

A conversation with Izzeldin Hussein, September 5, 2014

Participants

- Izzeldin Hussein, PhD, MSc, MBA — Regional Coordinator for the Middle East and North Africa, International Council for the Control of Iodine Deficiency Disorders Global Network
- Timothy Telleen-Lawton — Research Analyst, GiveWell

Note: These notes were compiled by GiveWell and give an overview of the major points made by Dr. Izzeldin Hussein.

Summary

GiveWell spoke with Dr. Izzeldin Hussein of the International Council for the Control of Iodine Deficiency Disorders Global Network (ICCIDD) as part of its investigation into ICCIDD's work combatting Iodine Deficiency Disorders (IDD). Conversation topics included:

- ICCIDD's role in iodization interventions
- The impact of IDD in Sudan
- Salt production in Sudan
- Historic and ongoing iodization efforts in Sudan
- IDD-related problems in other countries in the region

Background on IDD, ICCIDD, and Dr. Izzeldin Hussein

Iodine deficiency is a chronic public health issue. Adults need to consume at least 150 micrograms of iodine daily or they begin to suffer from IDD. Because it cannot be solved with a vaccine or other one-time intervention, interventions targeting IDD must be sustained over the long term.

The World Health Assembly (WHA) has a standing resolution calling for progress reports on efforts to eliminate IDD globally. These reports are used to create scores for elimination efforts in countries across the globe and are recorded in a World Health Organization (WHO) database.

Dr. Hussein has an academic background focused on public health and nutrition. In addition to his advocacy efforts on behalf of ICCIDD, he also works in biomedical research.

ICCIDD's role in iodization interventions

ICCIDD relies on a simple program designed to make a clear health impact in countries with IDD problems. Despite many difficulties, it has been successful in its efforts to combat IDD globally.

ICCIDD is uniquely positioned to achieve substantial impacts. It utilizes its expertise and experience in advocacy, technical assistance, and international professional work to assist government agencies, NGOs, local salt industries, and academics with their work to reduce the impact of IDD. Other NGOs often look for technical guidance from ICCIDD.

Dr. Hussein's work for ICCIDD in the Middle East and North Africa has been very successful. Four Gulf Cooperation Council (GCC) countries – Bahrain, the United Arab Emirates, Kuwait and Qatar – that had previously had health problems caused by inadequate access to iodine, and no monitoring or data collection, are now largely free of these problems. These countries have stopped the importation of all non-iodized salt and are now nearly free of IDD. This achievement was mainly due to the technical support extended by ICCIDD in the Middle East region to those countries to eliminate the IDD consequences and establish good monitoring systems.

Collaboration with other groups

ICCIDD works with other global health NGOs including the WHO, United Nations Children's Fund (UNICEF), and the World Food Programme (WFP) in efforts to both promote iodization and reduce overall salt intake globally. ICCIDD possesses unique expertise among global health NGOs that allow it to integrate efforts aimed at both iodization and intake.

ICCIDD is focused solely on reducing the impact of IDD. This makes it uniquely important to the global effort to combat IDD. Other NGOs such as GAIN, MI, and UNICEF that work on IDD run many other health campaigns in addition to their work on IDD. They are often focused on short- to medium-term objectives based on funding opportunities and may not have the long-term presence in a country to sustainably eliminate IDD. However, most of the activities of these organizations are developed in close collaboration with ICCIDD, especially in the Middle East and North Africa region.

Organizations like the WFP may examine the impact of IDD in a country, hold a workshop or other event to raise awareness or address a particular element of the problem, and supply iodized salt in the food basket, but they do not always have a long-term comprehensive approach to USI sustainability. ICCIDD's work is vital because it brings together the other organizations working to combat IDD.

ICCIDD also collaborates with government agencies in Sudan, including the Ministry of Health (MOH) and Ministry of Industry (MOI). These agencies have approached ICCIDD and Dr. Hussein to ask for assistance in their efforts to combat IDD in Sudan.

Many interventions aimed at IDD could not succeed without ICCIDD's assistance. ICCIDD provides many services in support of other organization's iodization efforts including:

- Technical assistance
- Industry and government outreach and communication
- Industry, regulatory, and monitoring training

Despite its unique ability to organize campaigns against IDD, ICCIDD cannot achieve its goals alone and must continue to bring in these other organizations.

Despite its largely positive relationships with other aid organizations, occasionally ICCIDD finds that it is working at cross-purposes with them. In recent years, many of the other aid organizations working in this area have focused exclusively on war-torn regions of Sudan, to the detriment of salt iodization efforts elsewhere in the country.

Dr. Hussein is intimately involved in all of ICCIDD's efforts to collaborate with other aid organizations in Sudan.

IDD in Sudan

It is particularly difficult to reduce the impact of IDD in Sudan for a variety of reasons, including:

- IDD are a severe and widespread problem in Sudan, particularly among young and pregnant women.
- Up to 87% of the population in some locations suffer from goiters.
- In 1999 a study found that 2% of all school children had goiters.
- Every year, there are 250k newborns that are expected to have IDD consequences (such as a learning disability). This is mainly due to the lack of iodine intake by mothers and lack of availability and access to iodized salt for many families.
- Only 1% of households consume iodized salt.
- According to a household survey (HHS) conducted in 2000, only 3,000 metric tons out of a total national supply of 40,000 was iodized.

In recent years, much of the international aid community's focus in Sudan has been on Darfur. This attention has produced results in Darfur, where almost 70% of the population now has adequate access to iodized salt and iodized oil. Most Sudanese, however, continue to have limited access to iodine.

Overview of salt production in Sudan

Sudan produces 95% of the salt consumed domestically from sites along a 56-kilometer stretch of its Red Sea coast. The production of salt forms a cottage industry in the region and is important to the local economy. Unfortunately, the technology used in the Sudanese salt industry is incapable of iodizing all of this salt.

Prior to 1993, the Sudanese salt industry harvested salt and sent it to market with minimal processing and no iodization. It was vital that this situation change because there was not an opportunity to iodize salt and unprocessed salt can contain impurities that are detrimental to human health. In addition to iodization, salt production in Sudan should ideally involve more washing and grinding.

In 1993 an effort to combat IDD in Sudan by UNICEF, the WHO, and ICCIDD introduced two salt processing machines and a small amount of potassium iodate (KIO_3). These machines are not advanced and require manual operation. The power supply is also irregular and occasionally salt producers must rely on backup generators. Small upgrades in the processing technology would substantially improve the quality of the salt on the Sudanese market.

The Sudanese government has expressed a strong interest in salt iodization. Its efforts will continue to fall short as long as the local salt industry is incapable of producing the quantity of iodized salt required for the nutritional needs of the Sudanese population.

Effect on regional salt supply

Improving the quality of the salt produced in Sudan, and iodizing it, will have a substantial benefit for the whole region. Sudan exports salt to its neighbors in North and Central Africa, Chad, and the eastern part of Ethiopia. Whenever the Sudanese salt industry runs out of KIO_3 , economic imperatives force it to produce non-iodized salt and this salt in turn affects the health of the entire region. A small amount of money spent on KIO_3 can therefore have a substantial impact.

ICCIDD's iodization efforts in Sudan

Decision to focus on Sudan

ICCIDD has been working on iodization in Sudan since 1993. Despite a lack of resources and a very difficult period in Sudanese history, it has focused on drawing the attention of policy makers to the benefits of iodized salt.

Recent history of iodization interventions in Sudan

The Sudanese government has sought to combat IDD continuously since 1989. In 1989 the government collaborated with salt producers and UNICEF on an effort to introduce iodized oil capsules. This intervention, which made use of lipidol in gelatin capsules was relatively expensive and had a limited impact.

ICCIDD and Dr. Hussein became involved in Sudan in 1993. At the time, the WHO and UNICEF were attempting to address IDD in the region, but were uncertain how to proceed due to the delicate political situation and lack of infrastructure. ICCIDD

worked with UNICEF to organize a conference on the topic of IDD in Sudan. ICCIDD's involvement since that time has led to progress throughout the region. In the years since, it has collaborated with the WHO, WFP, and UNICEF in several efforts to make iodized salt more available in Sudan.

As ICCIDD's regional coordinator for North Africa and the Middle East, Dr. Hussein has worked with policy makers, technical professionals, the salt industry, and other stakeholders to establish a system that will provide iodized salt to the people of Sudan.

In 1993 there were two major salt producers in Sudan. UNICEF provided the salt industry with two processing units and a quantity of KIO_3 . These machines wash and grind the salt in addition to adding iodine. After the introduction of the two processing units, the quality of the salt produced in Sudan improved.

These two processors are capable of processing 5-10 tons of salt per hour, an amount that corresponds to roughly 3000-4000 tons per year. This falls far short of Sudan's need for iodized salt, which is roughly 100,000 tons per year. The machines are slow and producers did not have enough KIO_3 to sustain this level of iodized salt production.

After a conference that ICCIDD produced with WFP in 1997 provided indications that IDD in Sudan were again being neglected, ICCIDD worked to bring the Sudanese government, relevant NGOs, and the salt industry together to renew the focus on salt iodization.

The Sudanese Health Minister contacted Dr. Hussein in 1997 and asked for his help in crafting a national iodization campaign. Dr. Hussein agreed to a renewed commitment to combat IDD in Sudan if the Health Minister would seek to gain the backing of the cabinet. The resulting MOH decrees mandated iodized salt production but were rarely enforced until 2005, when the MOH secured cabinet support.

A second conference put on by ICCIDD and UNICEF in 2005 brought renewed focus to efforts to combat IDD in Sudan, and Dr. Hussein was again asked by the Sudanese government to provide technical assistance. Dr. Hussein provided technical support to legal advisors to the Sudanese government who crafted legislation mandating salt iodization. He trained government officials and workers in the salt industry on proper iodization technique and quality control. Despite his medical background, Dr. Hussein has experience in the salt industry and understands the process of industrial salt iodization. His experience in the salt industry was gained in Oman when he coordinated the establishment of a salt industry for salt iodization. Dr. Hussein also translated the 2005 salt iodization resolution from Arabic into English.

The 2005 resolution was insufficient because:

- It did not include a ban on non-iodized salt, a provision that was impossible given the low quantity of iodized salt available in Sudan at the time.

- The iodization technology available in Sudan is of poor quality.
- There were no provisions for monitoring production or creating salt-testing labs.
- The salt industry lacks people trained to properly iodize salt.
- Legislation is only effective if it is enforced and the 2005 resolution was not.

The 2005 legislation led to four to five thousand tons of iodized salt production. Of this amount, three thousand tons was purchased by the WFP for distribution in Darfur. The WFP is obligated to include iodized salt in its food aid packages. This resulted in a dearth of iodized salt for markets in the rest of Sudan.

Dr. Hussein was instrumental in the progress achieved in 2005. He met with the Sudanese ministers in attendance at the regional WHO meeting and worked with the Minister of Health to get the support of the rest of the cabinet.

Results of the CIDA grant in 2012

Despite the enormous training effort conducted by ICCIDD in 2005, the effort had a limited impact because the funding for salt iodization is not being maintained. Only a fraction of the planned iodized salt production is occurring. For this reason, Dr. Hussein proposed a new revolving funding mechanism to ensure continuous supplies of KIO_3 . In 2011, UNICEF asked Dr. Hussein if he would be able to engage the Sudanese government on the legislative approach to complement a fresh investment in machinery by UNICEF and KIO_3 by WFP; he said he would.

In 2012, ICCIDD was the recipient of a substantial grant from CIDA, allowing Dr. Hussein to spend much more time and resources in Sudan. ICCIDD reached out to the Sudanese legislature in an effort to buttress the regulations instituted by the Cabinet in 2005. Dr. Hussein's advocacy efforts won the support of 15 important policy makers who shepherded the legislation through the legislature. He spent roughly 10 days in Sudan helping a team crafting the legislation on technical aspects of the law.

The 2012 legislation banned non-iodized salt, provided for a monitoring system, and criminalized the sale of non-iodized salt. This is problematic because there is still an insufficient supply of iodized salt and inadequate industrial infrastructure for its production. Merchants face potential jail terms for the sale of non-iodized salt but it is unclear how they are meant to comply with the law

Additionally, working with UNICEF and the WFP, ICCIDD was able to re-launch the salt iodization program in Sudan in 2012 using the machines donated by UNICEF. This effort has already led to an increase in the production of iodized salt in Sudan.

The combination of new legislation and renewed training, along with new machinery and supplies of KIO_3 , has led to an increase in the percentage of households consuming iodized salt from 1% to 11% in 2012-2013. ICCIDD and Dr.

Hussein brought together the stakeholders and provided technical assistance to the government's and salt industry's efforts to provide iodized salt to the people of Sudan.

Dr. Hussein was also involved in salt survey analysis in Sudan during this period.

Unfortunately, since that time, the funding for KIO₃ and machinery repairs has stopped, and monitoring of the salt producers has not happened. As a result, salt iodization rates may have dropped back to 2010 levels by the end of 2014.

How to make progress against IDD in Sudan permanent

It is necessary to focus on making iodized salt available. At present, the Sudanese salt industry cannot produce enough iodized salt to meet demand. Dr. Hussein is in frequent contact with people in the salt industry in an effort to improve the situation. It is clear that before any more progress can be made, better machinery and a more reliable supply of KIO₃ must be provided.

Dr. Hussein is confident that with adequate funding and training, the impact of IDD in Sudan can be substantially reduced. With a well-designed process and better machinery, capable of producing 5-6 tons of iodized salt per hour, it would be possible to produce 50-55 thousand metric tons of iodized salt per year. This would represent 70-80% of the iodized salt needed in Sudan.

Sudan lacks reliable leadership capacity with the ability to produce iodized salt and monitor that production, so it is necessary to train salt industry and government employees. The current monitoring system is expensive because salt is sent to a lab in South Africa for testing. If there were a lab in a neighboring country, such as Egypt, it would make salt monitoring programs in North African and Middle Eastern countries cheaper.

The 2012 legislation should also be updated. In particular, it is necessary to provide for a better monitoring system and reassess the penalties for the sale of non-iodized salt. Dr. Hussein believes ICCIDD should conduct its own national HHS in Sudan. He does not have confidence in the methodology of the existing survey data. This data is problematic because it consists of self-reported salt consumption information supported with spot checks using rapid test kits (RTKs).

Dr. Hussein has conducted seven national salt iodization surveys in the region. If accurate urinary iodine concentrations were measured instead, the surveys would produce better data and donors could be more likely to support ICCIDD's efforts in Sudan.

Costs of improving and sustaining ICCIDD's iodization efforts in the region

- \$180,000 for three metric tons of KIO_3 , which would meet Sudan's annual need for KIO_3
- \$500,000 each for higher quality salt processing units capable of producing five metric tons of iodized salt each day.
- \$450,000 to upgrade and maintain the machines currently in Sudan.
- \$150,000 to conduct a national survey of the whole population and pregnant women, a particularly vulnerable subset.
- \$130,000 each year for five years to maintain ICCIDD's progress in the region.
- \$125,000 - \$150,000 annually for five years to sustain ICCIDD's efforts in five countries.

IDD in other countries in the region

Sudan is not the only country in North Africa in need of better access to iodine. Morocco in particular has an urgent need for iodization efforts. Providing iodized salt to pregnant and lactating women should be a particular priority.

Morocco had previously been the site of an iodization program, but this has stopped. Restarting this production should be easier than the efforts to promote iodization in Sudan because Morocco has more advanced industrial infrastructure.

All GiveWell conversations are available at <http://www.givewell.org/conversations>