



WORLD HEALTH ORGANIZATION

EXECUTIVE BOARD
103rd Session
Provisional agenda item 8

EB103/27
12 November 1998

Iodine deficiency

Report by the Secretariat

Submitted to the Executive Board for information

BACKGROUND

1. Although the importance of iodine for preventing endemic goitre has been recognized for more than a century, it is only during the past 30 years that a wide range of harmful effects of iodine deficiency has been described. Although cretinism, a condition characterized by severe brain damage occurring in very early life, is both the most well known and the most serious of these effects, of greater significance are the more subtle degrees of mental impairment which occur in apparently normal children in iodine-deficient areas. The consequences are pervasive: they include poor school performance, reduced intellectual ability and impaired work capacity. Communities in remote mountainous regions are usually considered to be most at risk of iodine deficiency. However, it has been increasingly identified in other areas after the concept of endemic goitre was extended by the development of new indicators of iodine deficiency, in addition to goitre prevalence. These include measurement of iodine levels in urine and of thyroid-related hormones in blood, and assessment of thyroid size using ultrasonography.
2. The term iodine deficiency disorders was coined in 1983 to underscore the wide range of serious adverse effects of iodine deficiency.¹ The adoption of this term proved a turning point in raising awareness of the problem and galvanizing governments and international agencies into action. In 1990, the Health Assembly recognized that iodine deficiency is the world's greatest single cause of preventable mental retardation, and established the goal of eliminating it as a public health problem by the year 2000.²
3. Iodine deficiency has been identified as a significant public health problem in 129 countries (see the table below). At least 1500 million people, or 29% of the world's population, live in areas at risk of iodine deficiency.³ In 1997 WHO estimated that between 500 and 850 million of these are affected by goitre: eight of the most populous countries in the world,⁴ which make up 54% of the world's population, have

¹ Hetzel B.S. Iodine deficiency disorders (IDD) and their eradication. *Lancet*, 1983; **2**: 1126-1127.

² Resolution WHA43.2.

³ WHO/UNICEF/International Council for the Control of Iodine Deficiency Disorders. Global prevalence of iodine deficiency disorders, *MDIS Working Paper No. 1*, Geneva, World Health Organization, 1993.

⁴ Bangladesh, Brazil, China, India, Indonesia, Nigeria, Pakistan and Russian Federation.

a significant iodine deficiency problem. Together, they account for 72% of the world's population affected by iodine deficiency disorders.

PROGRESS SINCE 1990 IN ELIMINATING IODINE DEFICIENCY DISORDERS

WHO region	Number of countries	Number of countries					
		Countries with iodine deficiency disorders*	Legislation on universal salt iodization	Monitoring		Progress towards universal salt iodization	
				Quality of iodized salt	Iodine status	Population coverage	
						10% to 50%	Above 50%
Africa	46	44	35	26	20	9	18
The Americas	35	18	18	18	18	0	18
South-East Asia	10	10	8	8	4	4	6
Europe	51	31	13	9	7	4	6
Eastern Mediterranean	22	17	15	15	12	5	10
Western Pacific	27	9	10	8	4	3	4
Total	191	129	99	84	65	25	62

* Including countries where disorders are known or likely.

4. The main strategy for the control of iodine deficiency disorders is universal salt iodization, but sustainable elimination cannot be achieved by this means alone. The first step in the development of a national prevention and control programme is to establish a suitable mechanism responsible for coordinating the sectors involved in the control of iodine deficiency disorders and for overseeing the programme. Later stages include carrying out baseline assessments; preparing plans of action; winning political support; communicating with the public and other sectors, and writing, enacting and enforcing legislation on salt iodization. In high-risk areas, where considerable delays in access to iodized salt are likely, iodized oil should be given to women and children. Monitoring the impact of iodization programmes is essential in order to ensure adequate and continuing coverage.

5. During the past decade, tremendous progress has been made towards eliminating iodine deficiency disorders. WHO, in collaboration with UNICEF, the International Council for the Control of Iodine Deficiency Disorders, and other international organizations, bilateral agencies and nongovernmental

organizations, has played a crucial role in supporting national governments to this end. The table above summarizes progress in each of the six regions.¹

6. To date, 67% of the countries affected by iodine deficiency disorders have made progress towards achieving universal salt iodization, and 48% have made substantial progress (defined as more than half the population currently consuming iodized salt). The percentage of the latter group of countries is highest in the Region of the Americas (100%), followed by South-East Asia (60%), Eastern Mediterranean (59%), Western Pacific (44%), Africa (41%), and Europe (19%). Of the eight most populous countries with iodine deficiency disorders, all but two have made significant progress towards achieving universal salt iodization. Thirty countries where deficiency disorders are known or likely have yet to report any control activities.

7. Although 87% of countries implementing salt iodization programmes report that they are monitoring the quality of iodized salt, monitoring needs to be strengthened in many of them. In addition, 74% of countries have reported a monitoring system for iodine status, most often based on goitre prevalence. A growing number of countries are now measuring iodine in urine, which is the key indicator recommended for assessing the impact of deficiency control measures. Few countries have yet to carry out surveys of the prevalence of deficiency disorders after implementation of salt iodization. However, in those that have,² the change has been dramatic, leading to a drop in goitre prevalence and a rise in urinary iodine in affected areas.

ISSUES

8. Despite the achievements of the past decade, problems remain: (i) iodized salt is not reaching all target communities, in particular the most disadvantaged; (ii) the plethora of small-scale salt producers makes salt iodization programmes difficult to implement in some countries; (iii) some salt producers are unwilling to pay for potassium iodate, which is the recommended agent for iodization, or use less than the required amount; (iv) there is frequently unacceptable variation in the quality of iodized salt; (v) many salt iodization programmes are not being adequately monitored; (vi) a related problem is the lack of laboratory facilities in many countries for monitoring salt and urinary iodine levels; (vii) a transient increase in the incidence of hyperthyroidism has been identified in some countries after salt iodization.

9. The most important issue at present is the long-term sustainability of salt iodization programmes. Priority needs are to establish and improve links with the salt industry so as to ensure continuing high quality salt iodization, to support small-scale salt producers, and to set up adequate structures for monitoring both salt iodization and its impact on the iodine status of the population. Alternative strategies are also needed for iodization in areas where iodized salt will not be available in the foreseeable future. Growing evidence that iodine deficiency may be reappearing in some countries where it had previously been eliminated underscores the need for continued monitoring of the iodine status of populations that have been at risk in the past.

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¹ Excludes countries which eliminated disorders before 1990: Australia, Austria, Finland, France, Hungary, Netherlands, Norway, Poland, Slovakia, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland, United States of America.

² For instance, Algeria, Bolivia, Bhutan, Cameroon, China, Indonesia, Peru, Thailand, Zimbabwe.