a broad set of issues and included participation and collaboration amongst key partners. The experience of the Partnership contributed to this work on many technical issues, but particularly in clarifying the tools and indicators employed to track USI programs, including enhanced regulatory monitoring. A Partnership-led workshop held in 2015 identified a series of recommended priority research topics which will provide inputs into refined performance measurement and improved linkages to data-informed decision making, including an update to the World Health Organization (WHO)/UNICEF/IGN manual on 'Achieving Optimal Iodine Nutrition: A Manual for Health Programme Managers.'

**Conducted Special Studies to Generate Scientific Evidence** – The Partnership was strategic in supporting a small portfolio of critical research studies that helped increase the evidence on USI and iodine nutrition. With limited resources, the Partnership supported three critical studies relating to:

*Cut-off points for the classification of iodine status* – Supported ETH and the IGN to implement a multicenter study to propose a revised range of Median UIC values for the classification of optimal iodine status amongst school aged children (SAC). This study, based on changes in the thyroglobulin level at different UIC values to indicate low and excessive iodine intake, led to recommendations of an extended range of UIC. Previous global recommendations had been too restrictive and led to the erroneous interpretation of excessive intake in populations.

*SIMPLIFY* – The Partnership conceptualized a study with ETH and supported a team of investigators to undertake a study to assess whether Salt iodization could meet the needs of pregnancy, lactation and infancy, while maintaining iodine status among WRA and SAC within the optimal range. Data were collected from study sites in China, Croatia and the Philippines to examine whether USI can meet the physiological dietary requirements of these critical groups in the first 1,000 days without causing excessive iodine intake in school-age children and non-pregnant, non-lactating women. Preliminary findings indicate that salt containing an average iodine level of 25 ppm provides adequate iodine intake to the general population and meets the physiological iodine requirements in infants, toddlers, pregnant and non-pregnant women, and a paper is being finalized.

*Development of models to determine sources of dietary iodine* – Using data from Senegal, India and Kenya, the Partnership supported analysis of urinary sodium, urinary iodine and household salt iodine content to estimate the contribution of the three major iodine intake sources to iodine status, namely:

- native dietary iodine intake (iodine intake from the native iodine content in common diets)
- food salt iodine intake (iodine intake from iodized salt in commercially purchased food) and
- iodine intake from the use of household iodized salt

Preliminary findings suggest that, despite the focus by regulatory agencies in Senegal and India on consumer salt, a considerable part of the population's iodine status nevertheless depends on the use of iodized salt by food manufacturers, catering and restaurants. Also, the observation of relatively low level of naturally occurring iodine in the diet reinforced the fact that without a well implemented salt iodization policy, the iodine status in both countries would revert to being deficient (<100µg/L, the agreed cut-off for iodine deficiency).

**Nutrition Dashboard** - The Partnership recognized that even though more resources are being deployed to support nutrition programs globally, routine data systems for salt iodization and other key nutrition interventions at country levels remain weak and data compilation and analysis at global levels insufficient. To respond to the data gap on the performance of salt iodization programs, UNICEF and GAIN worked

together to create the NutriDash reporting system in 2013. This web-based database builds on and expands previous efforts to strengthen nutrition information systems and collate country-level program output data in an effort to identify priorities for program adjustments. At Headquarters level, UNICEF and GAIN helped develop the original reporting system and refined the tool before its application in 2014. At country levels, the Partnership led the collection of required data with their government counterparts; as needed, the Partnership liaised with national IGN coordinators in the data collection process.

**Analytics for improved monitoring** – The Partnership supported the University of Notre Dame to develop a paper test strip that can semi-quantitatively measure iodine in salt, to be used in low-resource settings for QA/QC and routine monitoring more precisely and affordably. Internal laboratory validation showed positive results for precision and accuracy and field testing was carried out in Mombasa, Kenya which demonstrated impressive performance.

**Development of a flexible Management Information System (MIS) to monitor National USI programs** The Partnership supported the development of an MIS tool to track salt production and salt iodization in India and Egypt, including data on overall supplies and results of regulatory monitoring, as well as to map iodized salt and distribution and results from household iodized salt coverage surveys.

### National level:

### Activities 5-10: National Level Coordination, Planning, Implementation and M&E

	Start-End Dates	Milestone status
<b>National Component Objective -Project Coordination and Management</b>		
<b>Activity 5 - National Level Coordination</b>		
5.1 Conduct situational assessment of countries	9/08-9/09	
Country reviews completed in all countries		Completed
5.2 Develop national strategy plans for each country	3/09-12/10	
National strategies developed in all countries		Completed
5.3 Develop bi-annual Partnership work plans and establish management oversight function	4/10-3/15	
National workplans developed in line with strategy / progress reviewed annually		Completed
Quarterly conference call between Management Team and Country Teams		Completed
5.4 Ensure operational implementation and financial modality mechanism	4/10-3/15	
Capacity and operational structure to implement activities		Completed
Smooth implementation and achievement of national milestones (annual reports of performance)		Completed
<b>Activity 10 - Strengthen M&amp;E capacity</b>		
10.1 Develop and implement national M&E plans, including ongoing support	7/09-3/11	
Country M&E plans completed		Completed
Regional workshops completed		Completed
10.2 Conduct periodic sub-national coverage (shift KAP to Activity 8)	4/10-3/12	
Surveys completed		N/A
Results collected and report disseminated		N/A
10.3 Capacity building and strengthening of national counterparts	4/10-3/14	
Regional and National training and support provided		N/A
10.4 Conduct baseline and endline surveys of IS coverage, UI and other sources of iodine in diet	4/09-12/15	
Portfolio analysis completed of priority surveys		Completed
Baseline surveys completed		Completed
Endline surveys completed		Completed

The main thrust of the Partnership work was the support provided to strengthen national USI programs in sixteen countries, which included the original thirteen Partnership countries, and the addition of three countries in 2013. This section provides a summary of activities and achievements in each of the Partnership countries. More detailed reports with executive summaries for each of the Partnership countries are provided as Annexes 2 and 3 of this report.

## Project sustainability

The Partnership defined sustainability as the capacity to ensure the supply and distribution of adequately iodized salt at a level that will maintain optimal iodine status among target populations. The Partnership views this capacity as a function of both continued external support to national iodine programs and improved institutionalization (i.e. integration of IDD elimination measures into national budgets and action plans, followed by adequate execution of planned activities).

Both GAIN and UNICEF have undertaken efforts to mobilize continued donor support for IDD elimination and achievement of optimal iodine nutrition. Some success has been made, as evidenced by some support from GiveWell and USAID offered to GAIN and UNICEF, respectively. As another measure to ensure continued external support to national iodine programs, the Partnership played a strong role in the creation of the IGN as the major global coordination structure on IDD elimination. The Partnership provided in-kind and financial support to the IGN Secretariat and has facilitated the development of its new strategic plan in an effort to establish a viable organization. With a view to the future, both GAIN and UNICEF have integrated budget lines related to IDD elimination into pending funding proposals. However, it remains uncertain whether these proposals will be successful in meeting the organizations' financial needs to continue their support to IDD elimination globally.

Over the project period, the Partnership has worked closely with governmental agencies with the goal of strengthening national structures. As a result, the Partnership has helped to build capacity and expand awareness of national program managers, regulatory bodies, and policy makers. Likewise, the range of support offered to salt producers is expected to have lasting benefits. The establishment of global monitoring systems such as NutriDash will enable the agencies to prioritize support needs for country programs. The Partnership has also helped to shape the global agenda on food fortification (including salt iodization) through the 2015 [#FutureFortified Global Summit](#) led by GAIN and the Government of Tanzania, and co-convened by UNICEF and other agencies. Nevertheless, continued vigilance is needed to ensure that IDD and iodine nutrition remains on the broad nutrition agenda globally and in individual countries.

## Scalability

GAIN and UNICEF view scalability as the ability of a public health intervention shown to be efficacious on a small scale to be expanded in order to reach a greater proportion of eligible populations, while retaining effectiveness. With this definition, we consider USI to be truly 'at-scale' already (and in fact one of the most impactful public health nutrition interventions). Rather than considering the increase in scale, the Partnership would rather emphasize improvements in program performance, program sustainability, and reach to all vulnerable groups. In this regard, the current project helped identify the most relevant characteristics to maintain and further improve the success of IDD elimination measures globally and revised the key metrics to demonstrate impact of programs on iodine status. To illustrate, the project developed innovative measures to strengthen national policies and other relevant components of the enabling environment, developed viable supply systems for potassium iodate, refined communications approaches to increase demand for adequately iodized salt among key stakeholders, and improved the monitoring of salt iodization programs and iodine nutritional status. The Partnership increased the understanding of the growing importance of processed foods and condiments as a key source of iodized salt (which may protect more vulnerable groups who are not able to access iodized cooking salt). Where knowledge gaps existed, the Partnership commissioned cutting edge research (such as to answer whether USI can, in fact, meet the iodine nutritional needs among infants, toddlers, and pregnant as well as non-pregnant women alike), identified and prioritized steps that need to be taken to answer these questions (such as during the 2015 Technical Working Group on Monitoring held in New York). As a result, GAIN and UNICEF feel well prepared to work closely with the IGN and other partners to push towards the global elimination of IDD by 2020 provided that funding needs can be fulfilled.



## Challenges

Over the course of the Partnership Project, a number of challenges emerged. These began in the first years and led to changes in the overall design and implementation of project activities, at the global, regional and national levels. These issues and potential scope of responses were discussed with the foundation in Annual meetings of the Project Steering Committee, as well as in conference calls between the Partnership Senior Management Team (SMT) and the foundation Project Officers. The list below highlights a few of the key challenges, what the Partnership did to address them and what the areas of future action are to ensure that these are effectively addressed.

*Challenge 1: Fragmented salt industry – while salt iodization has been effective in settings where there is a limited number of large-scale producers, countries with highly fragmented (small scale) salt industry have a more difficult time achieving high coverage of adequately iodized salt*

**What the Partnership did:** Invested in a series of operational studies to explore the viability of models for small-scale salt producers in Ghana and the Philippines, and strengthen the existing models in Senegal. Provided intensive economic analysis of these models and determined that, using a market-based approach, future investments in this sector may not be justified.

**Future actions:** Encourage industry consolidation, as is currently happening in India and Ethiopia through the establishment of central iodization facilities, with better equipment and efficiencies of scale. Feasibility studies need to be undertaken and the implementation of such facilities done in close collaboration with Salt Producer Associations and Government agencies.

*Challenge 2: Inability to sustain achievements has occurred in some in countries due to insufficient political commitment, leading to concerns about USI falling off the public agenda with competing health and nutrition priorities*

**What the Partnership did:** Advocacy with policy makers, including national coalitions and fortification alliances providing evidence on the importance of IDD and the cost-effectiveness of USI. Participated in workshops in China and supported legal challenges in India to promote mandatory USI. Worked with SUN, FFI, HF-TAG and others to promote the integration and harmonization between USI, food fortification and national nutrition planning.

**Further actions:** Continue to advocate for USI in donor networks and the importance of iodine nutrition as part of national nutrition programs. Expand the engagement of the iodine community with other fortification efforts through the Future Fortified Symposium, the Micronutrient Forum and SUN in joint advocacy and programming initiatives. Further integrate iodine coalitions and national fortification alliances.

*Challenge 3: Limited regulatory monitoring leads to poor compliance of salt producers with national standards and a proportion of iodized salt that is distributed with sub-optimal iodine levels*

**What the Partnership did:** Developed training guidelines for regulatory monitoring of USI programs, and implementation of training and adaptation of guidelines to individual country settings and characteristics.

**Further actions:** Better link regulatory monitoring to the existing infrastructure for Food Control Systems (food safety and quality), as well as to other food fortification monitoring needs.

*Challenge 4: Equity - despite the tremendous success in increasing coverage of iodized salt, there are still segments of populations which are not being reached with iodized salt nor protected against iodine deficiency. The focus needs to be on achieving optimal iodine nutrition and recognize the while USI is imperative, it is not necessarily the only strategy.*

**What the Partnership did:** Collaborated closely in several countries to incorporate iodized salt into public distribution systems (e.g. PDS in India), invested in understanding the salt demand amongst different sub-groups of the population (salt type, packaging, etc.), explored the viability of working with small scale producers to adequately iodize salt, invested in addressing knowledge gaps, promoted the use of iodized salt in condiments widely consumed by marginal populations and those unreached with adequately iodized salt (e.g. bouillon cubes in W. Africa).

**Future actions:** Ensuring regulations include salt for the food industry and that regulatory monitoring includes this, encourage the stratification of monitoring data by SES to ensure that all groups are being reached by iodized salt, improve assessment methods to capture food and condiment sources of iodized salt. Explore the complementarity of different interventions to provide optimal iodine nutrition amongst vulnerable groups, such as MNPs for young children and supplements for pregnant women, together with robust optimization modelling for program design.

*Challenge 5: Linking salt reduction and salt iodization – at policy level the synergy is clear, but at implementation level there are still gaps.*

**What the Partnership did:** Advocacy with policy makers and the Salt Reduction community, participated in international meetings and production of publications (with WHO and PAHO) which encouraged integrated planning, implementation and monitoring of both strategies. Included the analysis of both urinary sodium and urinary iodine from the same sample of individuals in two studies, and executed ‘partitioning’ analysis to better understand the sources of sodium and iodine in the diet and provide models on how to use these data to improve both programs.

**Future actions:** Support the development of improved monitoring tools and guidance which will increase joint data collection and analysis. Develop clear protocols on the use of data to inform improved program adjustments, such as modifications in iodine content in salt in response to changes in salt consumption patterns (quantities and sources).

## Lessons Learned

Salt iodization is one of the most successful stories in public health nutrition over the past twenty years. It has helped to reduce the number of iodine deficient countries from 113 to 25 and therefore has had a direct impact by ensuring that millions of children reach their cognitive potential. During this period, clinical manifestations of iodine deficiency have virtually disappeared. Salt iodization remains relevant in the context of changing dietary and salt consumption patterns, although program adjustments need to be made, and performance measurement systems need to generate the data required to modify salt iodine standards. This is perhaps most relevant in settings where there is rapid urbanization as an increasing percentage of dietary salt is consumed in processed foods and not as household discretionary salt. USI is compatible with salt reduction efforts, but it is essential to develop clear, unequivocal messages that reinforce the complementarity of the two strategies.

The currently employed performance measurement systems don’t sufficiently capture the success of salt iodization and iodine programs or consistently generate the data needed to improve programs. However, the key stakeholders involved with global efforts to support national iodine deficiency elimination programs have been able to identify knowledge gaps and how to address them. Improved systems, tools and refined performance measurement and improved linkages to data-informed decision making will not only help countries achieve and sustain optimal iodine status, but will also help identify and reach vulnerable groups which continue to have insufficient iodine intakes and for whom complimentary strategies may be needed. The ultimate goal of national iodine programs is to ensure optimal iodine status amongst all vulnerable groups, in particular women of reproductive age, pregnant women and young children. While the universal iodization of all edible salt should remain the focus of national iodine programs, it is important to acknowledge where this may not be viable, e.g. high industry fragmentation, large number of small-scale salt producers, etc. and to explore additional complimentary interventions as part national efforts to develop an optimal portfolio of interventions based on costs and effective coverage.

Continued investments are needed to monitor iodine nutrition globally, to accelerate programs in those countries which have yet to establish functional and sustainable USI, while also providing oversight in countries which have had success to ensure that there is no backsliding. There is an ongoing need for advocacy, technical support and to assist with the continued integration of iodine elimination into broader nutrition and development programs. As noted above, GAIN and UNICEF are deeply grateful to the Bill & Melinda Gates Foundation for the generous support and ongoing oversight to the USI Partnership Project. The foundation took a risk in bringing together two separate agencies with independent contracts under a single implementation model. The complementarity between GAIN and UNICEF provided the Partnership with a set of proficiencies that neither organization could have delivered independently. This

collaboration translated to improved implementation and overall success of the project and contributed towards the sustainable elimination of iodine deficiency.

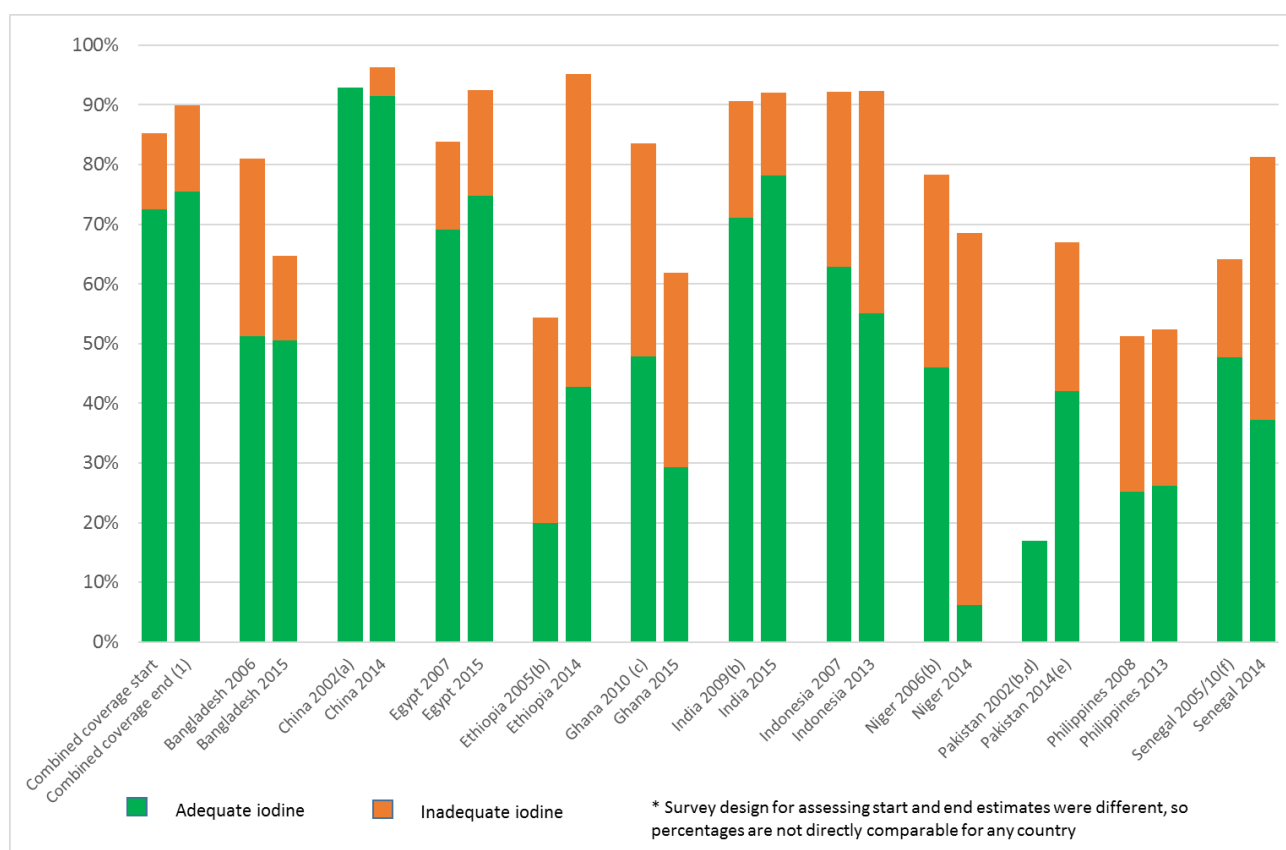
## Project Monitoring and Evaluation

The Partnership was able to characterize changes in the coverage of household iodized salt in eleven countries (Bangladesh, China, Egypt, Ethiopia, Ghana, India, Indonesia, Niger, Pakistan, Philippines and Senegal), while data on the iodine status in the population are available from ten of these countries. The high level results are presented here, and are documented in a series of detailed publications (Annex 1).

### Change in household iodized salt coverage during the Partnership project period (11 countries)

- Increase in household coverage of adequately iodized salt from 72.5% to 75.0% (Figure 1)
- Increase in the reach of adequately iodized salt from 2.27 billion to 2.74 billion people, a change of approximately 466 million people<sup>6</sup>
- Increase in household coverage of salt with any iodine from 85.2% to 89.8% (Figure 1)
- Increase in the reach of salt with any iodine from 2.67 billion to 3.27 billion people, a change of approximately 606 million<sup>7</sup>

Figure 1. Trend in national household coverage with inadequately and adequately iodized salt (total represents salt with any iodine) from start to end of Partnership Project Period<sup>8</sup>



- Coverage for all countries combined using same population figures as at start of the project rather than 2015 population estimates (which gives v similar percentages)
- 2002 estimates for China only reported adequately iodized salt
- Start of project status based on rapid test kit analysis (less reliable for determining adequately iodized salt). All end of project status updates based on quantitative iodine analysis (except Pakistan)
- Ghana 2010 national data are unweighted. Should probably be slightly lower
- 2002 estimates for Pakistan did not differentiate between any and adequate iodine. Assume a proportion is inadequate.
- 2014 estimates for Pakistan based on a MICS surveys in the two most populous provinces Sindh and Punjab (about 70% total population). Adequate and inadequate iodine based on RTK data. Bioanalyt data are available for a sub-set of the survey population however there were methodological issues that mean they are unreliable, however indicative of much lower coverage than by RTK.
- for Senegal the percent coverage with adequately iodized salt at the start is based on titration data from a 2010 survey and on RTK data for inadequately iodized salt from a 2005 survey

### Change in estimated iodized salt production<sup>9</sup> during the Partnership project period (11 countries)

- Increase in the production of adequately iodized salt by approximately 1.7 million MT
- Increase in the production of iodized salt (any iodine) by approximately 2.3 million MT

### Iodine status at the end of the Partnership project period (10 countries)

- Iodine status updates since the start of project are available for ten countries (no data for Niger). For nine of these countries, the median urinary iodine shows adequate iodine status at the national level among at least one population group, either SAC or WRA (Figure 2).
- Data for 6 out of the 7 countries where iodine status is available by sub-national geographical area, indicate adequate iodine status among populations (of SAC or WRA) at all sub-national levels<sup>10</sup>.
- Data in all 8 countries where median urinary iodine data are available by household salt iodine category, indicate optimal iodine nutrition among the population in households using adequately iodized salt. In 4 of these countries, inadequate iodine status was found among populations using salt with inadequately iodized salt (Bangladesh and Senegal) or non-iodized salt (Egypt and the Philippines) salt
- Iodine status among pregnant women (PW) was optimal in 2 (China and Indonesia) out of 6 countries with data for pregnant women (suboptimal iodine status among PW in Egypt, Ghana, India, the Philippines and Senegal)<sup>11</sup>. However, it should be noted that the sample sizes for pregnant women in Ghana, India and Senegal were very low and had limited statistical power

Figure 2. Population and sub-population iodine status at start and end of project period (bearing in mind that survey methodologies were usually different between start and end so not directly comparable estimates)

		Stated Population Group Iodine Sufficient (Y) or Not (N) (determined as population median urinary iodine concentration $\geq 100\mu\text{g/l}$ ) <i>Blank cells = no data available</i>				
		SAC		WRA		
Country	Domain <i>Sub-national areas are generally urban/rural or geographic areas</i>	At project start	At project end	At project start	At project end	Notes
Bangladesh	National	Y	Y*	Y	Y*	*project status at mid point (2011) not end
	All sub-national areas assessed	Y	Y*	Y	Y*	
China	National	Y	Y			
	All sub-national areas assessed	N				
Egypt	National	Y	Y			
	All sub-national areas assessed	Y	Y			
Ethiopia	National	N	Y		N	
	All sub-national areas assessed					
Ghana	National	Y		Y	Y	
	All sub-national areas assessed	N		N	Y	
India	National				Y	
	All sub-national areas assessed				Y	
Indonesia	National	Y	Y		Y	
	All sub-national areas assessed	Y	Y		Y	
Pakistan	National	N	Y*		Y*	*project status at mid point (2011) not end
	All sub-national areas assessed	N	Y*		N*	
Philippines	National	Y	Y		Y	
	All sub-national areas assessed	N				
Senegal	National	Y		N	N	
	All sub-national areas assessed	N		N	N	

*Survey methodologies were usually different between and within countries so outcomes may not be directly comparable estimates*

### **Additional data from end of project assessments**

- Household surveys in all 11 countries were designed to capture the situation at the sub-national level, usually by geographic location, residence type (urban/rural) and by an indicator of wealth/household vulnerability. These sub-national data are essential for future strategic targeting of interventions.
- Most of the Partnership-supported surveys in 2014-15 (5 countries), were designed to:
  - a. Estimate adequately iodized salt coverage among the most vulnerable groups, assessed using the Multi-Dimensional Poverty Index (MPI), in 4 countries.
  - b. Include collection of coverage or consumption estimates for one or more other fortifiable vehicles, such as edible oil, bouillon and subsidized Baladi bread.
  - c. Obtain national estimates of iodine status among pregnant women (sample size small in 3 countries).
- In all eight countries where an indicator of socio-economic status was available (not currently available for China, Ethiopia and Niger), there was a marked difference in coverage of adequately iodized salt between households with highest socio-economic status and those with lowest status. This difference varied from 10 percentage points in India to 23% in Senegal and up to 46% in Sindh province, Pakistan.

### **Key Publications produced by the Partnership**

The Partnership was instrumental in filling critical global knowledge gaps through a series of case studies, surveys and research. A complete list of publications produced by or supported by the Partnership is included in Annex 1.

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- 1 [USI Partnership Steering Committee Reports link](#)
  - 2 [USI Partnership Annual Reports link](#)
  - 3 see ref.35 in Project Documents list
  - 4 see refs.14, 15 and 19 in Project Documents list
  - 5 Pan American Health Organization. Position Document to Improve Public Health by Optimizing Salt and Iodine Intakes. Pan American Health Organization, Washington DC – April 2011
  - 6 Some of this change is associated with the increase in population during the project period. Using the same population as baseline, coverage would be 75.5% and the increase in reach would be approximately 93 million
  - 7 Some of this change is associated with the increase in population during the project period. Using the same population as baseline, coverage would be 89.9% and the increase in reach would be approximately 147 million
  - 8 "Inadequately iodized" = salt with any iodine but not meeting minimum standard, "Adequately iodized" = salt that meets a minimum standard for the iodine content in salt, typically  $\geq 15$  ppm. In most countries, the production/distribution standard is set to achieve 15ppm at HH, and/or they work towards 15-40ppm at HH as in the WHO guidelines for programme managers. The survey reports give data for  $>40$ ppm. For this report,  $\geq 15$ ppm without an upper limit has been adopted for the summary charts to align with SOWC reporting. As such, these estimates do not capture the % of salt which may be iodized at high levels
  - 9 Based on a consumption estimate of 10g salt/person/day against reach figures at the start of the project versus reach with updated population figures for 2015.
  - 10 Continued iodine deficiency appears among the rural population of WRA in Senegal and among the population of SAC and other groups in some provinces in the Philippines. In addition, the median urinary iodine among WRA in some areas of Pakistan (2011) indicates insufficient iodine intake, although the corresponding median for SAC indicates adequacy among this group in all areas assessed.

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<sup>11</sup> To note: optimal status among PW achieved in metropolitan and urban areas of Upper Egypt; small sample size for PW in India, Ghana and Senegal means the estimates are not fully reliable