INTERNATIONAL COUNCIL FOR CONTROL
OF IODINE DEFICIENCY DISORDERS

ICCIDD **IDD NEWSLETTER**

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IN THIS ISSUE:

ICCIDD – 25 years old!

The International Council for Control of Iodine Deficiency Disorders (ICCIDD) had its Inaugural Meeting on 22-28 March 1986 in Kathmandu, Nepal. For the past 25 years, ICCIDD has spurred the global IDD control effort. To celebrate, in this issue of the Newsletter several key members look back on the history of the Council and its accomplishments.

Basil S. Hetzel Chair Emeritus, ICCIDD

1986 Inaugural ICCIDD Meeting Kathmandu, Nepal. Left to right: Basil Hetzel, John Dunn, John Stanbury.

The International Council for Control of Iodine Deficiency Disorders (ICCIDD) had its Inaugural Meeting on 22-28 March 1986 in Kathmandu, Nepal. This meeting initiated the active process which led eventually to the Global Program for the Elimination of IDD as a cause of Brain Damage by the year 2000 – a goal listed by the World Summit for Children in 1990. Strong messages of support were received from Dr H. Mahler, Director General of the World Health Organization and from Mr J.P. Grant, Executive Director of UNICEF.

THE INTERNATIONAL COUNCIL FOR CONTROL OF IODINE DEFICIENCY DISORDERS (ICCIDD) is a nonprofit, nongovernmental organization dedicated to sustained optimal iodine nutrition and the elimination of iodine deficiency throughout the world. Its activities have been supported by the international aid programs of Australia, Canada, Netherlands, USA, and also by funds from UNICEF, the World Bank and others.

The founding members of ICCIDD at the Inaugural Meeting in 1986. Left to right, front row: C Thilly, CS Pandav, FP Kavishe, G Medeiros-Neto, E Pretell, J LI, N Chawla, B Hetzel, A Pinchera, OL Ekpechi, J Dunn. Back row: P Greaves, G Maberly, T Ma, V Ramalingaswami, D Lantum, D Haxton, J Stanbury, R Carriere, R Djokomoeljanto, V Mannar.

In his message Dr. Mahler pointed out that *'the ICCIDD can play an important role and WHO looks forward to tapping its considerable technical expertise and experience both in helping countries develop sound prevention and control programs and in conducting needed research leading to advances in the field. WHO is confident that its own efforts can be immeasurably strengthened through close and effective collaboration with groups such as yours'.*

Mr. Grant said: *',As you well know, there are problems for which the solution is a matter of know how and there are problems for which the solution is a matter of will. IDD is a good example of a major nutritional disorder for which the techniques of treatment, control and prevention are easily available and affordable. All it takes is a strong will, wider awareness and cooperation among those who hold a key to the solution of this problem..... The international scientific community has taken a much more active role in responding to its social responsibilities and in energizing governments, communities and institutions, in mounting a major attack against this problem. It is gratifying to be a part of a renewed initiative, which will hopefully break the back of this problem'.*

The Chairman of the Opening Ceremony was Prof. M. Malla representing the Government of Nepal. In his opening address, Dr. Ko Ko (Regional Director WHO/SEARO) noted the massive concentrations of IDD in the SouthEast Asia Region. He had strongly supported the establishment of ICCIDD at the WHO/UNICEF Intercountry Conference a year before, emphasizing that control of IDD was one of the essential targets that had to be achieved if Health for All (HFA) by the Year 2000 was to be attained. He also noted the relevance of the ICCIDD process model and the importance of the multidisciplinary orientation of the ICCIDD.

Mr. David Haxton (UNICEF, Regional Director, South Asia) welcomed the establishment of the ICCIDD and also pointed to the great concentration of IDD in the Region. He welcomed the orientation toward action of ICCIDD, noting the name included the word 'control'. After morning tea, there was a review by Dr. S. Acharya (Nepal) of the severe IDD problem in Nepal. Extensive use had been made of iodized oil injections following the national immunization program, which had led to a reduction of goiter, normal urine iodine concentrations and raised serum thyroxine levels. A series of scientific sessions followed.

Exploratory Meetings

But leading up to this inaugural event in Kathmandu were a series of exploratory meetings during 1985, so that necessary appointments could be made with adoption of a Constitution before the formal inauguration in 1986.

The first meeting was held during the WHO/UNICEF Intercountry Scientific Conference held in Delhi (23-28 February 1985) at the All India Institute of Medical Sciences (AIIMS). The title of the conference was 'Iodine Nutrition, Thyroxine and Brain Development'. A series of scientific papers were presented on various aspects of goiter, cretinism and public health programs. Basil Hetzel took the opportunity of presenting an overview of the IDD problem with special reference to brain damage and the great opportunity for prevention using available technology with iodized salt and/or iodized oil. He also described a social process 'wheel' model for a national program for the prevention and control of IDD. He went on to propose the establishment of a Consultative Group the ICGIDD (later the ICCIDD) to assist national programs, assist research and publish a Newsletter and appropriate books concerned with practical issues in program implementation. These various recommendations were adopted by the International Conference. They were included in an 'Iodine Manifesto' which was published in the first edition of the IDD Newsletter, in August 1985.

The 1985 conference proceeded to appoint an ICCIDD Founding Committee with an Executive and 21 members from developing countries as well as developed countries with an interest in IDD and IDD control. The Executive Committee consisted of: J.B. Stanbury, USA (Chairman); V. Ramalingaswami, India (Vice Chairman); B.S. Hetzel, Australia (Executive Director) J.T. Dunn, USA (Secretary) and Committee Members: G. Medeiros-Neto (Brazil), T. Ma (China) and C. Thilly (Belgium).

Initial funding was provided by UNICEF (US$150,000 per year for 2 years) and by ADAB (Australia) A$17,000 per year for 2 years. It was agreed that a further meeting of the Founding Committee should be held at the time of the 9th International Thyroid Congress (ITC) in Sao Paul, Brazil (1-8 September 1985). At the Sao Paulo Meeting the appointed Board Members met. A Constitution was adopted with a statement on a corpus of expertise with a program model. A series of six Regional Coordinators were appointed (one for each of the WHO Regions) (Table 1).

Table 1: The original six ICCIDD Regional Coordinators

E. Pretell (Peru)	American Region (PAHO)
O.L. Ekpechi (Nigeria)	African Region (AFRO)
C.S. Pandav (India)	South East Asian Region (SEARO)
T. Ma (China)	Western Pacific Region (WPRO)
M. Benmiloud (Algeria)	Middle Eastern Region (EMRO)
F. Delange (Belgium)	European Region (EURO)

At the Kathmandu Meeting in 1986 (participants are shown in the photo on the preceding page), a draft Constitution was adopted and a comprehensive series of scientific papers were presented, with subsequent publication in 1987 of a book (Elsevier) under the title of 'The Prevention and Control of Iodine Deficiency Disorders'. The papers were presented in 5 sections: 1) Overview of Prevention and Control of IDD; 2) The IDD; 3) The Status of Iodine Technology; 4) IDD Control Programs at National Level; 5) Regional Reviews; 6) Implications for the Future. The Inaugural Meeting of the ICCIDD was reported in The Lancet, 17th May 1986.

World Health Assembly Resolution

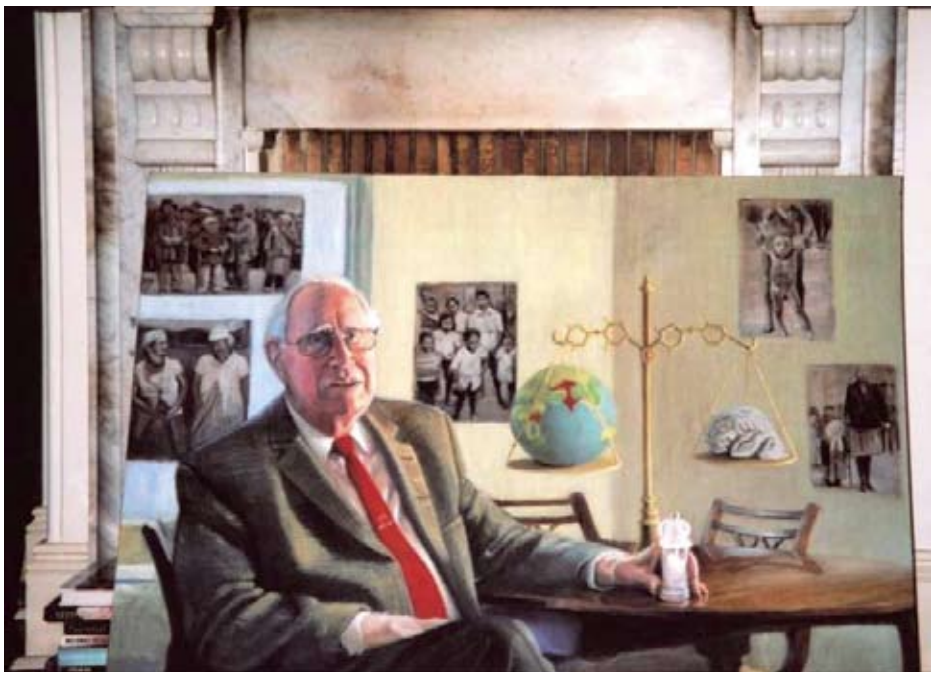
A further major step was taken when the 39th World Health Assembly passed a Resolution calling for the prevention and control of IDD (Geneva, May 1986). The Resolution was sponsored by the Australian Government and supported by 22 other countries. It urged all member states to give high priority to the prevention and control of IDD. It requested the Director General to give all possible support to member states, and to prepare suitable materials for use at a national level for training health and development workers. Also, it called for coordination with other inter-governmental and non-governmental agencies to launch and manage an intensive and extensive international action to combat IDD, including the mobilization of financial and other resources required for such actions. It also asked the Director General to report progress to subsequent World Health Assemblies, including financial aspects. This has been carried out with follow-up Resolutions in 1990, 1996, 1999, 2004, 2007 and 2010.

Conclusion

In conclusion, it can be stated that a global program for the prevention and control of IDD was successfully launched in 1986. Notable progress has been made since in global elimination of brain damage due to iodine deficiency. ICCIDD has played a significant role in this remarkable effort by providing scientific expertise and political support, in collaboration with WHO, MI and UNICEF.

John Stanbury and Basil Hetzel, two of the founding members of ICCIDD, and the 1st and 2nd Chairs of the Council

Dr. John Stanbury of Harvard and Dr. Basil Hetzel of Adelaide, the first and second Chairs of ICCIDD, were distinguished endocrinologists and world renowned scientists who played a pivotal role in identifying and confirming the impact of even mild iodine deficiency on brain development. They played a key role in turning this micronutrient deficiency from being endemic diseases known as goiter and cretinism to a global affliction that robs thousands of millions of children up to 13.5 IQ points. Instead of a health problem affecting mainly people in mountainous areas, iodine deficiency is now recognized as a social and economic issue as well as a factor in human capital formation for national development. Dr. Stanbury received his medical degree from the Harvard Medical School and held academic positions at the Harvard Medical School and the Massachusetts Institute of Technology. Dr. Hetzel coined the term IDD (iodine deficiency disorders). They were recipients of numerous scientific awards. Both of them received the prestigious Prince Mahidol Award for research in public health, which is named after the father of the current Thai king. Dr. Hetzel recently received one of the largest scientific awards, the $200,000 Pollin Prize for Pediatric Research.



This 2010 portrait of Basil Hetzel by Avril Thomas (Adelaide) was painted in connection with the 125th Anniversary of the Adelaide Medical School. The title is ‚The Remedy'. In the background are a series of photos of handicapped subjects suffering from IDD: mental deficiency, dwarfism, paraplegia from China, Indonesia and New Guinea.

The banner of the popular ICCIDD website *(http://www.iccidd.org/)*.

In July 1992, John B. Stanbury, a worldwide recognized authority in the field as well as founder of ICCIDD, was given the Laurea Honoris Causa at the University of Pisa. He gave his lectura magistralis on paradigms in medical science. He was particularly thrilled receiving this honour in the same university where Galileo Galilei (one of his scientific heroes) had made some his revolutionary discoveries. Aldo Pinchera, IDD expert from the University of Pisa, on the right in the lower row, listens carefully to Stanbury's words.

Communication and advocacy: the heart of ICCIDD

Jack C. Ling Chair Emeritus, ICCIDD

Soon after I joined ICCIDD, ICCIDD launched its first website to generate support for the fight against iodine deficiency. The IDD Communication Focal Point website began operation in 1994 at Tulane's School of Public health and Tropical Medicine. For more than a decade the Focal Point promoted the use of communication and education efforts for IDD to programs, sharing information via a series of bulletins about such efforts by various countries and making available material for those requesting them. In cooperation with MI and UNICEF, the Focal Point introduced the international IDD day in 1996 with a communication kit, „A Grain of Salt," that included a comprehensive guide for the observation of the Day and various media material about IDD. Many countries, including India and China, now observe the Day to mobilize support for the continuous effort to end iodine deficiency and to sustain progress. The Focal Point also produced a communication guide for IDD programs, „Eliminating Iodine Deficiencies Now and Forever," which was translated from English into French, Spanish, Russian, Chinese, and Portuguese. The website was later incorporated into ICCIDD's first home site at University of Virginia, which in turn has evolved into the current ICCIDD home site (*http://www.iccidd.org/*).
In 2001, ICCIDD became a founding member of the Iodine Network. The following year, I led the ICCIDD team at the Network's official launch during the UN General Assembly Special Session on Children in New York. ICCIDD has since maintained a lead role in the Network. While ICCIDD is an organization of individuals and the Network is composed of IDD-related international organizations, the functions of the two secretariats are similar.

The 2003 International IDD Conference in Beijing with Jack Ling, 3rd Chair of ICCIDD, serving as Master of Ceremony at the inaugural session as well as coordinator of the four working sessions that produced the Beijing Statement calling for accelerated action on IDD.

During my tenure as Chair, two events stood out as major achievements:

1. The 2003 International IDD Conference in Beijing which brought together two deputy prime ministers (China and Uzbekistan), 21 ministerial-level participants (Afghanistan, Bangladesh, Bhutan, China (3), Ecuador, Guatemala, Kazakhstan, Kyrgyzstan, Laos (2), Mongolia, Nigeria, Philippines, Russia, Tajikistan, Thailand, Turkmenistan, Uzbekistan and several leaders of international development agencies and NGOs including UNICEF, WHO, MI, CIDA, Ausaid, and Kiwanis, to review progress and to examine challenges facing the final goal of sustained IDD elimination. The conference was cosponsored by UNICEF, Chinese Ministry of Health, the Iodine Network and ICCIDD. As ICCIDD Chair, I was the master of ceremony (see photo) and coordinator of the four sessions that produced the Beijing statement. It was the largest gathering of ministers exclusively about iodine deficiencies. UNICEF and WHO have held larger gatherings but on multiple nutrition issues. A number of countries including Vietnam and Philippines were among those that took immediate follow-up action.

2. The adoption of the resolution by the World Health Assembly (WHA) that calls for a review of iodine nutrition status every three years beginning 2007. Various ICCIDD regional coordinators helped mobilize many delegations to support the Canadian draft. Dr. Hans Burgi and Dr. Michael Zimmermann provided valuable support at WHO's Executive Board and Dr. Eduardo Pretell subsequently at the WHA. In fact, Dr. Pretell was able to register as a member of the Peruvian delegation, which allowed him to insert the periodic time requirement of the review from the floor at the very last minute. The first review took place in May 2010. The resolution provides the framework for continuing IDD work on an indefinite basis.

ICCIDD's 2003 annual Board meeting in Chiang Rai, Thailand. Because of the SARS pneumonia scare at that time, at the request of the Thai government, all participants wore masks during the meeting!

ICCIDD, the spark for success in the Americas

Eduardo A. Pretell ICCIDD Regional Coordinator for the Americas

The founding of ICCIDD twenty five years ago represented the successful culmination of many years of scientific work that demonstrated the importance of iodine deficiency. Its creation was meant as a catalyst to influence the governments of countries affected by IDD as well as the international agencies, and to convince them they should assume the responsibility for implementation of preventive programs. In 1960 the World Health Organization (WHO) published the monograph Endemic Goiter, at a time when goiter was considered synonymous with iodine deficiency. This demonstrated the global nature of the problem and that the relationship between iodine deficiency and certain geographic areas was a permanent natural phenomenon. Many countries started to implement iodized salt programs aimed mainly at curing goiter. Unfortunately, with very few exceptions, only few countries were even temporarily successful.

In 1974, even before the deleterious effect of iodine deficiency during pregnancy was widely recognized, a group of scientists who were strongly committed to the fight against IDD highlighted the importance of iodine deficiency as a health problem, and called for its urgent prevention (1). By the mid-1980s, just before the launch of ICCIDD, a broadened knowledge on the many aspects of iodine deficiency and the feasibility of its elimination was fermenting and crying for action. John Stanbury, the founding Chair of ICCIDD, wrote *"ICCIDD has been created in response to the new perception of the enormity of damage done by lack of iodine in the developing countries, and to the notable lack of progress in applying control measures in so many regions with glaring needs"*.

In the early 20th century, iodine deficiency was recognized as a public health problem in most of the Latin American countries. The Andean Regions and Central Mexico were the most affected, but many other parts of the hemisphere were also severely involved, and virtually no country in mainland Latin America was free of iodine deficiency.

In the 1950s to 1970s, most countries passed legislation on iodized salt, establishing arbitrarily a wide range of iodization levels, likely because of poor information on the daily physiologic needs of iodine. Unfortunately, after some initial success in most of the countries, many of them relapsed, mainly because several common problems emerged. First, laws were not enforced; second, monitoring was either absent or inadequate, thus, after initial enthusiasm on the part of the government and the salt industry for regular checks on iodine levels in salt, interest waned, monitoring lapsed, and the salt was uniodized or its iodine content greatly diminished; and third, the importance of iodine deficiency and its correction was not adequately communicated. Hence, about thirty years later, only a few countries were nearing iodine sufficiency, and goiter prevalence had not significantly changed. In 1999, the WHO reported that despite significant regional progress, iodine deficiency remained a public health problem in 19 countries in the region.

The Ten-Year Health Plan for the Americas, approved by all the governments of the Western Hemisphere in 1972, called for reduction of endemic goiter to a prevalence level of less than 10% within ten years. However, despite frequent pledges by governments, health authorities, and international agencies, the problem remained unsolved. In the early 1960's, the Pan-American Health Organization (PAHO)/WHO gave high priority to the study of this problem and founded the Technical Group on Endemic Goiter, convening prestigious Latin American scientists under the leadership of John Stanbury. This group contributed significantly to broaden the understanding and importance of the consequences of iodine deficiency in almost all the countries in the region. A number of congresses and publications focused attention on the health consequences of endemic goiter, cretinism, and iodine deficiency. The first three meetings of this Technical Group (Caracas, Venezuela 1963, Cuernavaca, Mexico 1965, and Puebla, Mexico

Eduardo Pretell, ICCIDD Regional Coordinator for the Americas

1968), focused on the pathophysiology of endemic goiter and the effects of iodized oil injections. The fourth meeting, in Guaruja, Brazil (1973), reviewed new knowledge of pathophysiology, emphasized the importance of cretinism and other complications, and surveyed prophylaxis in Latin America. This meeting resulted in a series of recommendations on definitions, research, and approaches to prophylaxis.

The 5th and last meeting of this series was in 1983. It became a major landmark in the control of IDD in the world. It took place in Lima, Peru, and preceded the creation of ICCIDD two years later. The objectives of this meeting were to review recent advances in the understanding of the pathogenesis of endemic goiter, cretinism and iodine deficiency, to assess available methods for their diagnosis, treatment, and prevention, to document the current status of iodine deficiency by geographical area, and to make concrete recommendations for future approaches to the problem (2). The proceedings of this meeting represented at that time the input of the largest and most representative technical group on endemic goiter and cretinism ever assembled. The new concept of the 'Iodine Deficiency Disorders' of Basil Hetzel was presented at the meeting.

Thus, the Latin American contribution to the birth of the global IDD control effort included pioneering studies of the effects of iodine deficiency on the quality of life (particularly the risk of brain damage due to iodine deficiency during pregnancy), investigations of new methods for its prevention, such as the use of iodized oil, and the importance of urinary iodine analysis as the most important indicator for diagnosis and monitoring of iodine deficiency. Despite this, the problem continued to loom large, mainly because there was a failure to translate knowledge into action. Thus, by the early 80s, only three Latin American countries, Peru, Bolivia, and Ecuador, were in the process of re-implementing scientific and technical programs to tackle the problem.

There is no doubt that the creation of ICCIDD turned out to be the major catalyst to change in Latin America, as in the rest of the world. Since the foundation of ICCIDD in 1985, most Latin American countries have reassessed their iodine status and implemented programs for the control of IDD. Great progress has been made, particularly by the aggressive push for iodized salt programs. Currently all the countries in the region have reinforced their activities to reach the goal of universal salt iodization (USI). With the exception of only three countries (Haiti, Dominican Republic and Guatemala), the production and/or importation of iodized salt can cover the potential human demand. Recent data from WHO clearly demonstrates the remarkable success of these efforts in the region: currently >90% of households are consuming iodized salt and 16 out of 23 larger countries have a median urinary iodine that is sufficient (>100 µg/L). The American continents, within the global context, have made the most progress towards achieving the goals of ICCIDD. The enormous achievements to date suggest the American Region will be one of the first regions to attain the goal of the sustained elimination of iodine deficiency.

The contribution of ICCIDD toward these goals is widely recognized in the region. Its presence has been a key to overcome the many difficulties faced by countries in their efforts. ICCIDD has contributed to the development, assessment, quality assurance and sustainability of country programs. The most important contribution of the ICCIDD Regional Coordinator and the National ICCIDD Focal Points has been their endless advocacy and journeys of technical support in all the Latin American countries. Moreover, it has been successful in obtaining the strong support of important academic and medical bodies, such as the Latin American Thyroid Society and the Pan-American Federation of Endocrine Societies, to provide advocacy and technical support to the national programs.

It should be emphasized, however, that despite the great progress made by governments and agencies in the past 20 years, some problems remain. These include a low level of governmental support and lack of effective monitoring of salt iodization in some countries that is preventing the effective and sustained elimination of IDD in the whole region. What is now needed in most of the countries in the Americas is collaboration with national authorities to assure: a) sustained and visible political commitment; (b) sustained national oversight of the quality of iodized salt and the processes for optimal iodine nutrition; (c) sustained scientific monitoring and public reporting of progress; and (d) sustained access to knowledge of the value of iodine in the diet and the great dangers of its absence.

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John Dunn and the IDD Newsletter

The photo shows a 1995 meeting at UNICEF House where UNICEF Executive Director James Grant (center) tests the iodine content of salt, accompanied by (left-to-right) Alan Court (UNICEF Bolivia), Arthur Swanberg (president of Kiwanis International), Antonia Novello (UNICEF), John Dunn (ICCIDD Secretary), and Rolf Carriere (UNICEF Bangladesh).

John T. Dunn (1932-2004) was a participant in the inauguration of the ICCIDD in Kathmandu in 1985. John was a pioneering thyroidologist and developed now widely-used methods for measurement of iodine in urine and salt. He was ICCIDD secretary for 15 years, guided its evolution, and became its executive director in 2001. He developed the IDD Newsletter that began as a two page reminder and over the past 25 years evolved into a quarterly publication now frequently quoted in the medical and epidemiological literature.

The evolution of the IDD Newsletter, from 1986 to 2011.

François Delange and the ThyroMobil project

François Delange (1935-2007), Professor of Pediatrics at the University Hospital Saint Pierre in Brussels, Belgium, had a life-long interest in IDD. He did seminal fieldwork between 1965 and 1982 in former Zaire on the etiology of the myxedematous form of endemic cretinism.

François Delange, 2005

François was a member of the ICCIDD board since its foundation in 1986 and acted as the regional coordinator of ICCIDD for Europe between 1986 and 2001. He was the promoter of the ThyroMobil initiative sponsored by Merck KGaA. The company purchased a van (see photo) with an ultrasound scanner and a freezer to store urine samples, with the original objective to investigate the prevalence of IDD and goiter in Europe. It was followed by similar studies in Latin America, Africa, Indonesia and Australia. Altogether, 32 countries and 432 sites were investigated, including more than 38,000 school-age children. François was Executive Director of ICCIDD between 1995 and 2001. After the retirement of John Stanbury and Basil Hetzel, François was, with John Dunn, the scientific conscience of ICCIDD.

Francois DeLange, a great authority on ICCIDD, travelled from Brussells to Krakow to receive the Laurea Honoris Causa from the Jagiellonian University in 2000.

Thyromobil, 2002 Zürich

Cretins and clues in Renaissance painting: historical evidence of severe IDD in Tuscany

Aldo Pinchera ICCIDD Regional Coordinator for West Central Europe

In January 1994, the late John T. Dunn, long time editor of the IDD Newsletter and executive director of ICCIDD, visited Italy to promote legislative measures for iodine prophylaxis. We made a goiter survey in Borgo San Sepolcro, an area of southern Tuscany which had been severely iodine deficient in the past. It was not a surprise to find a myxedematous cretin and a neurologic cretin (photos) who were more than 40 years old. As expected, no cases of younger cretins were found since iodine deficiency had been largely, although not completely, corrected. It is of interest that Borgo San Sepolcro is the village in which Piero Della Francesca, one of the most gifted painters of the Italian Renaissance, was living and working. No wonder that looking carefully at his painting "La Resurrezione" (Figure 1A) one can easily identify a thyroid nodule in his self portrait (Figure 1B) and a goiter accompanying an enlarged belly (Figure 2) in his famous "La Madonna del Parto". This is an historical documentation of the well established relation between iodine deficiency and pregnancy. Piero Della Francesca stopped painting at a relatively young age because of a tremor in his hands: in retrospect, could we speculate that he had a toxic thyroid adenoma?

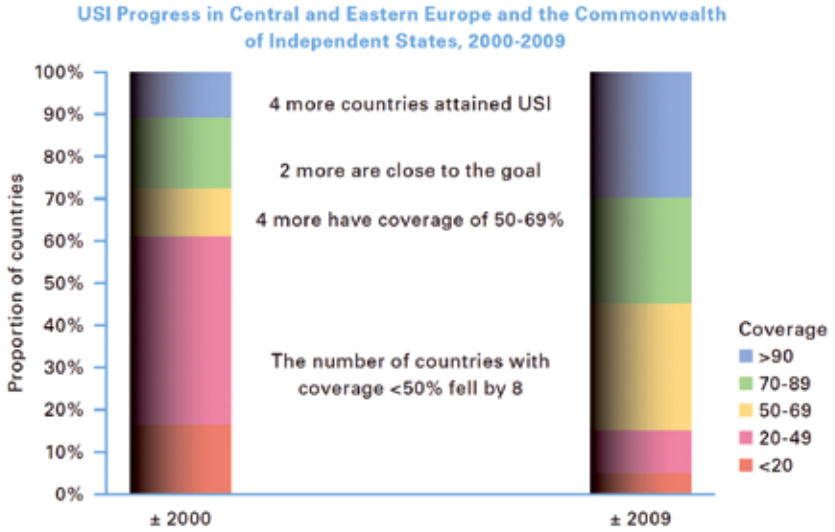
Figure 1A

Figure 1B

Figure 2

Major achievements in salt iodization in CEE CIS during the decade 2000-2009

A new Unicef report launched in Belgrade, Serbia, on 2 March 2011 describes how mandatory salt iodization in the production of salt for households, bakeries and other key food industries have led to vast progress in controlling iodine deficiency. The regional study of 20 countries, entitled 'Universal Salt Iodization in Central and Eastern Europe and the Commonwealth of Independent States' (CEE CIS) during 2000-2009, provides compelling evidence from countries which have enacted legislation of the iodine supplies through the highly influential salt chains for food manufacturers, public catering and households.



"Engaging governments, salt suppliers and food manufacturing industries are crucial as the experience in Serbia has proven. We encourage as many countries as possible to follow this strategy," said the Assistant Minister of the Ministry of Health of Serbia Dr. Svetlana Mijatovic at the forum`s opening. Dr. Mijatovic emphasized Serbia`s commitment to promote sustainability of universal salt iodization by approving legislation that will fully harmonize Serbia with international standards in salt iodization and by allocating a budget for impact monitoring. Annually, an estimated 2.6 million babies or 46 per cent of 5.6 million babies in the region are born in households not using adequately iodized salt and therefore are unprotected from iodine deficiency disorders. It is difficult to gather data for under-two-year-olds and most surveys track urinary iodine in school children and pregnant women. If a mother is deficient, it is certain that her baby will be born deficient. Up to 80 per cent of the total salt intake in this mostly industrialized region is consumed through processed foods such as bread, meat, cheese and dairy products, according to the report by UNICEF and stakeholders in Central, East Europe and the Commonwealth of Independent Nations.

Among the countries in the study, only Russia and Ukraine have yet to benefit from an adoption of this most feasible, least costly and most effective way to reach all children. Once this practice would be adopted in the two countries which have the largest populations in the region, it would potentially raise the daily consumption of adequately iodized salt in the region to up to 98 per cent on average from the current 51 per cent. The major objection in Russia and Ukraine commonly cited is the insistence on freedom of choice of iodized versus common household salt in the retail outlets, noted the report.

Bread in Serbia, as in Russia and Ukraine, is an important staple food with widespread daily consumption. The experience of several West European countries, Belarus, Kazakhstan, and elsewhere in the region has proved that switching the salt in bread baking to the iodized one does not require any major change in existing technology or personnel investments. The use of iodized salt does not substantially increase the price of bread, according to the report.

UNICEF Goodwill Ambassador Anatoly Karpov at the forum said, "When the decade-long experience of salt iodization in the majority of countries in our region shows how to reach success, it does not seem smart to continue inventing alternatives."

"In countries where bread and other processed foods containing salt contribute significantly to the population's diet, replacement of the non-iodized salt with iodized salt by the food industries is an important contribution to ensure adequate iodine levels," said Lorenzo Locatelli-Rossi, GAIN Salt Iodization Manager.

When in 1994 UNICEF and WHO reached agreement to recommend Universal Salt Iodization (USI) as the preferred strategy for eliminating Iodine Deficiency Disorders (IDD), the countries in Central and Eastern Europe and The Commonwealth of Independent States were undergoing or entering a period of political turmoil and economic transition. After President Tito's death, the Federal Republic of Yugoslavia had started to fall apart, a process that lasted into 2006 with the peaceful separation of Serbia and Montenegro. And after the Union of Soviet Socialist Republics (USSR) split up in 1991, the newly independent states began a transition toward autonomous, market-based decisions. UNICEF established country offices throughout the region during the 1990s and started increasing its support for the national efforts to reach for USI.

Global tracking data maintained by UNICEF show that in 2000, adequately iodized salt was used in 50% or more of the households in only seven countries in this study. This had increased to 85% by 2009 – a quantum leap compared to a decade ago (see Figure). Obviously, more needs to be done to close the remaining margins. Nevertheless, the key important lesson learned from a decade of action is that despite the unique socio-cultural environment and the significant political and economic transitions that lasted into the decade, the USI strategy was readily adopted, pursued and carried forward in most countries of the region. The findings of this study support the evidence that the public health problem of iodine deficiency can be effectively overcome by USI, and they add to the growing global confidence that IDD can be eliminated by establishing salt iodization as the universal norm.

Direct digital entry of national iodine survey data in Senegal

Ismael Ngnié Teta, Kendra Siekmans, Banda Ndiaye and **Peter Berti** University Cheikh Anta Diop, Dakar, Senegal;
The Micronutrient Initiative and HealthBridge, Ottawa, Canada

IDD is a public health problem in Senegal, with four regions considered endemic for goiter. About 60% of households do not use adequately iodized salt and over 75% of children are iodine deficient (1). A national program to promote Universal Salt Iodization (USI) started in 1995 and seeks to reach the goal of 90% of households consuming iodized salt. To evaluate the progress achieved to date, the Government of Senegal commissioned a national survey in 2009, in collaboration with University Cheikh Anta Diop and the Micronutrient Initiative (MI). The survey was designed to assess the current national prevalence of iodine deficiency in school-age children and women of reproductive age, levels of iodized salt utilization and associated household characteristics.

Building capacity for USI program monitoring and evaluation includes using appropriate technology for improved data management. Personal digital assistants (PDAs) are hand-held computers that facilitate high quality data collection and timely analysis for large complex surveys. Experience with using PDAs for direct data capture is increasing in the global health field (2-4). A recent review of the evidence concluded: "Evaluations of personal digital assistants and mobile devices convincingly demonstrate that such devices can be very effective in improving data collection time and quality" (5).

In addition to ensuring high data quality, direct data capture eliminates the step of data entry of paper-based questionnaires and data are available for analysis within a very short time following completion of the survey. Concerns

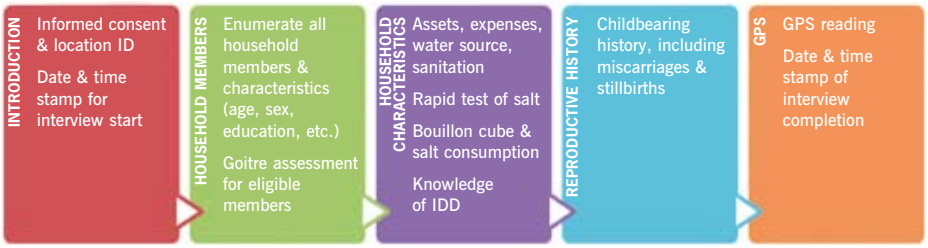


Figure 1: ***Survey modules and description of data collected in each module***

with this method include the lack of a hard copy for data verification or double entry, the perceived complexity of programming the questionnaire and the cost of the equipment and technical support for using it. This paper describes recent experience in Senegal using PDAs to collect data for a national USI program evaluation.

Figure 2: ***PDA equipment used for data collection***

Survey design

Although previous studies of IDD have been conducted in goiter endemic regions of Senegal, this survey was designed to assess the situation in a nationally representative sample taken from all regions of the country. The survey questionnaire was developed by Institut de Population, Développement et Santé de la Reproduction of University Cheikh Anta Diop (IPDSR) and MI as a paper-format questionnaire in French and was then adapted for direct data capture on PDAs. The questionnaire consisted of several modules that were administered to each household (Figure 1). In addition to these questions, enumerators also examined all school-age children and women of reproductive age present in the household for goiter and used a rapid test kit to test household cooking salt for iodine content. In sub-sampled households, samples of salt and urine were collected for laboratory analysis. Technical support on the use of PDAs for data collection, management and analysis was provided by HealthBridge (Ottawa, Canada), along with the equipment (Figure 2) for carrying out the survey. Panel 1 provides an overview of the specific data quality control features that were programmed in the PDA-based questionnaires.

Survey Training

District health team members were appointed by the Ministry of Health to be enumerators within their respective districts, with five senior team members chosen as supervisors. Survey training was done in two stages. An initial three-day training session was held for the survey coordination team and supervisors. The training covered all key aspects of the survey, including operation of the PDA, interviewing techniques, clinical assessment of goiter, collection of salt and urine samples, practice sessions and field testing. Team supervisors received specific training in PDA maintenance, battery charging, troubleshooting and data backup. A second round of training was conducted for enumerators, with one day spent on introducing the teams to the PDAs and providing training in their operation, while also reviewing the questionnaire. A second day was spent on training in clinical assessment of goiter, collection of salt and urine samples, practice sessions and field testing.

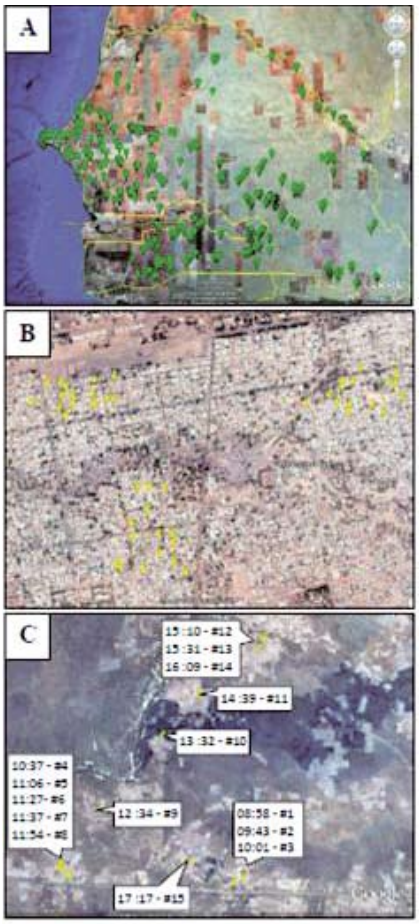


Figure 3: ***Maps of surveyed households using GPS coordinates***

Panel 1: Summary of PDA-specific data quality control aspects

- If the respondent refused to participate, the survey ended
- Response-dependent skips:
  - If child < 13 years, skip "Occupation" question
  - If no salt in household, skip type of salt questions
- Checks
  - If no response entered, prompt enumerator to enter response (not allowed to go to next question before answering current question)
  - If select both "don't know" and "consume iodized salt" as ways to prevent iodine deficiency, prompt enumerator to clarify response
- Prompts
  - If child or woman of eligible age group, prompt enumerator to perform goiter assessment and enter results of assessment
  - Random selection of child & woman to provide urine sample

Survey Implementation

From October 15 to November 5, 2009, five teams used 25 PDAs to collect data from 3768 households across 13 regions. On the final day of the survey, data were downloaded from PDAs via USB cable to a Microsoft Access database on a laptop computer. Refusals and incomplete interviews were identified. Preliminary results were available within one week of the survey end. Laboratory results (urine and salt iodine concentration) were available within two months post-survey and merged with household and member databases (98% urine and 96% salt results successfully matched). A total of 15 households refused to participate in the survey but there was no indication that this was related to PDA use. Enumerators reported some anecdotal concerns expressed by caregivers about the PDAs, such as respondents wondering if the PDA was equipped with a camera (they were not). The average interview length was 19 minutes (median 16) and this varied based on the household size (number of members). PDA units were equipped to take GPS readings and this was successfully done for 82% of households surveyed. This information was useful in providing a visual overview of the distribution of households across the country (Figure 3A), in specific clusters (Figure 3B) and for each enumerator's daily data collection record (Figure 3C).

Lessons Learned

The following lessons learned were identified by participating stakeholders:

1. Health staff quickly learned to use PDAs for survey data collection.
2. Inability to look back at previously-entered data was challenging for enumerators but interview technique training helped and the PDA was programmed to provide confirmation at strategic points.
3. PDA programming contributed to high quality data – there were no inconsistencies between responses (e.g., no "pregnant men"); no missing data; appropriate target group selection; non-biased random selection of woman/child for urine samples.
4. Preliminary results were ready and presented to survey team within one week after completion of the survey because of time-saving on data entry and cleaning.
5. Conceptual differences in survey questionnaire design need to be understood.
6. Not all problems solved – still experienced some standard survey problems, including household selection and identification errors, variability in enumerator performance.
7. Small errors in programming affected data collected by all enumerators – this reinforced the importance of a well-tested questionnaire with no last-minute changes.
8. While costs for printing questionnaires and manual data entry were saved, significant costs were incurred for PDAs technical support by an international consultant.

Conclusion

PDAs are an excellent tool for enhancing capacity to collect complex household survey data and make it available for analysis in a timely manner. Quality training and adequate pretesting of questionnaires are still essential. Increased use of mobile or hand-held computers in USI program monitoring and evaluation is recommended, along with efforts to build local technical capacity.

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Dietary iodine: why are many pregnant women in the U.S. not getting enough?

The following paragraphs are excerpted from: R. Renner. Dietary iodine: why are so many mothers not getting enough? Environmental Health Perspectives 2010;18(10):A439-442

Maternal iodine deficiency has been associated with a number of adverse effects on the infant brain resulting in a continuum of effects depending on the degree of iodine deficiency, from lowered IQ to severe mental retardation. The thyroid gland uses iodine to make thyroid hormones, which in turn direct brain development. Insufficient iodine is considered the leading cause of preventable mental retardation in the world, and iodine deficiency in pregnant women has been estimated to result in the loss of some 10–15 IQ points at the global population level.

When families prepared (more) meals at home, they used iodized salt. As they evolve toward diets filled with foods prepared out of the home, those foods do not use iodized salt, and the iodine levels subside.

Richard Hanneman *Salt Institute*

Data collected over the last 30 years through the National Health and Nutrition Examination Survey (NHANES) suggest iodine levels in the U.S. population, particularly among women of childbearing age, may be getting too low, according to epidemiologist Kevin Sullivan of Emory University. The good news is that, in the past, concerted efforts to ensure adequate iodine intake have yielded beneficial effects. The task now is to understand why so many women are deficient in iodine – and what it will take to make sure pregnant women get enough.

Median urinary iodine among the general U.S. population plummeted by almost 50% between NHANES I (1971–1974) and NHANES III (1988–1994), and the percentage of women with median urinary iodine values below 50 µg/L (indicating moderate or severe deficiency) jumped from 1% to 7%. In a more recent analysis incorporating data from NHANES 2005–2006, Sullivan and colleagues found certain groups of U.S. women were at increased risk for iodine deficiency. These included nonpregnant, nonlactating women aged 40–44 and various groups of pregnant women (women aged 15–19 years, women aged 30–39 years, women in the non-Hispanic white and other racial/ethnic group, and those who did not consume dairy products, which are one of the chief dietary sources of iodine). The authors concluded that iodine nutrition among U.S. women of reproductive age has stablized since NHANES III (1988–1994) but that the iodine status of pregnant women overall hovers just above the cutoff for iodine sufficiency.

Experts in this field agree one important change leading to this decline is the increasing trend of eating out and the growing reliance on processed foods. Very often, restaurants and fast food outlets use noniodized salt, according to Richard Hanneman, president emeritus of the Salt Institute, a manufacturers' group. And virtually no U.S. processed foods are made using iodized salt. "When families prepared [more] meals at home, they used iodized salt," Hanneman says. "As they evolve toward diets filled with foods prepared out of the home, those foods do not use iodized salt, and the iodine levels subside."

Salt producers decide whether to iodize salt on the basis of customer specifications, says Hannemann. And there are many misconceptions about the use of iodized salt in food industries, according to Arnold Timmer, a nutrition project officer for the United Nations Children's Fund (UNICEF). "Some producers think it changes the taste or color of the food, and they do not want to take the risk," he said in a 2006 UNICEF news article. "However," he continued, "many food producers have been using iodized salt for a very long time without any problem." A 1995 study corroborated that iodized salt used in typical amounts does not affect the taste or color of foods.

Hanneman says the Salt Institute has just begun an initiative to encourage U.S. food service companies to use iodized salt and to educate food manufacturers about the future need for them to incorporate iodized salt into their products.

In 2007, Boston University School of Medicine associate professor Elizabeth Pearce described other national trends in food production that have changed the amount of iodine we take in. The amount of iodine in milk declined between the 1970s and 1990s as a result of limits placed on the addition of organic iodine ethylenediamine in cattle feed and disinfectant washes that contain iodine (which is absorbed through the skin and incorporated in cows' milk). Other changes occurred in commercially baked breads, which once widely used iodate-based bread conditioners to maintain freshness. In 1965 bread contained as much as 150 μg iodine per slice. In 2002, the average iodine content of 17 brands of bread from Boston-area supermarkets was 10 μg per slice, although three varieties of bread contained greater than 300 μg per slice.

Of the fast food outlets Burger King, McDonalds, Taco Bell and Wendy's, only Burger King said it used iodized salt when researchers from Boston University Medical Center asked. But when the researchers compared the iodine content of food items from Burger King and McDonalds to assess the impact of iodized salt in food preparation, the iodine content appeared similar between comparable items from each restaurant. Aside from its fish sandwiches, milkshakes, and the bread in its chicken sandwich, Burger King's food contained very little measurable iodine.

Prenatal vitamins offer another promising but sometimes disappointing source of iodine. The Institute of Medicine suggests 220 μg iodine intake daily during pregnancy and 290 μg while breastfeeding. To reach this goal, the American Thyroid Association (ATA) in 2006 recommended that women take prenatal vitamins containing 150 μg iodine daily during pregnancy and lactation to supplement iodine intake from the diet. But a brief study of the iodine concentrations in 223 prenatal vitamins marketed in the United States found that 49% contained no iodine at all. Among those that did contain iodine, most claimed to contain the recommended 150 μg or more per daily dose. However, the measured iodine concentration in these vitamins varied by plus or minus 50% from the potency listed on the label.

Salt intake should be 5 grams a day or less, but all salt consumed should be iodized.

Michael Zimmermann *Swiss Federal Institute of Technology Zürich*

Americans average a daily intake of more than 3,400 mg of sodium, equivalent to 8.5 g (1.5 teaspoons) salt, most of which comes from processed food. This substantially exceeds the existing maximum intake level of 2,300 mg sodium, or 5.8 g salt (about 1 teaspoon), established by the 2005 Dietary Guidelines for Americans. In spring 2010 a committee of the Institute of Medicine issued recommendations for ways to reduce U.S. sodium intake, with modifications to standards for sodium content of processed foods listed as a primary strategy. The goal of reducing salt intake and universal salt iodization are entirely compatible, says Zimmermann. He coordinated a 2007 meeting sponsored by the WHO to discuss the joint goals of reducing hypertension and reducing iodine deficiencies. Participants at the meeting concluded that promoting iodized salt does not conflict with recommending reduced salt intake. "Salt intake should be five grams a day or less, but all salt consumed should be iodized," says Professor Michael Zimmermann of the ETH Zurich, Switzerland. Sullivan and Pearce agree. "There is a need in the United States to reduce overall salt intake. It would seem prudent to recommend that most people reduce their salt intake, and of the salt they do consume, it should be iodized," Sullivan says.

But, pragmatically, Pearce says that requiring universal salt iodization in this country is very unlikely to happen. "An effort to mandate salt iodization in the United States back in the 1940s was met with significant opposition," she notes. In the absence of such a large-scale public health intervention, Pearce thinks the ATA's approach for prenatal vitamins is the correct way to approach the problem of insufficient iodine in pregnancy. "The problems have been that too few people know of the ATA recommendations, and consumers may have difficulty in finding iodine-containing prenatal multivitamins," she says. The ATA is working with various obstetric and other societies at present to try to expand knowledge about the current recommendations.

A new age of global health governance?

The following paragraphs, relevant to the current and future global IDD control effort, are excerpted from: T Pang et al. "The new age of global health governance holds promise" Nature Medicine 2010; 16(11): 1181.

The recognition that many diseases present worldwide challenges has spurred nations and institutions to participate in the development of what is known as 'global health governance'. But this new form of governance will only succeed with strengthened country commitment, collaborations across disparate sectors and improved accountability.

In an era of rapid globalization, the world faces serious global threats to human health, including infectious and chronic diseases, antimicrobial resistance and inequitable access to medicines. Fortunately, since the mid-1990s, recognition of a need for action on global health has led to the creation of many new initiatives and mobilization of unprecedented resources.

Diseases do not recognize national boundaries, so tackling such illnesses requires collective action through effective global health governance (GHG), defined as the formal and informal institutions, norms and processes that govern or directly influence health policy and outcomes worldwide. To date, the institutional structures for collective action have mostly evolved in an ad hoc, rather than systematic, manner.

Whether there should be a single global health authority to allocate responsibilities and resources is debatable. Notwithstanding the existence of the 2005 Paris Declaration, in which governments pledged harmonization and alignment of the aid they provide, some would consider the idea of such a GHG authority an illusion. But there is no doubt that an absence of effective GHG will exacerbate the current fragmentation of objectives and poor coordination of supported activities, as well as the narrow focus on short-term results, large transaction costs on recipients and the lack of accountability.

Much experience has been gained in recent years with global health initiatives; a recent dialogue at the World Health Summit Working Session on Global Health Governance in Berlin last month identified three key messages for improving GHG in the future.

National authorities should be in the driver's seat in allocating donor money—but they must also pull their weight in improving conditions locally. Countries need to invest more of their own resources for health improvement and not rely mainly on external aid. They must strengthen their own capacities for better national governance, as progress globally ultimately depends on strong national health systems. This includes the capacity to negotiate with donors, to access resources that may be controlled by ministries other than the ministry of health (e.g. the ministry of finance), to allocate resources at the most appropriate level (national, district or local), to evaluate the impact of initiatives and to write proposals that are better aligned with national health needs.

Action across sectors is needed. Complex health challenges, such as HIV/AIDS, cancer, diabetes and cardiovascular diseases, require the involvement of many players beyond the health sector. Health is inextricably linked to human development; thus, effective governance must be linked to, for example, the emerging field of global health diplomacy, which lies at the interface of health, foreign policy and trade.

Partnerships should be democratic, inclusive and accountable. Going forward, partnerships in the global health sphere need to have three key characteristics: these alliances should be democratic, representing a 'level playing field' for all parties involved; inclusive, involving the private sector and civil society, helping all countries in need (and not just selected 'darling countries' of donors) and recognizing the importance of middle-income developing countries (for example, China, Brazil and India) as growing partners in health improvement efforts in a wide range of low-income countries; and accountable, incorporating independent evaluation of initiatives, which should be a prerequisite for such collaboration.

Similar themes were highlighted at the UN Summit on the Millennium Development Goals in New York in September, which reiterated the importance of country ownership of both the funding agenda and the administration of support, as well as the need for better alignment and accountability for results.

At the World Health Summit, there was a palpable sense of renewed commitment from some key stakeholders. This includes the convergence in objectives of major recent initiatives from the US and the EU and stronger linkages of these initiatives with agencies such as the Global Fund. There is also better awareness of the need for reform within the World Health Organization (WHO) so that it can play a stronger leadership role in GHG.

Health is global, but implementation is always local. A prime challenge is to resolve the tension between the need for results and local ownership and capacity building. Ultimately, those in greatest need should have a big say in setting the agenda.

Now that global health has gained recognition as a fundamental concept, the movement toward establishing effective GHG has begun; attention to signals from both donors and recipients will point to ways of improving it. Harmony and coordination is arguably necessary to ensure that GHG benefits those in greatest need. And emphasizing the underlying values of GHG—its value as a 'global public good' and its objectives of ensuring human dignity and serving underprivileged populations—as well defining its boundaries will be crucial to improving health going forward.

Meetings and Announcements

WHO/CDC Technical Consultation. WHO Estimates of Vitamin and Mineral Deficiencies: Methodological approaches to calculate global and regional prevalences and address uncertainty of the estimates. 7-9 December, 2010, Atlanta, GA, USA

WHO produces global estimates of vitamin and mineral deficiencies (VMD) to identify high-priority areas to target and implement micronutrient interventions; to advocate for resource allocation; and to assess the influence of vitamin and mineral deficiencies as risk factors to the overall global burden of disease. In order to develop a common approach to develop global estimates of VMD, the Departments of Nutrition for Health and Development and the Mortality and Burden of Disease Unit, WHO, and the International Micronutrient Malnutrition Prevention and Control Program (IMMPaCt), US Centers for Disease Control and Prevention convened a technical consultation on Dec 7-9, 2010, in Atlanta. Objectives of the technical consultation were: 1) review various methodological approaches and assumptions used in estimating vitamin and mineral deficiencies globally; 2) review available sources of data, taking into account their strengths and limitations; 3) review and discuss statistics used to address precision and accuracy of the estimates; 4) reach consensus on methods to estimate global vitamin and mineral deficiencies, and trends by micronutrient and subpopulations; 5) discuss the use of estimates for calculating the global burden of disease.

The WHO Vitamin and Mineral Nutrition Information System (VMNIS) currently collates information at the national, regional, state or local level on micronutrient deficiencies in populations. Based on this information, the Micronutrients Unit has published global estimates of the prevalence of iodine deficiency (1993-2003 and 2004-2007). Multiple approaches have been used to estimate the global burden of vitamin and mineral deficiencies, sometimes with low predictive accuracy. At the meeting, Michael Zimmermann, ICCIDD Deputy Regional Coordinator for Western and Central Europe presented an update for 2010 on the global prevalence of iodine deficiency and presented the current disease model that will be used to estimate the current global burden of disease due to iodine deficiency.

Upcoming meetings

The Endocrine Society Annual Meeting (ENDO 2011)

June 4-7, 2011
Boston, Massachusetts
Website: *www.endo-society.org/*

XIV Latin American Thyroid Association (LATS) Meeting

August, 4th – 7th, 2011
Lima, Peru
Website: *www.lats.org*

35th Annual Meeting of the European Thyroid Association (ETA)

September 10-14, 2011
Kraków, Poland
Website: *www.eta2011.com*

81st Annual Meeting of the American Thyroid Association

October 26-30, 2011
The Renaissance Esmeralda
Indian Wells , California
Phone: (703) 998-8890
Fax: (703) 998-8893
Website: *www.thyroid.org*

Abstracts

Geographical distribution of drinking-water with high iodine level and association between high iodine level in drinking-water and goiter: a Chinese national investigation

This study mapped the geographical distribution of drinking-water with high iodine level in China and determined the relationship between high iodine drinking-water (28 857 water samples from 1978 towns) and goiter prevalence and UIC. Of the 1978 towns studied, 488 had iodine levels between 150 and 300 μg/L in drinking-water, and in 246 towns, the iodine level was >300 μg/L. These towns are mainly distributed along the original Yellow River flood areas. Of the 56 751 children examined, goiter prevalence was 6.3 % in the areas with drinking-water iodine levels of 150-300 μg/L and 11.0 % in the areas with drinking-water iodine >300 μg/L. Goiter prevalence increased with water and urinary iodine levels. The present study suggests that drinking-water with high iodine levels is distributed in eleven provinces of China. Thus, it may be important to consider both iodized salt and drinking-water iodine as important dietary sources of iodine in these areas.
Shen H et al. Br J Nutr. 2011 Feb 15:1-5. [Epub ahead of print]

Endemic goiter in the Sudan despite long-standing programmes for the control of iodine deficiency disorders

The study described the status of IDD in the Sudan more than 25 years after the initiation of IDD control programs and explored the causes of endemic goiter in the country. Testing for IDDs was carried out in 6083 schoolchildren 6 to 12 years of age from the capital cities of nine states in different areas of the country by using the prevalence of goiter, laboratory measurements of UIC and serum thyroglobulin (Tg) levels. The prevalence of goiter was 38.8% overall. The overall median UIC was 66 μg/L, with the lowest median value in Kosti city (27 μg/L), situated in the center of the country, and the highest (464 μg/L) in Port Sudan, on the Red Sea coast. The highest mean serum Tg level (67 ng/ml) was found in Kosti city, which also had the highest prevalence of goiter. IDD is still a public health problem throughout urban areas in the Sudan.
Medani AM et al. Bull World Health Organ. 2011;89(2):121-6

Thyroid status of Space Shuttle crewmembers: effects of iodine removal

Iodine is often used for water purification and has been used throughout the U.S. space program. Because of concern about potential effects on crewmembers' thyroid function, in 1997 a system was implemented on board the Space Shuttles to remove iodine from water before it was consumed. This article reports thyroid hormone data from crews flying before and after this system was implemented, for 275 astronauts. Before iodine removal was implemented, thyroid stimulating hormone (TSH) was elevated in male and tended to be elevated in female astronauts, with average increases of 27% and 19% after flight, respectively. After iodine removal was implemented, postflight TSH was not significantly different from preflight values, suggesting that crewmembers' increase in serum TSH on landing day resulted from their consumption of iodinated water during spaceflight.
Smith SM et al. Aviat Space Environ Med. 2011;82(1):49-51.

Iodine concentration in cow's milk and its relation with urinary iodine concentrations in the population

Investigators showed that the mean iodine concentration in milk in southern Spain had increased from 1991 (117 ± 37 μg/L) to 2008 (259 ± 58 μg/L) in 362 samples of commercial milk. Urinary iodine concentrations in school children and adults were significantly and positively associated with the frequency of milk intake. The authors concluded cow's milk is a relevant source of dietary iodine in Spain.
Soriguer F et al. Clin Nutr. 2011;30(1):44-8.

Iodine deficiency disorders among primary school children in eastern Nepal

This study assessed the iodine status among school children of Dhankuta and Dharan in eastern Nepal in 2008. The median UICs of school children of Dhankuta and Dharan were 157 µg/L and 180 µg/L, respectively. The majority of children consumed packet salt. The percentages of salt samples with adequately iodized salt (≥ 15 ppm) were 81.3% in Dhankuta and 89.6% in Dharan. Eastern Nepal is continuously progressing towards the sustainable elimination of IDD as illustrated by optimal UIC and widespread consumption of adequately iodized packet salt.

Gelal B et al. Indian J Pediatr. 2011;78(1):45-8.

Consuming iodine enriched eggs to solve the iodine deficiency endemic for remote areas in Thailand

In northeastern Thailand, iodine-enriched poultry feed was fed in a model farm setting, and the iodine content of the iodine-enriched eggs was determined. Iodine status of volunteers (n=124) in two villages who consumed the iodine-enriched eggs for 5 days was monitored before and after iodine enrichment. The content of iodine in the fortified eggs was in the range of 94 to 98 µg per egg for a 55 to 65 g egg. The median baseline UIC before consuming eggs was 70 µg/L, which rose to 207 µg/L in one village and to 140 µg/L in the other, indicating good bioavailability of the iodine from the fortified eggs.

Charoensiriwatana W et al. Nutr J. 2010;20(9):68

Iodine intakes of 100-300 µg/d do not modify thyroid function and have modest anti-inflammatory effects

Thirty healthy Spanish adults with adequate iodine intake and normal thyroid function were assigned to three groups to receive a daily dose of 100, 200 or 300 µg of iodide in the form of KI for 6 months. The supplements did not modify thyroid function in the subjects but iodine showed a slight anti-inflammatory and antioxidative action.

Soriguer F et al. Br J Nutr. 2011 Jan 25:1-8. [Epub ahead of print]

Iodine status of Aboriginal teenagers in the Darwin region before mandatory iodine fortification of bread

This Australian study determined the iodine status of Aboriginal participants (n=376) in the Darwin Health Region in the Northern Territory prior to the introduction of mandatory iodine fortification of bread. Overall median UIC was 58 µg/L when weighted to the 2006 census population. Previously, iodine deficiency was thought to occur only in the southeastern states of Australia; this is the first report of iodine deficiency occurring in residents of the Northern Territory.

Mackerras DE et al. Med J Aust. 2011;194(3):126-30.

Urinary iodine deficiency in Gippsland pregnant women: the failure of bread fortification?

To assess iodine status among pregnant women living in south Australia, before and after introduction of iodine fortification of bread, a cross-sectional study of 86 pregnant women (at ≥ 28 weeks' gestation) was conducted in 2009-2010. The percentage of pregnant women with UIC >150 µg/L (indicative of iodine sufficiency) was 28%. There was no statistically significant difference in UICs before and since iodine fortification of bread. The median UIC before fortification was 96 µg/L (IQR, 45–153 µg/L) and since fortification was 95.5 µg/L (IQR, 60–156 µg/L). The dietary intake of iodine-rich food (including bread) and the use of appropriate supplements appeared insufficient to meet the increased iodine requirements during pregnancy in this population.

Rahman A et al. MJA 2011; 194 (5): 240-243

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