

A conversation with Dr. Michael Zimmermann and Dr. Jonathan Gorstein on May 1st and 2nd, 2014

Participants

- Dr. Michael Zimmermann – Executive Director, International Council for the Control of Iodine Deficiency Disorders Global Network (ICCIDD)
- Dr. Jonathan Gorstein – Clinical Associate Professor of Global Health, University of Washington; Senior Advisor, International Council for the Control of Iodine Deficiency Disorders Global Network (ICCIDD)
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Note: These notes were compiled by GiveWell and give an overview of the major points made by Dr. Michael Zimmermann and Dr. Jonathan Gorstein.

Summary

GiveWell spoke with Dr. Michael Zimmermann and Dr. Jonathan Gorstein about ICCIDD's role in reducing iodine deficiency and its future plans at the global and national levels, as well as other topics related to salt iodization. Conversation topics included: ICCIDD's global agenda, categorization of countries based on iodine nutrition status, ICCIDD's current budget and funding sources, health problems from excess iodine intake, and a case study of the effectiveness of Thailand's ICCIDD National Coordinator.

ICCIDD's global agenda

Research and guidelines

Without consistent international guidelines, it is difficult to compare levels of micronutrient deficiencies across countries or to measure progress in micronutrient nutrition over time. Vitamin A intake, for example, can be measured through two different biomarkers: serum retinol, or retinol-binding protein (RBP). It is relatively simple and cheap to use RBP as an indicator, but the measurement kits are not standardized, so comparisons across countries or sequential comparisons within a country are not very informative. More importantly, there are not clear guidelines on what constitutes sufficiency or deficiency of vitamin A through RBP measurements. The World Health Organization (WHO) has tried to create serum retinol measurement standards, but serum retinol measurements have not been widely used since they are more challenging to collect than RBP measurements. In addition, there are disagreements within the group of vitamin A experts advising WHO about what the standards for sufficiency should be and how they should be measured.

In contrast, WHO and others see ICCIDD as an authoritative, neutral consensus on iodine nutrition, which has prevented similar problems from occurring with the standards for iodine nutrition. Also, there is a long-standing consensus on the biomarkers that should be used to monitor iodine nutrition in populations. Specifically, input from ICCIDD's network of national and regional coordinators was used to comment on a draft of an update for WHO iodine nutrition standards. ICCIDD was able to contact stakeholders and build consensus around the updated standards, which prevented future implementation conflicts.

However, more work needs to be done for the creation of global standards and methods for assessing the extent of iodized salt used in processed foods.

Alignment and harmonization

Another important role played by ICCIDD is working together with WHO, the US Centers for Disease Control and Prevention (CDC), and implementing agencies (Micronutrient Initiative (MI), UNICEF, and Global Alliance for Improved Nutrition (GAIN)) to ensure that all of these organizations have aligned goals and standards for iodine nutrition programs. At a yearly ICCIDD board meeting, representatives from the implementing agencies come together to discuss emerging issues and potential sources of discord between agencies, governments, and salt producers.

Advocacy and communication

ICCIDD's primary advocacy and communication tool at the global level is the IDD (iodine deficiency disorders) newsletter. The IDD newsletter is sent to twelve thousand email addresses, and six thousand physical copies are distributed.

ICCIDD also functions as a global watchdog and scientific authority for salt iodization programs. In China, iodization programs have recently been criticized by a few doctors, who claim that mandatory salt iodization is not in the entire population's interest. Zupei Chen, the National Coordinator for China, plans to help set up and coordinate an international workshop in collaboration with the Chinese Ministry of Health UNICEF and GAIN in order to address scientific questions brought up by the doctors.

Linking iodine to Scaling Up Nutrition (SUN)

At both the global and national level, ICCIDD has worked to link universal salt iodization (USI) to the SUN movement, an international nutrition program. In Tanzania, the ICCIDD National Coordinator has made iodine nutrition a central part of SUN. ICCIDD spoke with the SUN Secretariat about universal salt iodization, and is now working to go back through their network of regional and national coordinators to get USI integrated into the other SUN nutrition programs at the national level.

Country categorization

ICCIDD has developed a country categorization system based on the countries' progress toward adequate iodine nutrition:

- **Category 1 (Scaled-up):** These countries already have industrial salt iodization, and fairly good iodine status. However, there may be pockets of the population that do not have adequate iodine intake or issues with sustainability of iodization programs. The ICCIDD Global Network should be playing the primary role in improving iodine status in these countries, since implementing agencies (MI, UNICEF, and GAIN) often are not very active.
- **Category 2 (Scaling-up):** "Scaling-up" countries are currently implementing salt iodization projects. Although implementation agencies play the biggest role in countries in this category, ICCIDD can provide some high-level guidance.
- **Category 3 (Fragile states):** These countries have implemented iodine programs in the past, but either through a lack of commitment or lack of enthusiasm, have not been able to maintain USI. These governments sometimes pursue iodine supplementation or other short-term interventions, but it is important for these countries to restore or create USI as soon as possible.
- **Category 4 (no plan for USI):** In a few countries, iodine is not on the government agenda at all. In these countries, ICCIDD can play an advocacy role to generate enthusiasm and government commitment for salt iodization.

Each country is unique, and some fit into multiple categories. The category system is useful because ICCIDD plays a different role in countries in different categories. In category 1 countries, ICCIDD can play an important role without much additional funding. However, extra funding for ICCIDD would allow greater activity in category 3 and 4 countries.

ICCIDD work plans by country

Countries not in current work plans that could be reached with additional funding

- **Afghanistan** is in Chandrakant Pandav's jurisdiction as a regional coordinator (RC), but the country is not in his current work plan. Afghanistan could be considered a category 2 or 3 country, since a small amount of work is being done to address iodine deficiency.
- **Mauritania** is moderately iodine deficient but is not in the regional coordinator Roland Kupka's work plan. It is a category 4 country, since there is no plan for iodization. If Roland Kupka had about \$12,000 in additional resources, Mauritania might be in his work plan.
- **Morocco** had a salt iodization program in the 1990s, but the program is no longer functioning. Morocco is not in Izzeldin Hussein's regional work plan.
- **North Korea** is not currently in the regional coordinator Qian Ming's work plan, but the government has done a national iodine survey, which showed mild iodine deficiency. If Qian Ming had more funding, he could make two to three visits to the country, at a cost of \$8,000-\$12,000.

- **Guatemala** has laws requiring salt iodization, but there is no government enforcement of the laws. Guatemala is not currently in Eduardo Pretell's (RC) work plan. If Eduardo Pretell had more funding, he would visit Guatemalan salt producers with a salt expert from ICCIDD in order to conduct training workshops on titration. A series of visits and workshops would cost about \$15,000.
- **Haiti** is a category 4 country, since it has no infrastructure for salt iodization and no national coordinator. If more funding were available, Eduardo Pretell could go to Haiti and work with MI or GAIN to do a salt situational analysis. Haiti could be a three year project, at a total cost of around \$80,000-\$90,000 if data collection is a part of the project.

Countries in current work plans

- **Niger** imports salt from Algeria. Roland Kupka plans to strengthen the enforcement on importing only iodized salt. It is not clear if Roland Kupka would undertake more actions in Niger next year with more funding.
- **Angola** does not have any salt iodization. In his current regional coordinator work plan, Pieter Jooste will conduct a sub-regional workshop in Johannesburg on iodine program sustainability, and will take a trip to Angola. If Pieter Jooste had more funding (about \$70k-\$90k over three years), he could begin to take steps toward salt iodization in Angola.
- **Russia** has a bill related to salt iodization moving through parliament. The ICCIDD national coordinator, Gregory Gerasimov, is acting as a watchdog to ensure that the bill passes. If he had more funding, he would probably be more proactive by organizing a workshop. Gregory Gerasimov was successful at getting iodine legislation passed in Belarus, and could invite people from Belarus to the workshop to explain why salt iodization is not a violation of personal choice.
- **Madagascar** is in Pieter Jooste's work plan in a limited way, with only a single visit planned. There is currently no data from Madagascar, but \$100,000 from the Gates Foundation Partnership Project is going to be used next year for a national survey. With more funding (about \$8,000), Pieter Jooste could visit more often and identify a potential national coordinator.
- **Mozambique** had a urinary iodine concentration (UIC) survey of women of reproductive age and children two years ago, but Pieter Jooste does not currently have access to the data. He has planned a single visit to Mozambique with a Portuguese-speaking nutrition officer to ask for the results of the survey. Based on the results of the survey, Dr. Jooste wants to create a 3 to 5 year work plan. There has never been a large-scale iodine program in Mozambique, but some infrastructure exists in northern Mozambique. There are two big salt producers in northern Mozambique iodizing salt, but most of it is for export. With more funding (about \$8,000), Dr. Jooste could arrange two more visits to Mozambique.

Other activities contingent on additional funding

Especially for category 1 countries, ICCIDD would like to conduct regional “sustainability workshops” at regular intervals. Eduardo Pretell previously conducted a successful regional sustainability workshop for Latin America, which ideally would be repeated every three years. The purpose of the sustainability workshops would be for multiple representatives from each country to actively examine case studies in salt iodization implementation together and exchange ideas. These regional workshops cost about \$40,000-\$50,000.

For category 3 and 4 countries, the primary usage of extra funding would be funding more visits to the countries from regional coordinators.

Targeted, program-oriented research would also be useful for improving national salt iodization programs.

Issues handled by ICCIDD

Potassium iodate subsidization

Implementing agencies used to partially or fully subsidize the costs of potassium iodate for salt producers. However, subsidization is not a sustainable long-term strategy, since implementing agencies cannot continue to subsidize potassium iodate forever.

MI gets most of its funding from the Canadian International Development Agency (CIDA). CIDA provides much of its foreign aid in the form of commodities, including potassium iodate. For this reason, MI has been subsidizing potassium iodate in Ethiopia, since they had a supply of potassium iodate through CIDA.

In recent years, ICCIDD has been adamant that iodine programs must have cost-recovery measures built in from the beginning. Vietnam lost control of its salt iodization program in part due to its overdependence on subsidies for potassium iodate. Over the course of six months, ICCIDD developed a policy stating that potassium iodate subsidization is not warranted, except in the following circumstances:

- The creation of a “cost-recovery” fund, in which starting costs of procuring potassium iodate are provided, but then the fund is refilled through a tax. Ethiopia’s cost-recovery model is currently fully functional. The initial funding for Ethiopia’s revolving fund was provided through ICCIDD by CIDA and the Japan Fund;
- Salt producers in countries with no salt iodization, like Sudan and Angola, may receive some direct subsidies for potassium iodate, but these countries should be quickly transitioned into a cost-recovery model.

MI wished to continue to offer potassium iodate subsidization in Ethiopia, while other partners felt it was time to stop outside subsidies. This issue was resolved at the national

level through ICCIDD. In Ethiopia in 2012, the person who would later officially become the ICCIDD National Coordinator negotiated to resolve the issue. At the global level, the new WHO indicators for salt iodization programs include guidelines that require subsidies to be phased out within five years.

UIC standards

The Iodine Task Force was able to shift the standard of collecting UIC data from only children to collecting UIC data, when resources permit, from women of reproductive age as well. Agencies now have a consensus that surveying women of reproductive age is important.

ICCIDD has also been able to shift the standard cutoff point for the upper limit of safe urinary iodine concentrations (UIC) to 299 micrograms per liter in school-age children. With earlier guidelines, the concentration of potassium iodate in salt may have been set too low for women of reproductive age to have adequate iodine levels, since program directors may have been alarmed when they saw median UIC in schoolchildren between 200 and 300 micrograms per liter. WHO may soon consider a revision in its standards for adequate UIC as well. ICCIDD hopes that WHO's next edition of the iodine program guidelines will revise "adequate intake" to be a median UIC of 100-299 micrograms per liter, instead of 100-199 micrograms per liter.

UNICEF said that there needed to be a clear guideline, since many programs in countries were having difficulty determining if their potassium iodate concentrations were ideal. The problem was eventually raised to ICCIDD. ICCIDD was able to do research (funded through UNICEF at a cost of \$120k) to show that median UIC levels between 200 and 299 for schoolchildren did not have a detrimental impact on thyroid function for that group.

Although most iodine research is completed through traditional academic routes, Arnold Timmer of UNICEF wanted to use UNICEF funding for this study since it was a question of immediate programmatic importance. A traditional academic method of applying for grants would have likely taken about three years, whereas the study took around one year through ICCIDD. ICCIDD was able to do this study quickly and in a variety of different countries due to its extensive network of national coordinators and program officers who can directly translate research into policy.

Indonesia

UNICEF, GAIN, and MI are all currently working in Indonesia as part of a project funded by the Gates Foundation. There is a broad agreement on the nature of the work, but each implementing agency is working in a different region and using a slightly different method for interacting with the salt industry. MI is working with the smallest producers, GAIN with the largest, and UNICEF with local governments.

Pak Joko, the ICCIDD National Coordinator, works to keep each of the agencies communicating with each other and aware of each other's actions. Gates Foundation

funding for work in Indonesia is set to expire after 2015. ICCIDD is working to ensure that the momentum in salt iodization is sustained.

ICCIDD's budget and funding situation

ICCIDD has previously run on a budget of about \$600,000 per year, but with the loss of AusAid funding two years ago, the current 2014 budget is about \$400,000. It is likely that ICCIDD will get about \$150,000 from UNICEF through a "Project Cooperative Agreement" for 2015, which would be added to the current \$400,000 budget. If received, money from UNICEF through the Project Cooperative Agreement would be expected to be used for activities that are global in scope, so much of it would not be able to supplement regional coordinators' budgets.

Timing

If ICCIDD were to receive a recommendation from GiveWell, it would likely receive the bulk of funds from donors in December 2014 and January 2015. ICCIDD would need to know sometime in October or November of 2014 of GiveWell's decision, so that they could mobilize for implementing the larger budget. In order to implement the larger plan, ICCIDD would likely need about \$2 million in January 2015 and \$2.5 million in January 2016.

Other funding sources

ICCIDD has received some funding from implementing agencies, but these agencies are not committed to continue to provide funding in the future. GAIN and CDC each gave \$50,000 to ICCIDD in 2013 and again in 2014. Micronutrient Initiative gave \$50,000 in 2014.

UNICEF had given about \$30,000 per year to pre-merger ICCIDD, but has committed to giving \$150,000 per year for 2014 and 2015 as mentioned above. UNICEF's level of funding to ICCIDD increased by a factor of ten because it understands the importance of architecture to sustain progress on iodine nutrition, especially since donor enthusiasm for iodine is not constant.

The United Arab Emirates may also provide a grant to ICCIDD for \$500,000, but it is not yet finalized.

There is a possibility that money might be available for specific projects from the Canadian International Development Agency, AusAID, and the Netherlands Development Cooperation.

Bill and Melinda Gates Foundation Partnership Project

The Gates Foundation committed \$40 million dollars over seven years to global nutrition programs, which will end in 2015. It is very unlikely that it will commit more funding to iodine programs until after the Partnership Project is finished and its impact can be assessed.

Broadening the mission

Previously, ICCIDD (before its merger with the Network for Sustained Elimination of Iodine Deficiency) was primarily seen as a technical advisor to WHO on iodine nutrition issues.

The system of regional and national coordinators in the pre-merger ICCIDD was criticized for being too focused on technical nutritional issues and not focused enough on program and implementation issues.

Now, ICCIDD wants to maintain its reputation for global technical expertise on iodine issues while also building up its regional and national coordinator network to play a role as a facilitator and coalition builder. The bulk of ICCIDD's expanded budget will be allocated to regional coordinators so that they can travel more often to category 3 countries.

Iodization equipment and testing

Different techniques are used for iodizing salt, depending on the size of the salt facility and the volume of salt iodized per year. For large-scale and medium-scale facilities, salt on a conveyer belt is sprayed by liquid dosifiers that spray liquid potassium iodate. The salt is then dried and bagged. High-quality, large liquid dosifiers can cost about \$100,000 to \$200,000.

For small facilities, a few different techniques are used. "Dry-mixing" involves mixing salt with potassium iodate powder in a barrel. "Knapsacks" are also used to spray liquid potassium iodate on salt, which can then be mixed with a shovel in order to achieve uniformity.

In addition to having proper equipment, salt facilities should ensure that they follow a standard procedure if the salt is tested and found to have the wrong concentration of potassium iodate.

Excess iodine and hyperthyroidism

Sometimes, salt iodization programs can lead to excess iodine issues in populations, which causes problems with thyroid function. There are a few common causes of excess iodine in populations:

- Potassium iodate standards for salt are set too high;
- The standards are set correctly, but enforcement only punishes producers when the concentration of iodine is too low. Therefore, producers often put too much iodine into salt;

- In northern Somalia and parts of China, aquifers used as water sources have very high levels of iodine in the water (greater than 100 micrograms per liter). People using these water sources often have high UIC without consuming iodized salt.

Excess iodine can cause hyperthyroidism, which is potentially fatal. Arrhythmias, weight loss, fatigue, and cardiac arrest are also possible symptoms. A new Cochrane Review will examine incidence rates of hyperthyroidism before and after salt iodization projects.

Problems with excess iodine are more likely to occur with large abrupt increases in iodine consumption rather than with high chronic levels of iodine intake.

Thailand National Coordinator case study

Thailand can be considered one of the model iodine programs; it has an exceptionally effective national coordinator, Sangsom Sinawat. Sangsom Sinawat was trained as a pediatrician, and used to be the head of nutrition at the Thailand Ministry of Public Health. She has since retired from the MPH, but continues to be the ICCIDD National Coordinator. She joined ICCIDD before 2000.

Sangsom Sinawat's respect for and personal connection to the royal family of Thailand and Princess Maha Chakri Sirindhorn's interest and generosity in nutrition issues has been helpful for implementing iodization projects.

Sangsom Sinawat played a central role in overcoming several obstacles to adequate iodine nutrition in Thailand. Although salt was adequately iodized, UICs were still too low (about 86 micrograms per liter) because table salt was not consumed as often as fish sauce. Traditional fish sauce production involves letting fish ferment on top of beds of salt. If the beds of salt were iodized, then the fish sauce created through this process would also be iodized. However, producers complained that most of the iodine would end up being thrown away using this method and instead wanted to add iodine directly to fish sauce. However, it is not possible to use iodometric titration to measure the amount of iodine in fish sauce as can be done with salt or water, which makes monitoring iodine levels more difficult.

Producers started adding iodine directly to fish sauce about two years ago, and the median UIC in the population now indicates proper levels of iodine intake. The median is now about 220 micrograms per liter in children, almost triple what it was in 2006. Sangsom Sinawat has also convinced the Ministry of Public Health to put a seal on fish sauce products containing iodine.

In 2003 and 2004, Thailand became the first country to systematically monitor the UIC of pregnant women. Sangsom Sinawat also played a central role in developing this program. The government uses a rotating system of measuring one-third of the provinces each year, so that each province has the UIC of pregnant women monitored every three years.

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