

The Public Health Imperative of Permanent Elimination of Iodine Deficiency

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INTRODUCTION

Iodine deficiency has afflicted humanity from ancient times. Throughout the millennia behind us, iodine deficiency has been a stealthy drag on the physical, mental and social development of millions upon millions of families and their children, by sapping their cognitive performance and their productivity, and by undermining their reproduction and survival. A prompt and effective remedy, seaweed, which, as we knew later is rich in iodine, was already in use over the millennia by physicians in China. We have since learned through a series of scientific studies that the solution to the global public health problem of iodine deficiency lies in the delivery of additional iodine to all members of society. And this can be achieved only by universal salt iodization.

Early in the year 2000 it may be too soon yet to declare global triumph over this age-old scourge. But it is not too soon to understand that we have arrived, for the first time in history, on the brink of virtual elimination of iodine deficiency. At this point in time, it is a privilege for all concerned to join the chorus of partners of the global IDD alliance in congratulating the productive salt producers everywhere with their key responsibility of providing the required additional iodine from iodized salt to all people of the world.

THE AGE OF IGNORANCE

Populations with iodine deficiency develop endemic goiter. A swollen neck due to goiter in young persons was considered in some communities a sign of handsomeness. Goiter has been part of the expressions of art and culture since ancient times. Cretinous dwarfs, representing severe neurological damage of iodine deficiency, were a common sight at the courts of Europe in the

Middle Ages. Early successful efforts at the correction of iodine deficiency in Canada, USA, Australia, Switzerland and other countries in Europe led to the belief in the 1950s among scientists that cretinism had disappeared from the earth and the global problem largely solved. They were wrong, as new research soon demonstrated that vast areas of the world continued to be affected by the severe developmental disorders due to iodine deficiency.

THE CENTURY OF DISCOVERY

During the past four decades, a more realistic picture has emerged of the broad spectrum, as well as the vast dimension of the consequences in a population affected by iodine deficiency. These consequences are not restricted to goiter and cretinism (Delange, 1994), although these are the easiest noticed among the signs and symptoms of iodine deficiency. For every cretin living in an iodine deficient community, however, two other pregnancies have ended either in miscarriage, stillbirth or early neonatal death. And the survivors in iodine-deficient populations suffer from a higher frequency of developmental and functional abnormalities, including speech, hearing, and neuro-muscular function (Clugston et al, 1987). To encompass the range of disabilities, dysfunction and death from inadequate iodine intake in the members of a society, the term Iodine Deficiency Disorders (IDD) was coined (Hetzel, 1983).

The true burden of iodine deficiency on society was not revealed yet from the sum of members affected by the various clinical syndromes, however. A series of careful studies, comparing groups of apparently healthy individuals in iodine deficient areas and those in neighboring areas

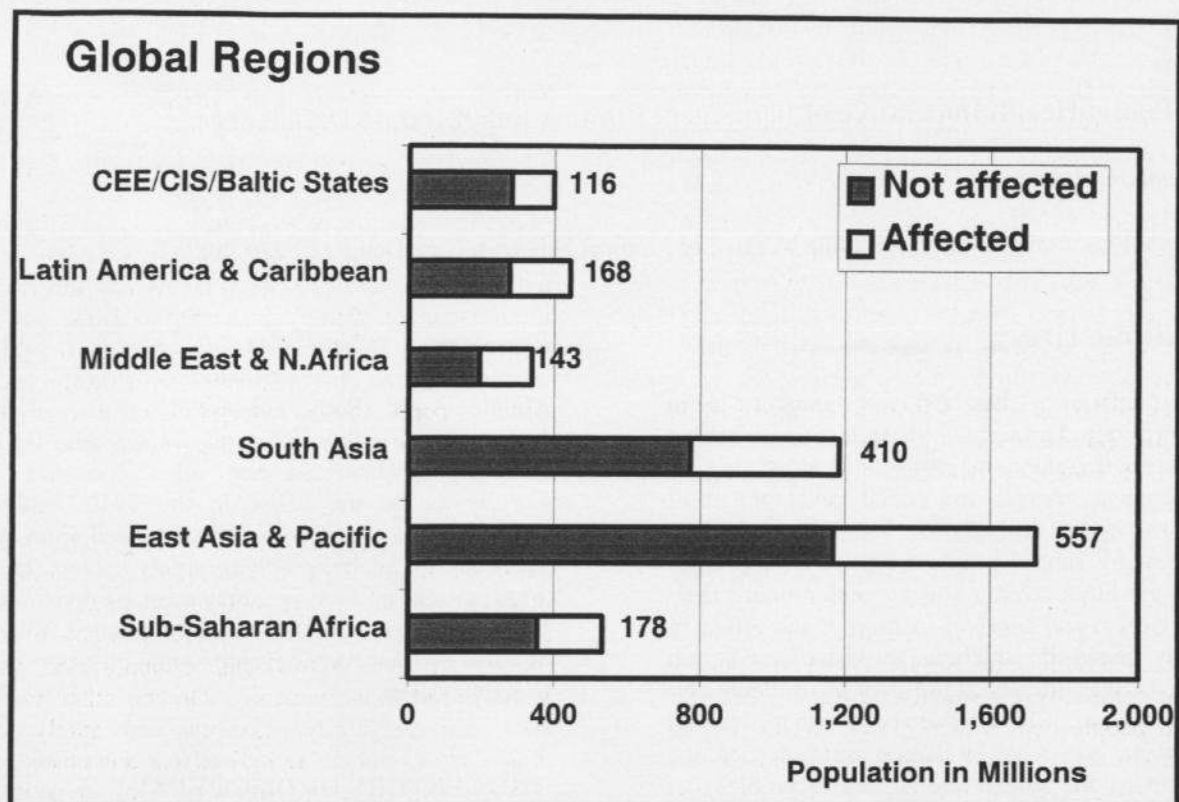


Figure 1: Population estimates for iodine deficiency, 1990 (WHO, 1993)

showed that when 5% or more of children of school age have goiter, the entire distribution of cognitive ability in the population was reduced by as much as 10-15 IQ points (Bleichrodt & Born, 1994). The realization finally dawned that iodine deficiency in affected populations impacts also on the intellectual performance of those members who have no apparent clinical symptom. This revealed the true nature of the public nutrition problem: In populations with iodine deficiency in a given area, all are affected, even if the impact on the individual is not perceived or clinically demonstrable. Hence the name "Hidden Hunger", introduced by the late Executive Director of UNICEF, James P. Grant, who said: "Like the iceberg, its bulk lies beneath the surface" (Grant, 1992).

By 1990, IDD had been documented in 118 countries, with more than 1.5 billion people, or one-third of the world's population, living in areas with iodine deficiency (figure 1). More than 11 million cretins were counted at that time, and 655 million people had evident goiter (WHO, 1993). These numbers put iodine deficiency among the most extensive nutritional obstacles to development of the world. At the same time, however, likely less than 10% of the 135 million newborns entering the world were protected against iodine deficiency from their mother's access to iodized salt during pregnancy.

The causal chain of disorders arising from iodine deficiency in humans is quite straightforward. Where the soil lacks iodine, local food and water provide insufficient dietary iodine for the thyroid gland to produce sufficient thyroid hormone for the developing brain and other tissues. While the exact mechanism at the molecular level of the resulting brain damage and other neurological and physical disorders has not yet been resolved, the simple chain of causation points to a simple solution: Add iodine to the diet. The main method of adding iodine to the diet of large populations is salt iodization. Salt iodization is feasible at any scale of salt production. The known technology (Hunnikin, 1964) is simple, cheap and rapidly effective. Common levels of iodine in salt are safe and do not impart any risk for the population

segment with sufficient iodine status (WHO, 1994).

Early in this century in the USA, a reduction of goiter and improvement of iodine status in school children was accomplished upon the regular supply of an iodine source. When a law permitting salt iodization was passed in Switzerland in 1922, the salt industry responded by establishing an industrial process only two years later. And soon more countries of the Western world where goiter was endemic followed. Under widely varying conditions, it has been the consistent finding that goiter in populations is reduced after the supply of iodized salt to markets and households (Lamberg, 1985).

To summarize, the worldwide magnitude and nature of the disorders due to iodine deficiency in mankind are now understood to accumulate to an insidious obstacle to the optimal development and productivity of individuals, communities and nations, and thus, humanity. On the other hand, IDD can be easily, cheaply and safely be eliminated by supplying iodized salt universally. It was this unique combination of facts -a sinister mass development problem, and an available uncomplicated solution- that captured the imagination of the leaders of the world when they agreed in 1990 on the global goal of virtual elimination of IDD by the year 2000 (First Call for Children, 1990).

THE DECADE OF ACTION

Upon urging for priority for IDD by Member States at the World Health Assembly in May 1990, the Heads of State and Government attending the World Summit for Children in September 1990 made a commitment to "virtually eliminate iodine deficiency disorders by 2000". The Policy Conference on Hidden Hunger in 1991 translated this political goal to national policy guidelines. Delegations, composed of multiple sectors from countries worldwide at the International Conference on Nutrition in 1992 formulated a framework for national action.

The experience gained in IDD elimination during the last decade demonstrates that the international community can indeed set itself a goal and achieve it. During the decade of the 1990s, many have worked to perfect the science, refine the public health perspective and augment the acceptance of do-able actions. For instance, there now is global consensus of iodine deficiency as the single most preventable cause of decreased cognitive performance in the population, rather than increased thyroid volume only in some individuals. Other examples of progress in the science and its application are the consent in the laws of most countries to the best fortificant, namely potassium iodate. Also the acceptance of universal salt iodization in countries with initial resistance by certain physicians on clinical considerations, and the realization that free trade among countries offers room for fair competition by all bona-fide salt producers, small and large, are examples of significant barriers that have been overcome.

The last decade also has demonstrated that the global community when motivated by a measurable goal and strong leadership can mobilize elements of society not accustomed to collaborate in the pursuit of a global public health victory. In the early years of the decade, it were particularly the UN agencies, not-for-profit expert bodies such as the International Council for Control of Iodine Deficiency Disorders (ICCIDD, 1996) and medical scientists who contributed to the advocacy and communications to ensure that the elimination of IDD became a key issue globally and nationally. But it has been the private salt companies everywhere that took the decision of making the necessary investments for manufacturing and selling only iodized salt to their customers for public consumption. And when additional support funds were needed to accelerate the pace of achievement, the civic volunteer organization Kiwanis International joined the global alliance and started raising funds, channeling their contributions through the extensive UNICEF network in countries.

Most importantly however, the global agreed-upon goal and framework for national action has indeed led to building national programs and partnerships in virtually all countries with the public health threat. It is at the national levels that the global

fight against IDD is won, through steadfast work to pull all elements of the society together for reaching the public nutrition goal. The experience of the decade shows that national IDD coordinating bodies in country after country started to allow for contributions from all sectors, with the best available talents, while learning to share the ownership of the program and its success.

GLOBAL STATUS OF UNIVERSAL SALT IODIZATION FOR IDD ELIMINATION

A major focus during the decade of the 1990s therefore was on building and consolidating the various components and stages of national IDD programs, with the main aim to increase access by consumers to the protection afforded from iodized salt. Intensifying from the middle of the decade, WHO and UNICEF with a range of collaborators have prepared reports to show progress while it occurred (UNICEF, 1998).

In 1999, a report to Member States at the World Health Assembly (WHO, 1999) showed that of the 130 countries with either known or likely IDD, 105, or 81%, reported a national inter-sectoral coordinating body, and 98, or 75%, had a law on iodized salt in place. And in 95, or 73%, monitoring systems were reportedly in place. These numbers demonstrate the determination to mobilize the organizational resources for national action all over the world. And the outcome of this determination, measured from the increase in access to iodized salt from the consumer markets is equally impressive. By end 1999, 67%, or two-third of all households worldwide had iodized salt (Figure 2), and the Latin America & Caribbean region as a whole was at the brink of reaching 90%. The data for these estimates were from surveys in 100 countries out of the 163 where UNICEF has country offices. In the last year alone, 75 million newborns entered the world free of IDD because of the relief from iodine deficiency provided by the use of iodized salt (Figure 3). And among these, some 8-11 million were spared from clinical mental retardation.

Also the range and variety of scientific contributions in this salt industry-sponsored

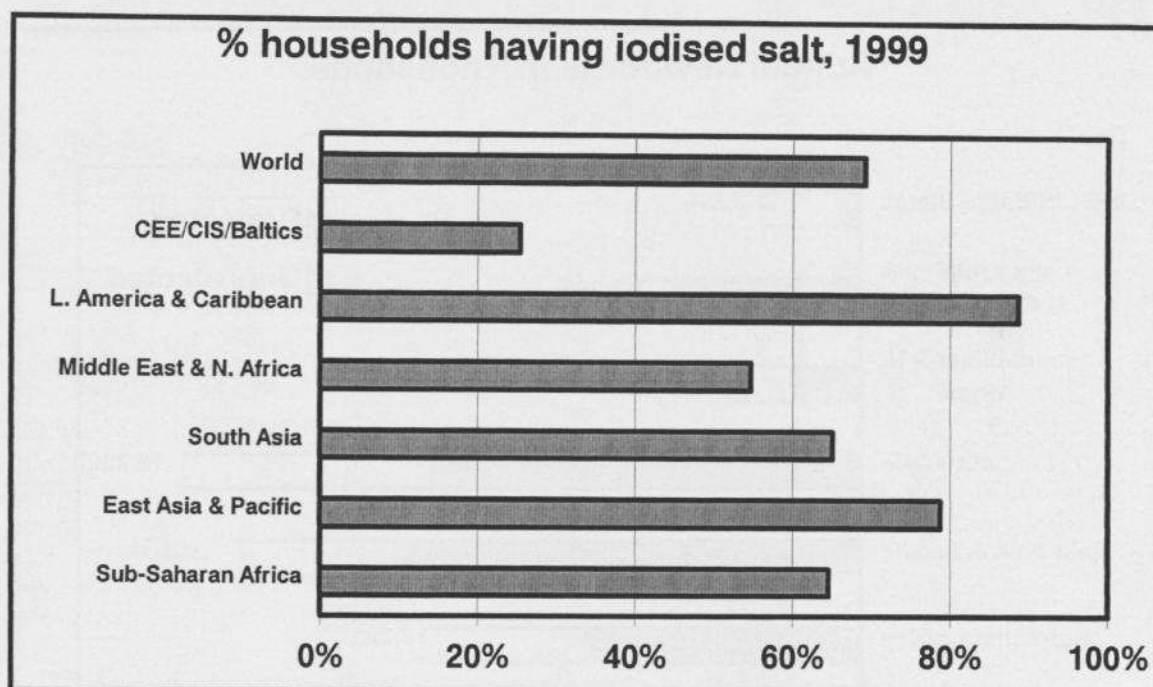


Figure 2: Percentage of households using iodized salt, end 1999 (UNICEF surveys).

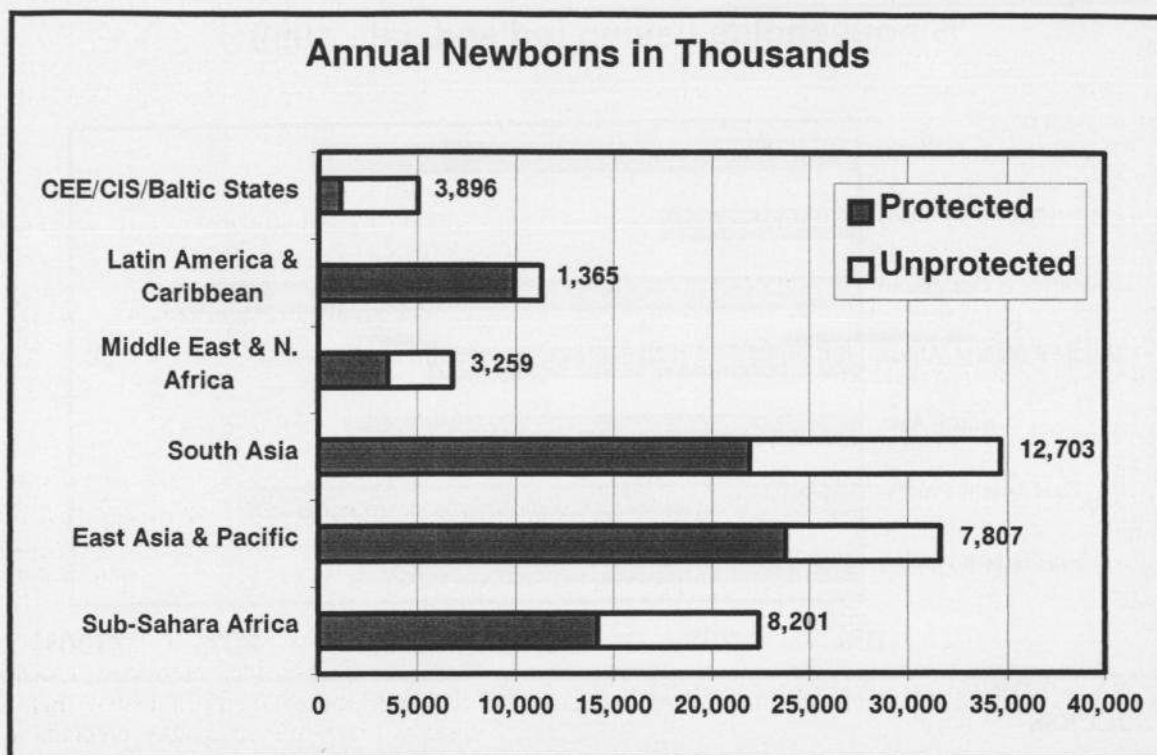


Figure 3: Number of newborns per annum protected from iodine deficiency by the use of iodized salt, 1999.

Symposium will testify to the many accomplishments of the decade. In summary, this decade will be remembered for the history of how UN agencies, the salt industry and its allied businesses, non-governmental organizations, specialist scientists and practitioners from all sectors have collaborated in the global effort to reach the common goal of IDD elimination. The decade of the 1990s will equally be remembered for the demonstration of how national public officials and the private salt industry re-enforced each other's responsibilities and actions for a tremendous public nutrition benefit.

These are no mean achievements. As Gro Harlem Brundtland, Director-General of the World Health Organization, said at the previous World Health Assembly: "When elimination of IDD is achieved, it will be a major and total public health triumph, ranking with small pox and poliomyelitis" (WHA, 1999).

THE WAY FORWARD TO SUSTAINING THE SUCCESS

At this point in time, after the ages of ignorance, the near-century of discovery and the decade of action, the nations of the world are at the apex of their actions and humankind at the brink of success - A position not frequently come upon. Of course, in some places that are lagging behind in the global progress, renewed vigor is needed for catching up. And in other places, extraordinary circumstances such as wars or internal strife may require longer patience, or extraordinary actions.

In the decade behind us, many have become accustomed to the action required to pursue elimination. The success of the achievement from such actions, as shown, is extraordinary. The need at this point in time is to understand that action required for sustaining the success may be different. Our challenge today is to proceed with the determination to assure that what is being achieved will last forever. Unlike smallpox, where immunization and case tracking of the disease was able to annihilate its cause, universal salt iodization only addresses iodine deficiency as the

cause of IDD. The origin of the problem, namely, environmental lack of iodine, remains. To sustain the success of IDD elimination forever, therefore, edible salt manufacturers must continue iodizing edible salt for their customers forever.

In broad terms, sustaining IDD elimination by salt iodization into the future will require adherence to the following principles:

- All actors in the global IDD elimination partnership must be seized by one notion, and guide their activities accordingly, namely, brain damage as the most devastating component of IDD;
- It is the right of people everywhere to have access to a nutritionally balanced intake of iodine from quality iodized salt. Universal means all salt for consumption, for all people. Universal also has the connotation of "always";
- Salt producers of the world particularly, but also their allied businesses in food processing, salt trade and retail, must assure that their customers are offered quality products at an acceptable price;
- It is the obligation of governments, from the range of international agreements, to permanently assure official, transparent support for universal salt iodization;
- No public health program can be successful without constantly renewed political commitment;
- The social sector, via international organizations like Kiwanis, as well as national organizations representing a variety of consumer interests, must continue insisting on national oversight;
- The national and international scientific community must continue seeking new knowledge, but equally importantly, must continue demanding the successful application of existing knowledge. While biomedical evidence to serve as a base for public health policy is essential, a social and behavioral orientation is key to successful elimination;
- Communication is the underpinning of the program strategy through information

dissemination, dialogue and resolution of conflicting interests;

- Broad alliances between groups are necessary. The Salt Industry, wholesalers and retailers, food processors, consumer groups, school administrators, teachers and students, medical and health institutions – each has a place in establishing and sustaining the new norm of using iodized salt. The lowly vendors of common salt at the peripheral outlets should not be neglected. Education must permeate the entire salt chain. There are more people selling salt than there are health educators.

NEXT STEPS

The frontiers for action, outlined by these principles, imply a number of challenges for the members of the global coalition that was formed from the decade of action behind us. Among these, the principal challenge is the idea that the salt producers of the world take special pride in the sustained elimination of IDD by ensuring quality products, appropriately packaged and labeled, with the right content of iodine, forever reaching all households. The salt industry is in a unique position to take the leadership. When it chooses to do so, others will follow:

- UN agencies will provide support by its resolutions in global bodies, by continued attention to making the success permanent, and by pressing governments and others to report on the evidence;
- Governments will find the minimum essential resources required for continued coordination, and for regular reviews and public reports of progress;
- Salt producers individually and by association will continue seeking renewal of their commitment, and establish applications of modern methods and state-of-the-art technology for quality iodization and consumer satisfaction;
- International scientific bodies such as ICCIDD will continue supporting the global and national perfection of knowledge and

technology, and civil organizations will raise its voice if progress or permanence slides.

CONCLUSION

In the matters of progressing towards the elimination of IDD in country after country, the community of nations has learned that no single actor can succeed by going it alone. Government is limited in what it can do in universal salt iodization. The private salt industry is limited too in national program matters, and so is the civil society. However, if combined through mutually supportive actions and managed nationally, the talents of government, industry and civil society, buttressed by support from scientific and international origins, can proceed along the new path of national human, social and economic development. The experience and expertise obtained from such collaborative endeavors will open the doors to the new opportunity for accelerating progress in public nutrition. We have the knowledge; we have the power; we have the potential to forever eliminate IDD. What we need is human will.

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