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REGIONAL OFFICE FOR EUROPE

COMPARATIVE ANALYSIS OF PROGRESS ON THE ELIMINATION OF IODINE DEFICIENCY DISORDERS

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2000 EUROPEAN HEALTH21 TARGET 11

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HEALTHIER LIVING

By the year 2015, people across society should have adopted healthier patterns of living

(Adopted by the WHO Regional Committee for Europe at its forty-eighth session, Copenhagen, September 1998)

ABSTRACT

The World Health Organization (WHO) and the World Summit for Children established an objective in 1990 for the global elimination of iodine deficiency disorders (IDD) by the year 2000. A mid-decade target for universal salt iodization was adopted to accomplish this objective. Consequently, a worldwide action plan has been initiated to promote programmes to overcome IDD. The information presented in this document has been assembled from questionnaires completed by nutrition counterparts at ministries of health in the participating countries regarding information on IDD prevalence rates and programmes to combat them. This document provides a useful tool to assess the current IDD situation in Europe and its sub-regions and the steps taken by governments to solve the problem. WHO, the International Council for Control of Iodine Deficiency Disorders and the United Nations Children's Fund (UNICEF) encourage and support national authorities in planning, implementing, monitoring and evaluating the policies relating to elimination of IDD from the world. Policy-makers are encouraged to use this report as a tool for measuring the level of implementation of the global goal for elimination of IDD by 2000.

Keywords

IODINE DEFICIENCY
DEFICIENCY DISEASES – prevention and control
SODIUM CHLORIDE, DIETARY – therapeutic use
GOITER – prevention and control
COMPARATIVE STUDY
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CONTENTS

Page

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Foreword

Iodine deficiency disorders (IDD) are the single most common cause of preventable mental retardation and brain damage in the world. In areas of endemic iodine deficiency, where soil and consequently crops and grazing animals do not provide sufficient dietary iodine, food and animal fodder fortification and supplementation have proved to be highly successful and sustainable.

The World Health Organization (WHO), United Nation's Children's Fund (UNICEF) and the International Council on Control for Iodine Deficiency Disorders (ICCIDD) are working together to address the problem of IDD. In this connection, a Meeting on Elimination of Iodine Deficiency Disorders in Central and Eastern Europe, the Commonwealth of Independent States and the Baltic States was held in Munich in September 1997. The main objective of this Meeting was to review the current status of IDD in the European Region, to identify the major constraints in the proper implementation of effective control measures and to develop practical approaches to overcome the constraints. This led to a plan of action at regional and national levels for the elimination of IDD. The governments of the participating nations were urged to strengthen their commitment to the elimination of IDD. Agencies and nongovernmental organizations were recommended to provide training and technical assistance, exchange information and stimulate interaction between the food industry and other sectors to promote universal salt iodization (USI). USI aims to supplement with iodine the salt that is used in agriculture, by the food industry and in households and is the recommended strategy for the elimination of IDD.

We are extremely grateful to nutrition counterparts and ministries of health who invested the time and effort to return the completed questionnaires regarding the prevalence of IDD and efforts to combat them in their countries. We hope that the information collected in this document on the current status of IDD in Europe will be useful for assessing the gravity of the situation in the WHO European Region. It should be noted that the validity of the data is less important than the fact that the results may vary significantly from the results of similar surveys in the same countries conducted by sectors other than the health sector. Indeed, the existence of such differences would be most interesting and governments and other sectors should ask questions about them. Different results provided by governments or different ministries in the same country could present an excellent lobbying opportunity for those interested in protecting public health. This document is ultimately a lobbying tool which seeks to stimulate debate and attempts to find out which results are correct and whether the measures needed to eliminate IDD and protect public health are affected. The fact that many of the questions were not answered allows investigations to be carried out to find out why.

It was a difficult task to allocate countries to sub-regions and we hope that the approach we developed is useful and aids comparison. Our effort does not represent any official categorization of WHO Member States; we used this merely to simplify the analysis and interpretation of the data by the reader.

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Introduction

Iodine is necessary for the synthesis of the thyroid hormones. Nearly 80% of the iodine in the body is found in the thyroid gland. Most of it is in the thyroid hormones (1). The amount of iodine in drinking-water and crops generally depends on the iodine content of local soil.

Iodine deficiency is the single most important cause of preventable brain damage and mental retardation. The World Health Organization (WHO), the United Nations Children Fund (UNICEF) and the International Council for Control of Iodine Deficiency Disorders (ICCIDD) estimated that in the early 1990s, at least 1572 million people worldwide were at risk of IDD and at least 655 million were affected by goitre. An estimated 43 million were afflicted by some degree of mental retardation and 11 million by overt endemic cretinism (2). Although visible goitre as a "disease with a swollen neck" has been around for a long time, IDD's devastating mental and physical impact on fetuses and children has only been fully recognized in recent decades (3). The earth's soil has continued to lose iodine due to rains, floods, erosion and over-cultivation and there is no evidence that this trend can be reversed. The world community has also agreed that the strategy in fighting IDD is universal salt iodization (USI), which calls for all salt used in agricultural, food processing/manufacturing, catering and household procedures to be iodized.

Virtual elimination of IDD can only be achieved and sustained when USI becomes the norm. Such a norm implies general knowledge of the ill effects of IDD and the need to consume minute amounts of iodine regularly.

The three international agencies charged with leading the fight against IDD – ICCIDD, UNICEF and WHO – have drawn up principles (4,5) to guide governments on how to identify the following priorities for a national monitoring programme:

- establishing a committee;
- carrying out quality control of iodine concentration in salt;
- setting up an independent laboratory to ensure external quality control;
- establishing sentinel sites for the periodic assessment of salt iodine levels in retail outlets and households;
- conducting occasional goitre prevalence surveys;
- making regular measurements of urinary iodine;
- making rapid interventions as a result of monitoring through good communication links with health professionals and the food industry.

For a long time, iodine deficiency has been greatly underestimated in European countries and has not generally been considered a significant problem. Surveys carried out in the 1980s clearly demonstrated the persistence of moderate to even severely affected areas, especially in the eastern and southern parts of the continent (6). An important step in the evaluation of IDD in Europe was a workshop in Brussels in April 1992, which summarized current information on iodine nutrition with the aim of proposing practical measures to correct iodine deficiency (7). Since then, the IDD situation in Europe has changed: a recent survey showed that iodine

nutrition has improved, at least in some countries (8), although IDD still remain a significant problem in many other countries of central and eastern Europe (CCEE), the Commonwealth of Independent States (CIS) and the Baltic states (9).

In 1990, the World Health Assembly and the World Summit for Children established a global goal for the elimination of IDD by 2000. The programmes to achieve this goal have been implemented mostly through iodization of edible salts, thus ensuring that human populations that previously witnessed the birth of numerous brain-damaged infants and high rates of mental impairment and goitre are now able to develop to their full capacity, assuming no other deficiencies exist. In September 1997, ICCIDD/UNICEF/WHO organized a regional Meeting in Munich, Germany on the Elimination of IDD in Central and Eastern Europe, the Commonwealth of Independent States and the Baltic States (9,10). The main objectives of the Meeting were:

- to review the current status of the IDD in the CEE, CIS and Baltic states;
- to identify the main constraints on the implementation of effective salt iodization and IDD elimination programmes in the target countries;
- to consider practical approaches to overcoming such constraints, primarily through the examination of successful experience in countries with effective IDD programmes; and
- to devise plans of action at regional and national levels with the goal of eliminating IDD by 2000.

The conference was successful in identifying the extent of IDD and the status of salt iodization measures taken in each country. An estimate was made of the level of financial and material resources required to reach the goal of IDD elimination on a country by country basis. It was evident that although sufficient funding was available from domestic and external sources to enable each country to overcome any obstacles to USI, monitoring, quality control and enforcement of legislation still remained problematic. These were, however, seen as areas which could be successfully addressed with a sound management approach.

The elimination of IDD through USI is an achievable goal for every country in the Region. It can be achieved primarily through the enactment and enforcement of appropriate legislation and regulations, and through the investment of a minimal amount of funding in upgrading iodization technology. These two basic requirements, in combination with the establishment of a good management structure and an effective monitoring and quality assurance system, form the core of all successful salt iodization programmes to be found anywhere in the world (11).

The challenge to governments is to ensure sustainability of the success that can be achieved through USI and verification of the elimination of IDD as a public health problem (12).

Aim of the report

This report is an analysis of the progress made towards achieving the operational targets for elimination of IDD in WHO European Member States. The information collected will help to:

- provide a comparative analysis of the situation in 1998/1999;
- identify gaps and areas where more emphasis and action are needed;

- assist countries in planning future strategies and developing their relevant plans of action to eliminate IDD; and
- provide a baseline against which to measure progress.

Method

A standard questionnaire in English and Russian (Annex 1) was posted or e-mailed in September 1998 to 49 nutrition counterparts (nominated by ministries of health), or ministries of health where no counterparts existed, in WHO European Region Member States. Thirty-four completed responses (response rate 69%) were received and the Nutrition Programme at the WHO Regional Office for Europe compiled this report on the basis of those responses.

Four other Member States (Armenia, Belgium, Italy and the Russian Federation) completed the questionnaire during 1999.

To facilitate comparative analysis and interpretation and for the purposes of drawing conclusions and making recommendations, Member States were grouped into eight geographical sub-regions: the Balkan countries, the Baltic countries, the central Asian republics (CAR) and Turkey, central and eastern Europe (CEE), western Europe, southern Europe, the Commonwealth of Independent States (CIS) and the Nordic countries (Table 1). The country data are presented in Tables 2–6.

Table 1. Member States of the WHO European Region to which the questionnaire was sent

Balkan countries	Baltic countries	CAR and Turkey	CEE	Western Europe	Southern Europe	CIS (excluding CAR)	Nordic countries
Albania Bosnia & Herzegovina Croatia Slovenia The Former Yugoslav Republic of Macedonia	Estonia Latvia Lithuania	Kazakhstan[a] Kyrgyzstan[a] Tajikistan[a] Turkey Turkmenistan[a] Uzbekistan	Bulgaria Czech Republic Hungary Poland Romania Slovakia	Austria Belgium France Germany Ireland Luxembourg Netherlands Switzerland United Kingdom	Andorra Greece[a] Israel[a] Italy Malta[a] Monaco[a] Portugal San Marino[a] Spain[a]	Azerbaijan Armenia Belarus Georgia Republic of Moldova Russian Federation Ukraine	Denmark Finland Iceland Norway Sweden

[a]No completed questionnaire received.

Results of the survey

Table 2. Information on the prevalence of IDD and the action plan

Country/region	Prevalence of IDD	Assessment of magnitude	Level of assessment	Action plan for IDD	Year adopted	Revisions
Balkan countries						
Albania	Y	Y	NAT	Y	1993	N
Bosnia and Herzegovina	Y	N	NA	N	NA	NA
Croatia	Y	Y	NAT	Y	1993	1996
Slovenia	Y	Y	NAT	Y	NA	NA
The Former Yugoslav Republic of Macedonia	Y	Y	NAT	Y	1998	N
Baltic countries						
Estonia	U	N	NA	N	NA	NA
Latvia	U	N	NA	N	NA	NA
Lithuania	Y	Y	SNAT	Y	1998	NA
CAR and Turkey						
Turkey	Y	Y	NAT	Y	1994	1998
Uzbekistan	Y	Y	NAT	Y	1971	N
CEE						
Bulgaria	Y	Y	NAT	Y	1958	1994
Czech Republic	Y	Y	NAT	Y	1995	1998
Hungary	Y	Y	NAT	Y	1994	N
Poland	Y	Y	NAT	Y	1997	N
Romania	Y	NA	NA	Y	NA	NA
Slovakia	N	NA	NA	In planning	NA	NA
Western Europe						
Austria	Y	Y	NAT	N	NA	NA
Belgium	Y	Y	NAT	In planning	–	–
France	Y	Y	NAT	Y	1952	1998
Germany	Y	Y	NAT	Y	1996	N
Ireland	N	N	NA	N	NA	NA
Luxembourg	Y	Y	NAT	In planning	NA	NA
Netherlands	Y	Y	SNAT	Y	1984	1999
Switzerland	Y	Y	NAT	Y	1922	1998
United Kingdom	N	Y	NAT	N	NA	NA
Southern Europe						
Italy	Y	Y	NAT	In planning	–	–
Portugal	Y	Y	NAT	N	NA	NA
CIS						
Azerbaijan	Y	Y	NAT, SNAT	In planning	NA	NA
Armenia	Y	Y	NAT	In planning	NA	NA
Belarus	Y	Y	NAT	In planning	–	N
Georgia	Y	Y	NAT	Y	1996	1997
Republic of Moldova	Y	NA	NA	Y	1998	N
Russian Federation	Y	Y	SNAT	Y	1998	N
Ukraine	Y	N	NA	In planning	NA	NA
Nordic countries						
Denmark	Y	Y	NAT	Y	1995	N
Finland	N	Y	NAT, SNAT	N	1949	N
Norway	N	Y	NAT	N	NA	NA
Sweden	NA	NA	N	NA	NA	NA

Y = yes, N = no, NA = no answer, NAT=national, SNAT=sub-national, U=unknown.

Table 3. Institutional support

Country/region	National coordinating committee for IDD control	Year set up	Composition				Ministry supporting IDD
			Ministry of Health	Ministry of Agriculture	Ministry of Education	Other	
Balkan countries							
Albania	Y	1994	Y	–	–	–	Health
Bosnia and Herzegovina	N	NA	NA	NA	NA	NA	NA
Croatia	Y	1992	Y	N	N	Y	Health
Slovenia	NA	NA	Y	–	–	–	Health
The Former Yugoslav Republic of Macedonia	Y	1998	Y	Y	Y	Y	Health
Baltic countries							
Estonia	N	NA	NA	NA	NA	NA	NA
Latvia	N	NA	NA	NA	NA	NA	NA
Lithuania	Y	1998	Y	Y	Y	Y	Health
CAR and Turkey							
Turkey	Y	1994	Y	Y	–	Y	Health, Child Health
Uzbekistan	In planning	NA	Y	Y	Y	–	Health
CEE							
Bulgaria	Y	1994	Y	Y	N	Y	Health
Czech Republic	Y	1990	Y	Y	N	Y	Health
Hungary	Y	1994	Y	–	–	Y	Health
Poland	Y	1991	Y	–	–	Y	Health and Social Welfare
Romania	Y	NA	Y	–	–	–	Health
Slovakia	In planning	NA	NA	NA	NA	NA	NA
Western Europe							
Austria	N	NA	NA	NA	NA	NA	NA
Belgium	Y	1993	Y	–	–	Y	Health
France	N	NA	NA	NA	NA	NA	NA
Germany	Y	1984	–	–	–	Y	NA
Ireland	N	NA	NA	NA	NA	NA	NA
Luxembourg	In planning	NA	NA	NA	NA	NA	Health
Netherlands	N	NA	NA	NA	NA	NA	NA
Switzerland	Y	1922	–	–	–	Y	Academy of Medical Scientists[a]
United Kingdom	N	NA	NA	NA	NA	NA	NA
Southern Europe							
Italy	Y for research	1985	–	–	–	Thyroid-ologist	University
Portugal	N	NA	NA	NA	NA	NA	NA
CIS							
Azerbaijan	In planning	NA	NA	NA	NA	NA	NA
Armenia	In planning	NA	NA	NA	NA	NA	NA
Belarus	In planning	NA	Y	Y	Y	Y	Health
Georgia	Y	1996	Y	Y	Y	Y	State Chancellery
Republic of Moldova	Y	1998	Y	Y	Y	Y	Health
Russian Federation	N	–	–	–	–	–	–
Ukraine	Y	1997	Y	–	–	Y	Health
Nordic countries							
Denmark	Y	1995	–	–	–	Y	Food, Agriculture and Fisheries
Finland	Y	1954	Y	Y	–	Y	Health
Norway	N	NA	NA	NA	NA	NA	NA
Sweden	N	NA	NA	NA	NA	NA	NA

Y = yes , N = no, NA = no answer.
[a]Nongovernmental.

Table 4A. Universal salt iodization – salt production

Country/region	Year salt iodization started	Produces and iodizes national salt	Imports iodized salt	Imports uniodized salt and iodizes in country	Type of salt iodized		
					Human use (a)	Food industry use (b)	(a) + (b) + animal use
Balkan countries							
Albania	1996	N	Y	N	Y	N	N
Bosnia and Herzegovina	1935	Y	Y	N	Y	N	Y (animal)
Croatia	1953	Y	Y	Y	N	N	Y
Slovenia	1964	Y	Y	Y	N	N	Y
The Former Yugoslav Republic of Macedonia	1956	N	Y	Y	Y	Y	N
Baltic countries							
Estonia	NA	N	Y	N	NA	NA	NA
Latvia	NA	NA	NA	NA	NA	NA	NA
Lithuania	1995–1996	N	Y	N	Y	N	N
CAR and Turkey							
Turkey	1968	Y	N	N	Y	N	N
Uzbekistan	1992	Y	Y	N	Y	N	N
CEE							
Bulgaria	1958	Y	Y	N	Y	Y	N
Czech Republic	1950	N	Y	Y	Y	Y	Y (45% feed premixes are iodized)
Hungary	1947	N	Y	Y	Y	N	Y (cattle)
Poland	1997	Y	Y	N	Y	N	N
Romania	NA	Y	N	N	Y	N	N
Slovakia	1953	Y	N	N	Y	Y	N
Western Europe							
Austria	1963	Y	N	N	Y	Y (partly)	Y (partly)
Belgium	1990	N	Y	N	Y	Y	Y
France	1952	Y	N	N	Y	N	Y (a+cattle)
Germany	1959	Y	N	N	Y	Y	Y
Ireland	NA	NA	NA	NA	NA	NA	NA
Luxembourg	U	N	Y	N	Y	Y	N
Netherlands	1942	Y	Y	N	Y	Y	N
Switzerland	1922	Y	N	N	N	N	Y
United Kingdom	NA	NA	NA	NA	NA	NA	NA
Southern Europe							
Italy	1972	Y	N	Y	Y	N	N
Portugal	NA	Y	N	N	Y	N	Y
CIS							
Azerbaijan	NA	NA	Y (limited)	NA	NA	NA	NA
Armenia	1997	NA	NA	NA	Y	NA	NA
Belarus	1989	Y	Y	N	Y	N	N
Georgia	NA	N	Y	N	N	N	Y
Republic of Moldova	1994	N	Y	N	Y	N	N
Russian Federation	1956	Y	Y	N	NA	NA	NA
Ukraine	1997	Y	Y	N	Y	N	N
Nordic countries							
Denmark	1998	Y	N	N	Y	Y	N
Finland	1949	N	Y	Y	Y	Y	Y (fodder)
Norway	1920	Y	Y	N	Y	N	N
Sweden	1936	NA	NA	NA	Y	Y (partly)	N

Y = yes , N = no, NA = no answer, U = unknown.

Table 4B. Universal salt iodization – large and small scale salt production

Country/region	Large-scale production			Small-scale production		
	Annual salt production tons/year	Percentage of food grade salt iodized (%)	Estimated population covered by iodized salt (%)	Annual salt production tons/year	Percentage of salt iodized (%)	Estimated population covered by iodized salt (%)
Balkan countries						
Albania	10 000–15 000	0	0	NA	NA	NA
Bosnia and Herzegovina	21 000 (1998)	50	100	NA	NA	NA
Croatia	30 000	100	80	8 000	100	NA
Slovenia	37 000 (approx.)	NA	100	NA	NA	NA
The Former Yugoslav Republic of Macedonia	5000	100	30	NA	NA	NA
Baltic countries						
Estonia	NA	NA	NA	NA	NA	NA
Latvia	NA	NA	NA	NA	NA	NA
Lithuania	U	<5	3	U	<5	NA
CAR and Turkey						
Turkey	400 000	26	18.2	1 450 000	3	NA
Uzbekistan	60 000	15	5	NA	NA	NA
CEE						
Bulgaria	50 000	63	100	NA	NA	NA
Czech Republic	50 000–60 000	65	NA	NA	NA	NA
Hungary	23 600	25	25	NA	NA	NA
Poland	3 979 000 (1997)	<5	100	NA	NA	NA
Romania	NA	NA	NA	NA	NA	NA
Slovakia	NA	100	100	NA	NA	NA
Western Europe						
Austria	40 000	58	100	NA	NA	NA
Belgium	50 000 imported	5	10–20	N	N	N
France	3 300 000 (1997)	46	ND	18 000	0	0
Germany	408 000 (1996)	39	100	NA	NA	NA
Ireland	NA	NA	NA	NA	NA	NA
Luxembourg	NA	NA	NA	NA	NA	NA
Netherlands	NA	80 (table salt)	NA	NA	NA	NA
Switzerland	46 000	90	100	NA	NA	NA
United Kingdom	NA	NA	NA	NA	NA	NA
Southern Europe						
Italy	150 000	10	4–5	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA
CIS						
Azerbaijan	2 000	NA	NA	500	NA	NA
Armenia	10 000	33	NA	NA	NA	NA
Belarus	27 200	37 (1997)	17 (1997)	180 000	11	37.5 (1997)
Georgia	NA	NA	NA	NA	NA	NA
Republic of Moldova	NA	60	50	N	NA	NA
Russian Federation	1 067 000	8[a]	>20[a]	N	N	N
Ukraine	171 000	34.5	44.3	3 100	100	100
Nordic countries						
Denmark	U	U	U	U	U	U
Finland	U	20–25	100	NA	NA	NA
Norway	21 500	10	100	393	100	100
Sweden	NA	NA	100	NA	NA	NA

N = no, NA = no answer, U = unknown, ND = no data.
[a]Only food grade salt.

Table 4C. Universal salt iodization – iodine compound used and its level

Country/region	Iodine compound used			Salt iodine level (mg iodine per kg salt (parts per million))		
	KI	NaI	KIO_3	KI	NaI	KIO_3
Balkan countries						
Albania	Y	N	N	25	–	–
Bosnia and Herzegovina	Y	N	N	5–15	–	–
Croatia	Y	N	Y	25±5	–	25±5
Slovenia	Y	N	N	10±5	–	–
The Former Yugoslav Republic of Macedonia	N	N	Y	–	–	20–30 (1998)
Baltic countries						
Estonia	NA	NA	NA	NA	NA	NA
Latvia	NA	NA	NA	NA	NA	NA
Lithuania	Y	N	Y	10–40	–	10–40
CAR and Turkey						
Turkey	Y	N	Y	50–70	–	25–40
Uzbekistan	N	N	Y	–	–	18
CEE						
Bulgaria	N	N	Y	–	–	20
Czech Republic	Y (10%)	N	Y (90%)	20–34	–	20–34
Hungary	Y	N	Y	15±5	–	15±5
Poland	Y	N	Y	15–30	–	15–30
Romania	N	N	Y	–	–	40–50
Slovakia	Y	N	N	25	–	–
Western Europe						
Austria	Y	N	N	20	–	–
Belgium	Y	Y	Y	6–45	6–45	6–45
France	N	Y	N	–	10–15	–
Germany	N	Y	Y	–	15–25	15–25
Ireland	NA	NA	NA	NA	NA	NA
Luxembourg	N	Y	Y	–	10–15	15–25
Netherlands	Y	Y	Y	30–40 (table salt)	30–40 (table salt)	30–40 (table salt)
Switzerland	Y	N	N	20	–	–
United Kingdom	NA	NA	NA	NA	NA	NA
Southern Europe						
Italy	Y	N	Y	30	–	30
Portugal	N	N	Y	–	–	27
CIS						
Azerbaijan	NA	NA	NA	NA	NA	NA
Armenia	NA	NA	Y	–	–	35±10
Belarus	N	N	Y	–	–	40±10
Georgia	N	N	Y	–	–	40±5
Republic of Moldova	Y	N	N	25–35	–	–
Russian Federation	Y	N	Y	40	–	40
Ukraine	Y	N	Y	24	–	24
Nordic countries						
Denmark	Y	Y	Y	8	8	8
Finland	Y	N	N	20–30	–	–
Norway	Y	N	N	5	–	–
Sweden	Y	Y	N	50	50	–

Y = yes, N = no, NA = no answer.

Table 4D. Universal salt iodization – availability, cost and price

Country/region	Price compared with iodized salt		Availability of iodized salt		Degree of salt for human consumption		Degree of salt for animal consumption		Population at risk of IDD covered by iodized salt (%)	Funding of salt iodization	Annual expenditure (also by weight)
	Same	Higher	Easily available	Certain shops	Country-wide	Sub-country-wide	Country-wide	Sub-country-wide			
Balkan countries											
Albania	–	Y	Y (urban areas)	Y (rural areas)	Y	_	U	U	U	All salt is imported	3.4 tons in 1998
Bosnia and Herzegovina	Y	_	Y	_	Y	_	Y	_	NA	Producer	50 DM/100 tons
Croatia	Y	–	Y	–	Y	–	Y	–	NA	Consumer	NA
Slovenia	Y	_	Y	_	Y	_	Y	_	NA	Producer/ Importer	NA
The Former Yugoslav Republic of Macedonia	_	Y	Y	_	Y	_	Y	_	18.7 with goitre	Consumer	NA
Baltic countries											
Estonia	–	Y	–	Y	NA	NA	NA	NA	NA	NA	NA
Latvia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lithuania	–	Y	Y	–	Y	–	–	Y	30–40	Consumer	U
CAR and Turkey											
Turkey	Y	_	Y	_	Y	_	NA	NA	NA	Salt companies	NA
Uzbekistan	–	Y	Y	–	N	N	N	N	5	UNICEF	NA
CEE											
Bulgaria	Y	–	Y	–	Y	–	N	N	100	Consumer	NA
Czech Republic	–	Y	Y	–	Y	–	Y	–	70–80	Producer	3 500 000 Kc
Hungary	–	Y	Y	–	Y	–	–	Y	U	Consumer	NA
Poland	U	U	Y	–	Y	–	NA	NA	100	Consumer	NA
Romania	–	Y	Y	_	Y	_	NA	NA	_	Producer	US $160 000 /year
Slovakia	NA	NA	Y	_	Y	_	–	Y	0	State, salt industry	NA
Western Europe											
Austria	Y	–	Y	–	Y	–	–	Y	100	Consumer	Neg.
Belgium	–	Y	–	Y	Y but no regional figures available	–	Y but no regional figures available	–	10–20	Consumer	?
France	–	Y	Y	–	Y	–	Y	–	ND	Consumer	U
Germany	–	Y	Y	_	Y	_	Y	_	66	Consumer	0.15 DM/ person/ year
Ireland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	–	Y	Y	–	Y	–	Y	–	U	Consumer	U
Netherlands	Y	–	Y	–	Y	–	NA	NA	±95	Consumer	NA
Switzerland	Y	–	Y	–	Y	–	Y	–	100	Producer	US $600 000
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Country/region	Price compared with iodized salt		Availability of iodized salt		Degree of salt for human consumption		Degree of salt for animal consumption		Population at risk of IDD covered by iodized salt (%)	Funding of salt iodization	Annual expenditure (also by weight)
	Same	Higher	Easily avail-able	Certain shops	Country-wide	Sub-country-wide	Country-wide	Sub-country-wide			
Southern Europe											
Italy	–	Y	Y	–	Y	–	NA	NA	4–5	Consumer	NA
Portugal	–	Y	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS											
Azerbaijan	Y	–	–	Y	Y (limited)	–	NA	NA	NA	NA	NA
Armenia	–	Y	Y	–	Y	–	N	NA	NA	UNICEF	US $15 000 – 20 000
Belarus	_	Y	Y	_	Y	_	N	N	54.5 (1997)	Trade establish-ments	396 min BRB/year
Georgia	–	Y	Y	–	Y	–	Y	–	NA	NA	NA
Republic of Moldova	_	Y	Y	–	Y	–	U	U	100	Consumer	US $0.04 /person/year
Russian Federation	–	Y	–	Y	–	Y	NA	NA	NA	Consumer	NA
Ukraine	Y	–	Y	–	NA	NA	NA	NA	35	UNICEF	NA
Nordic countries											
Denmark	–	Y	Y	–	Y	–	NA	NA	U	Consumer	NA
Finland	Y	–	Y	–	Y	–	Y	–	0	Consumer	4FIM/Kg
Norway	Y	–	Y	–	Y	–	Y	NA	100	Producer	NA
Sweden	Y	–	Y	–	Y	–	NA	NA	NA	Consumer	NA

Y = yes , N = no, NA = no answer, U = unknown, ND = no data, Neg. = negligible.

Table 4E. Universal salt iodization – legislation

Country/region	Law or decree governing use of iodized salt	Date of implementation /law passed	Brief description
Balkan countries			
Albania	Y	1997	All imported salt to be iodized in accordance with WHO/UNICEF-recommended norms
Bosnia and Herzegovina	NA	1958	NA
Croatia	Y	1997	Obligatory fortification of all salt intended for human and animal use with 25±5 mg of KI per kg of salt
Slovenia	Y	1963	Legislation on quality of cooking salt
The Former Yugoslav Republic of Macedonia	Y	1956	All salt should be iodized with KIO_3 at 20–30 mg of iodine/kg
Baltic countries			
Estonia	N	–	–
Latvia	N	–	–
Lithuania	In planning	–	–
CAR and Turkey			
Turkey	Y	1968	Compulsory iodization of table salt with 50–79 mg KI /kg or 25–40 mg KIO_3/kg
Uzbekistan	N	–	–
CEE			
Bulgaria	Y	1994	Obligatory use of iodized table salt, prohibition of sale of non-iodized salt
Czech Republic	Y	1997	Content of iodine in salt in range of 20–34 mg/kg
Hungary	Y	1997	Obligatory iodization of household salt at 15 mg/kg iodine level with KIO_3
Poland	Y	1996	Salt for human consumption must contain 30±10 mg/kg KI
Romania	Y	1995	Salt producers must produce iodized salt and all food shops must sell iodized salt
Slovakia	Y	1960	NA
Western Europe			
Austria	Y	1963	Food grade salt has to be supplemented with 20 mg Kaliumiodid and labelled Vollsalz
Belgium	Y	1990	Any iodine compound is authorized; level of iodization authorized: from 6 to 45 ppm
France	Y	1952	Authorization to supplement exclusively human and household salt
Germany	Y	1981	Fortification of food grade salt with only potassium or sodium iodate and maximum level not to exceed 25 mg/kg salt
Ireland	NA	NA	NA
Luxembourg	N	–	–
Netherlands	Y	1996	Allowed to add iodide to bread (60–80 mg) meat products (20–30 mg) and table salt (30–40 mg) as KI, NaI, KIO_3 or $NaIO_3$
Switzerland	Y	1995	Iodine may be added to salt at 20–30 ppm
United Kingdom	NA	NA	NA
Southern Europe			
Italy	Y	1995	Voluntary use of iodized salt, increased content of iodine from 15 to 30 mg/Kg
Portugal	Y	1996	Liberalizes sale of iodized salt and establishes limits on iodine content
CIS			
Armenia	N	–	–
Azerbaijan	NA	NA	NA
Belarus	Y	1997	Iodized salt should be provided to all shops, canteens, institutions, etc. Conditions for production, transportation and storage of iodized salt are controlled
Georgia	Y	1996	Universal salt iodization
Republic of Moldova	Y	1998	Import and consumption of iodized salt
Russian Federation	N	–	–
Ukraine	Y	NA	Law on prevention of IDD
Nordic countries			
Denmark	N	1998	General permission to fortify salt given in 1998
Finland	N	–	–
Norway	Y	1983	General regulation permits iodization of salt
Sweden	Y	1966	General permission to iodize salt with KI or NaI

Y = yes, N = no, NA = no answer.

Table 5. Surveillance – (A) Population monitoring

Country/region	IDD monitoring system built into action plan	Monitoring system to measure iodine status of population	Period of surveys	Population surveyed	Survey size 1. national 2. sub-national	Total goitre rate (%)	Urinary iodine (µg/L unless otherwise stated)	Other: TSH, ultrasound
Balkan countries								
Albania	Y	Y	1993–1994	SC	1, 2	28.4	NA	–
Bosnia and Herzegovina	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	Y	Y	1997	SC (7–11 yr)	1	18.5 (mean)	NA	NA
Slovenia	Y	Y	1996	SC	1	11	83	Y
The Former Yugoslav Republic of Macedonia	Y	Y	1995–1996	SC	1	18.7	117 (median) 132 (mean)	Y
Baltic countries								
Estonia	N	N	1995	1840 SC	1	55	65 (median) 83 (mean)	NA
Latvia	N	N	NA	NA	NA	NA	NA	NA
Lithuania	Y	Y	1994–1995	SC	2	26–38	55–75	Y
CAR and Turkey								
Turkey	Y	Y	1997	4–24 years	2 villages at risk	92	0.5–1 mg/dl	NA
Uzbekistan	Y	Y	1998	All ages	1	35–40	<10 mg/l	NA
CEE								
Bulgaria	Y	Y	1996	≈8 000 SC	1	28.6	111.38 (median)	NA
Czech Republic	Y	Y	1997	Neonates	1	NA	100	NA
Hungary	Y	Y	1996–1997	100 000 SC	2	4.5	20–250	NA
Poland	Y	Y	1992–1993	SC	1	4.4–36.6	< 100	USG
Romania	Y	Y	1995–1996	200 SC	NA	12.8	18.8 µg/dl (median)	NA
Slovakia	NA	Y	1996	Children, adolescents	1	NA	144	Y
Western Europe								
Austria	N	Y	1991–1995	Adults	1, 2	15–30	120–140	NA
Belgium	N	N	1994–1995	SC	2,1	8–11; 6	55, 80	Ultrasound
France	N	N	1996	Adults	1	NA	74–98	Y
Germany	Y	Y	1996	>14 years	1	NA	NA	NA
Ireland	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	N	In planning	NA	NA	NA	NA	NA	NA
Netherlands	N	N	NA	NA	NA	NA	NA	NA
Switzerland	N	N	1998	SC	2	NA	113	NA
United Kingdom	NA	Y	NA	NA	NA	NA	NA	NA
Southern Europe								
Italy	N	N	1991–1997	SC SC	2 2	14–69, 4–18	10–122 50–175	NA NA
Portugal	N	N	NA	NA	NA	NA	NA	NA
CIS								
Azerbaijan	NA	N	NA	NA	NA	NA	NA	NA
Armenia	Y	Y	NA	NA	NA	NA	NA	NA
Belarus	NA	NA	NA	NA	NA	NA	NA	NA
Georgia	Y	Y	1998	40 000 SC	2	NA	≈52	Y
Republic of Moldova	Y	Y	1996	3 313 SC	1	36.7	7.84	NA
Russian Federation	N	N	1991	SC	2	10–40	15–80	TSH
Ukraine	N	N	NA	NA	NA	NA	NA	NA
Nordic countries								
Denmark	Y	Y	1997–1998	Men, women	1	Not available	Not available	Not available
Finland	N	Y	1981	Adults	2	NA	Men 273 Women 203	NA
Norway	N	N	NA	NA	NA	< 1	75–125	NA
Sweden	N	N	NA	Pregnant women	2	NA	1.4–1.14 µmol/l (week 11–38)	TSH & FT4

Y = yes, N = no, NA = no answer, SC = schoolchildren, U = unknown.

Table 5. Surveillance – (B) Programme monitoring

Country/region	System to monitor process indicators	Monitoring indicators			Salt quality control		Methods used		
		Proportion of salt iodized (%)	Household consumption of iodized salt	Others	System to monitor quality of iodized salt	Monitoring body	Field Kits	Titration methods	Laboratory facilities
Balkan countries									
Albania	Y	85 (in market)	U	NA	Y	Ministry of Health	Y	Monthly	Food chemistry laboratory
Bosnia and Herzegovina	NA	100	100	N	NA	Ministry of Health	NA	NA	NA
Croatia	Y	100	100	NA	Y	Ministry of Health	NA	Perma-nent monitoring	Y
Slovenia	NA	NA	NA	NA	Y	Ministries of Health, Commerce	NA	NA	Y
The Former Yugoslav Republic of Macedonia	Y	100	100	Urinary iodine	Y	Ministry of Health	NA	Y	Y
Baltic countries									
Estonia	N	NA	NA	NA	Y	Ministry of Social Affairs, Health Protection Inspectors	NA	NA	NA
Latvia	N	NA	NA	NA	N	NA	NA	NA	NA
Lithuania	N	NA	NA	NA	Y	Ministry of Health	NA	Y	Y
CAR and Turkey									
Turkey	Y	26	18.2	NA	NA	NA	NA	NA	NA
Uzbekistan	Y	15	5	NA	Y	Institute of Endocrinology	Y	Y	Y
CEE									
Bulgaria	Y	63	100	NA	Y	Ministry of Health	NA	Every 3 months	NA
Czech Republic	N	65	100	Y	Y	Ministry of Agriculture	NA	Volumetric methods	Polarograph
Hungary	Y	25	U	Consump-tion of pills	Y	Ministries of Health, Industry	NA	Y	Traditional facilities
Poland	Y	≈60	≈100	NA	Y	Ministry of Health and Social Welfare	NA	2–3 times a year	NA
Romania	Y	47.5	64	NA	Y	Food hygiene programme	NA	NA	NA
Slovakia	NA	NA	NA	NA	Y	Ministry of Health, regional hygiene stations	NA	NA	NA
Western Europe									
Austria	N	NA	NA	NA	N	NA	NA	NA	NA
Belgium	N	NA	NA	NA	Y	Producers	NA	Y	All
France	N	NA	NA	NA	Y	Ministry of Economy	NA	Bi-monthly	Y

Country/region	System to monitor process indicators	Monitoring indicators			Salt quality control		Methods used		
		Proportion of salt iodized (%)	Household consumption of iodized salt	Others	System to monitor quality of iodized salt	Monitoring body	Field Kits	Titration methods	Laboratory facilities
Germany	Y	39	70	NA	Y	Industry and food inspection services	Y	Y	NA
Ireland	NA	NA	NA	NA	NA	NA	NA	NA	NA
Luxembourg	N	NA	NA	NA	N	NA	NA	NA	NA
Netherlands	N	NA	NA	NA	Y	Ministries of Health, Industry	NA	NA	NA
Switzerland	Y	90	94	NA	Y	Food control laboratories	NA	NA	NA
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA	NA
Southern Europe									
Italy	N	NA	NA	NA	Y	Public health system	NA	NA	NA
Portugal	N	NA	NA	NA	NA	NA	NA	NA	NA
CIS									
Azerbaijan	N	NA	NA	NA	N	NA	NA	NA	NA
Armenia	NA	NA	NA	NA	NA	NA	Y (monthly)	Y on selective basis	Laboratory scales, cone flasks, pipette gauge
Belarus	NA	NA	NA	NA	NA	NA	NA	NA	NA
Georgia	N	NA	NA	NA	Y	Ministry of Health	Y	Y	Specialized
Republic of Moldova	Y	≈50	U	NA	Y	Ministry of Health	NA	100	Y
Russian Federation	Y	NA	NA	NA	Y	Ministry of Health, Standard Committee	N	Y	Laboratories at production sites and in sanitary epidemiologi-cal control centres
Ukraine	N	NA	NA	NA	N	NA	NA	NA	NA
Nordic countries									
Denmark	N	NA	NA	NA	In planning	Ministry of Food, Agriculture and Fisheries	NA	NA	NA
Finland	N	NA	NA	NA	Y	Ministry of Commerce	NA	Y	Y
Norway	N	NA	NA	NA	N	NA	NA	NA	NA
Sweden	N	NA	NA	NA	NA	NA	NA	NA	NA

Y = yes, N = no, NA = no answer, U = unknown.

Table 6. General overview: progress on elimination of IDD in 38 Member States of the WHO European Region, 1999

	Questions	Yes	No	No answer	In planning
1.	*IDD prevalence*				
	Data on IDD prevalence?	30	5	1	U=2
	Action plan?	20	9	1	8
	National coordinating committee for IDD control?	19	12	1	6
2.	*Universal salt iodization (USI)*				
	Produce and iodize salt	21	11	6	–
	Import already iodized salt	23	10	5	–
	Import uniodized salt and iodize it	7	25	6	–
3.	*Type of salt iodized*				
	For human use (a)	28	4	6	–
	For food industry (b)	12	19	7	–
	(a) + (b) + cattle	13	18	7	–
4.	*Iodine compound used*				
	KI	22	10	6	–
	NaI	7	25	6	–
	KIO_3	21	12	5	–
5.	*Cost of iodized salt*				
	Higher	20	13	4	U=1
6.	*Availability*				
	Easily available	30	4	4	–
	In certain shops	5	29	4	–
7.	*Degree of salt for human consumption*				
	Countrywide	30	2	6	–
8.	*Degree of salt for animal consumption*				
	Countrywide	13	8	15	U=2
9.	*Legislation*				
	Is there legislation?	25	8	4	1
10.	*Monitoring system for IDD*				
	Monitoring system to measure iodine status of population?	21	13	3	1

U = unknown.

Discussion

IDD pose a serious threat to public health throughout the WHO European Region. Effective and sustained elimination of IDD depends on the priorities that governments place on establishing IDD control programmes and enforcing tough legislation and successful universal salt iodization.

1. Data on the prevalence of IDD in WHO Member States

Are there data on the prevalence of IDD?	Yes: 30	No: 5	Unknown: 2	No answer: 1

The prevalence rates of goitre, and hence IDD, in the WHO European Member States is approximately equivalent to the worldwide prevalence rates, thereby suggesting higher IDD rates for European subregions (2). The actual prevalence of IDD is difficult to establish because several countries lack information about their IDD situation.

Out of the 38 reporting Member States, 30 (79%) countries are reported to have data on the prevalence of IDD (Table 2). Finland, Ireland, Norway, Slovakia and the United Kingdom reported no prevalence of IDD, while Estonia and Latvia have not diagnosed their IDD problem. Sweden did not respond to the question but IDD seems to have been eliminated there. Quantified information on prevalence was not requested in the questionnaire. A summary of prevalence of IDD in Member States is given in Annex 2.

There is ample evidence from the literature that Iceland has never had an IDD problem.

Since 1950, Norway has by law been fortifying cattle fodder with 0.5 mg iodine per kg. This gives a high content of iodine in cows' milk, milk products and meats, which are the main source of iodine in the Norwegian diet, and has led to elimination of IDD in Norway.

Some 79% of the countries with data on the prevalence of IDD have assessed the magnitude of the problem. Bosnia and Herzegovina has not done so, even though it reports the prevalence of IDD. Denmark and France are assessing the magnitude of the prevalence of IDD but no data are available yet.

Is there an action plan for IDD?	Yes: 20	No: 9	In planning: 8	No answer: 1

Countries with IDD need to develop an action plan to eliminate IDD effectively. Twenty Member States (53%) have action plans for IDD. Armenia, Azerbaijan, Belgium, Italy, Luxembourg, Slovakia and Ukraine are working on action plans for IDD. Belarus is also planning to develop an action plan but currently has a state project (1998–2003) on elimination of iodine deficiency.

Is there a national coordinating committee for IDD control?	Yes: 19	No: 12	In planning: 6	No answer: 1

In 19 (50%) of the 38 reporting Member States a national coordinating committee for IDD control has been established (Table 3). Armenia, Azerbaijan, Belarus, Luxembourg, Slovakia and Uzbekistan are planning to form national coordinating committees for IDD control.

In Albania, the current IDD National Coordinating Committee is under the Ministry of Health but in 1999 they plan to re-establish it with members from the Ministries of Health, Agriculture, Education, and Economics and Privatization, the media, NGOs, etc. The chairperson will still come from the Ministry of Health.

The composition of the committees in various countries varies as follows.

Belgium:	Ministries of Health, Industry, Commerce, academic physicians
Bulgaria:	Ministries of Industry, Trade, Finance, Medical University
Croatia:	Croatia National Institute of Public health, representatives of salt producers and of the Veterinary Faculty
Czech Republic:	Food industry, pharmaceutical firms, importers
Denmark:	Health professionals
Finland:	Food, research, production, consumers
Georgia:	Ministries of Justice, Trade, Economy, Finance, Department of Standardization
Germany:	Scientists
Hungary:	Trade and industry
Italy:	Academic physicians: thyroidologists
Poland:	Medical experts, scientific research institutes, industry and zoo technical experts
Republic of Moldova:	Ministry of Trade, UNICEF
Ukraine:	Ministry of Science and Technology, Ministry of Family and Youth

2. Iodine supplementation (iodized oil)

Only Albania, Azerbaijan, Georgia and the Russian Federation out of the 38 Member States responded to the question on iodine supplementation in oil.

In Georgia, the programme started in 1998. It covers about 10% of the population and is still in progress.

In Albania, oil capsule distribution started in February 1996 for a period of four months and covers 15% of the target population. Lactating mothers and children aged 6–15 years in the north of the country were given oil capsules.

In Azerbaijan, iodine supplementation with an oil programme started in 1998 and is planned to continue until 2002, covering 12 districts**.**

In the Russian Federation, the programme ran from 1992 to 1993 and covered children in the Chernobyl area.

3. Universal salt iodization

The adopted public heath strategy for elimination of IDD is universal salt iodization (USI), which implies that all salt used by the agriculture and food processing industries, the mass catering sector and households is iodized. Current WHO recommendations suggest that salt at the point of production should contain 20–40 mg of iodine (or 34–66 mg potassium iodate) per kg of salt in order to provide 150 µg/day of iodine. However, to make this calculation, various assumptions have to be made and it is therefore assumed that the average intake of salt per person per day is 10 g. In some countries, average salt consumption may be considerably higher than 10 g/day, which exceeds the WHO recommended upper limit of 6 g salt/day (12). Moreover, in the CCEE and NIS, the tradition of preserving vegetables and meat in salt means that the intake of salt could be much higher than 10 g and so the level of salt consumption should be carefully estimated.

Although conclusive epidemiological and experimental data are still not available, it is clear that human populations with a higher incidence of hypertension would benefit if they lowered their blood pressure by reducing their daily intake of salt. High blood pressure is the most important risk factor for stroke, and modest blood pressure reduction in hypertensive people could reduce stroke incidents by half. Some studies suggest that there could be a 23% reduction of mortality from stroke by the age of 55 years if the daily intake of salt were reduced (12).

Countries with endemic iodine deficiency have tended to solve the problem by the compulsory iodization of staple foodstuffs, for example milk and bread. A study in Britain (13) concluded that IDD can be eliminated by ensuring that dairy herds are iodine-replete, thus the iodine in milk and dairy products increases human iodine intakes. In fact, both Finland and Norway have eliminated iodine deficiency by iodizing cattle fodder and Poland is now considering this approach.

In 1997, Italy implemented a health education campaign called “Salt in food for the prevention of iodine deficiency and hypertension”. In the context of health education, the Department of Food, Nutrition and Veterinary Public Health of the Ministry of Health promoted the implementation of a specific campaign to address both IDD and hypertension. In Italy, IDD represents a public health problem since more than 10% of the population (about 5 million people) suffer from thyroid disorders.

Considering the social importance of IDD, the campaign in Italy aimed to eradicate IDD and simultaneously reduce the mean intake of salt to less than 6 g per day to prevent hypertension. The campaign was implemented through regional meetings organized by the Ministry and regional health services and an internet site was created (www.gol-it.com/sale).

4. Initiation of universal salt iodization

Norway and Switzerland were the first countries to initiate the iodization of salt in the early 1920s, followed by other Member States. Countries that have recently adopted salt iodization programmes include Austria (1991), the Republic of Moldova (1994), Lithuania (1995), Albania (1996), Poland (1997), Armenia (1997) and Denmark (1998) (Table 4A).

Universal obligatory iodization of salt for direct human consumption was introduced in 1997. Poland introduced it as early as 1935, but only in the specific region most seriously affected by IDD and with a low iodine level in the salt. This limited form of iodization was continued until

the Second World War, and was then started up again during the 1950s until the beginning of the 1980s.

A total of 21 Member States (55%) produce their own iodized salt whereas 23 (61%) import iodized salt. Seven (18%) reported that they imported uniodized salt and iodized it in their countries. Belarus imports salt from Ukraine.

The iodized salt in various countries is intended for human, food industry and/or animal use (Table 4A). In Finland, Norway and the United Kingdom, all salt is iodized and cattle are fed iodized fodder. Endemic goitre has disappeared and iodine intakes in the United Kingdom have risen progressively during the last half century. The most reasonable explanation seems to be that changes in farming practice which led to iodine contamination of milk and dairy produce together with the policy of encouraging milk consumption led to eradication of IDD.

The Czech Republic reported that 45% of cattle salt used in premixes added to fodder is iodized.

5. Annual salt production (large- and small-scale)

Annual salt production (large- and small-scale) in various Member States is illustrated in Table 4B. Austria, Bulgaria, Croatia, Czech Republic, the Netherlands, Poland, Slovakia, Switzerland and The Former Yugoslav Republic of Macedonia reported that more than 50% of their iodized salt comes from large-scale production. Denmark has no data on salt production and iodization, as iodization only started in 1998.

Albania had its own salt-producing company, but after the pyramid scheme collapsed in 1997 this company was closed. Although Estonia has no information on IDD prevalence, iodized salt is imported and is available in certain shops at higher prices.

In Azerbaijan, in addition to 2000 tons of salt produced annually on a large scale, 9500 tons of salt are produced from 100 000 tons of salt solution from a salt lake. Salt is also imported from Iran, the Russian Federation, Turkey and Ukraine into Azerbaijan.

Most countries did not answer the question about small-scale production.

6. Iodine compounds and concentrations used for salt iodization

Which iodine compounds are used?	KI: 22	NaI: 7	KIO_3: 21

The standard WHO/UNICEF/ICCIDD recommendation is to use potassium iodate (KIO_3) because of its greater stability and longer shelf life. Many countries use potassium iodide (KI), which is slightly less expensive, but all countries are urged to change to KIO_3. This means that iodine producers should make the necessary changes to adapt their production processes. KIO_3 is currently used for salt iodization only in Belarus, Bulgaria, Portugal, Romania, The Former Yugoslav Republic of Macedonia and Uzbekistan. However, as shown in Table 5C, 22 countries iodize salt with KI and 7 countries with NaI (Sodium iodide). Belgium, Croatia, the Czech

Republic, Denmark, Germany, Hungary, Lithuania, Luxembourg, the Netherlands, Turkey and Ukraine use KIO_3 in addition to KI or NaI to iodize salt.

In 1991, Austria increased the salt iodine level from 10 mg to 20 mg iodine per kg of salt.

Salt iodine levels are shown in Table 4C. The levels range from 5 to 40±10 mg iodine per kg salt (parts per million).

In Poland, iodine is added in the form of KI. However, in 1998 the General Sanitary Inspector gave permission for the importation of salt containing KIO_3 at the level of 15–30 mg iodine per 1 kg of salt.

7. Availability and comparison of prices of iodized salt

What is the availability of iodized salt?	Easily available: 30	Only in certain shops: 5	No answer: 4

As shown in Table 4D, most Member States (30) reported that iodized salt was easily available.

In Albania, iodized salt is easily available in urban areas but in rural areas it is only available in certain shops. Albania reported that according to data from NGOs, about 85% of the salt available on the market in Albania is iodized.

The degree of salt consumption varied between different countries: 26 reported that salt for human consumption was available countrywide, while only 10 reported that iodized salt for animal use was available countrywide. The population at risk of IDD receiving iodized salt varied from 18.7% in The Former Yugoslav Republic of Macedonia to 100% in Austria, Bulgaria, Norway and Poland.

Is the price of iodized the same or higher than that of uniodized salt?	Same: 13	Higher: 20	Unknown: 1	No answer: 4

Twenty countries reported that iodized salt cost more than uniodized salt, and 13 reported the price to be about the same (Table 4D). Poland gave no information on salt prices.

8. Legislation on implementation of universal salt iodization

Is there a law or decree governing the use of iodized salt?	Yes: 25	No: 8	In planning: 1	No answer: 4

Legislation is an important component of an IDD control programme. However, only in some countries is iodization of salt regulated by law(s) adopted by the parliament. Of the 38 reporting Member States, 25 have taken action to implement legislation for salt iodization.

A brief description of the laws/decrees for the Member States is given in Table 4E.

Lithuania is reported to be planning legislation on salt iodization. In Denmark, there is no legislation on salt iodization, but in 1998 general permission was given to fortify salt with iodine.

In countries such as Albania, Bulgaria, Croatia, Hungary, Romania, The Former Yugoslav Republic of Macedonia and Turkey, the legislation adopted generally calls for all salt for human use to be iodized. Legislation should also state that all salt for animal consumption should be iodized. If only salt for human consumption is iodized and aggressively promoted it may lead to an increased intake of salt by the population. An example is the Republic of Moldova, which legislates for the import and consumption of iodized salt. There needs to be a reform in legislation in all countries adopting USI for both humans and animals to eliminate IDD, as in Finland and Norway.

9. Other methods to control IDD (e.g. water iodization)

Only the Czech Republic, Hungary and Ukraine answered the question on other methods used to control IDD.

In Hungary, in 1955, 2% of the target group (which included pregnant women and children) were given natural spring water containing 100 mg of iodine called “iodaqua”, and about 2–5% of the target group comprising pregnant women and children were given KI pills with 50 µg of iodine per pill.

Sources of iodine (12)

The iodide content of plants and animals is determined by the environment in which they grow. As most soils contain little iodide, most foodstuffs are poor sources. Fruits, vegetables, cereals, meat and meat products usually contain 20–50 µg/kg. The only rich source of iodide is sea food: if sea food is eaten at one or two meals per week this may provide a minimum intake of around 150 µg/day.

In the United Kingdom and most Nordic countries, milk and milk products are the main source of iodine because cattle fodder is iodinated by law. There are seasonal variations: around 45% of total iodine intake in summer and 70% in winter originates from milk. All the Nordic countries, including Denmark, fortify their salt to varying degrees. However, intervention strategies such as these require regular monitoring as and when eating patterns change and new prevention strategies may be needed.

10. Surveillance

A. Population monitoring

Crucial aspects of a successful salt iodization programme are monitoring and evaluation. These are closely tied to enforcement of legislation, since it is only through monitoring that compliance with legislation can be determined.

Is there a monitoring system to measure the prevalence of IDD?	Yes: 21	No: 13	In planning: 1	No answer: 3

Most countries of the Region need to develop an effective IDD monitoring system. Effective control programmes fail without proper monitoring, feedback control and management. Some 21 Member States (55%) said that they had a monitoring system to measure the prevalence of IDD in the population (Table 5A). Luxembourg is planning to develop a population monitoring system. In Poland, the monitoring body comprises the Ministry of Health, National Food and Nutrition Institute and Institute of Hygiene.

No data are available yet for Denmark, although studies were conducted in 1997–1998 on men and women. In Finland, research is being done on goitre, nutrition and food composition.

B. Programme monitoring

Is there a system to monitor process indicators?	Yes: 13	No: 17	In planning: 1	No answer: 7

Thirteen of the 38 reporting Member States have a system to monitor process indicators (Table 5B). In Croatia, the monitoring project covers salt samples (iodine levels) from households, retailers (shops), salt producers and imported salt. Investigations are conducted by the sanitary inspectors and the Institute of Public Health (under the Ministry of Health).

In Albania, field kits are used to assess the iodine content in salt if they are provided by UNICEF. A few studies are being carried out by some universities in Turkey on iodine content in salt and the IDD situation.

11. Side effects of excess iodine or excess salt intake

Only Germany has reported hyperthyroidism as a side effect of salt iodization in older people with dysfunction of the thyroid gland.

Campaigns to promote the intake of iodized salt must guard against recommending an increased intake of household salt. A study in Mongolia (14) demonstrated that an education campaign in endemic areas aimed at achieving voluntary consumption of iodized household salt was effective. Unfortunately the campaign was accompanied by an increase in total salt consumption by 58% of families because they thought more salt would be good for them. The higher the sodium intake, the higher the prevalence of essential hypertension in the population, with an associated increase in morbidity and mortality from cardiovascular diseases. One way around this is to use strategies such as those adopted by Italy (see section 3 above), or alternatively legislation requiring the iodization of all salt for animal and/or human consumption. The latter obviates the need to promote salt consumption.

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Annex 1

QUESTIONNAIRE
ASSESSING PROGRESS ON ELIMINATING IDD

GENERAL INFORMATION

a. Country situation

- Is there an IDD problem in your country? *Yes* *No* *Unknown*
- Has the magnitude of IDD been assessed? *Yes* *No*
- At what level was it assessed? *National* *Sub-national*

b. Institutional support

- Is there a national coordinating committee or similar body for IDD control? *Yes* *No* *In planning*
- When was it established? *19..... /.....*
- What is its composition? (e.g. Ministry of Health, Agriculture, Education, other)
  .....
  .....
- From which ministry does the Chairperson come?.....

c. Plan of action

- Is there a national plan of action for IDD or for micronutrients which includes iodine? *Yes* *No* *In planning*
- If yes, what year was it adopted? *19..... /.....*
- Has it been revised? *Yes* *No* *When? .....*

INTERVENTION STRATEGIES

Iodine supplementation (iodized oil)

Year started	Year ended (if applicable)	Percentage of population covered	Target group	Remarks on implementation

Universal salt iodization

A. Salt production

- Which year did salt iodization begin? *19 ...../ .....*
- Does your country: a) produce and iodize its own salt in the country? ☐
  b) import already iodized salt? ☐
  c) import uniodized salt and then iodize it in-country? ☐

- Large-scale production

  a) How much salt is produced annually? ..... *tons/year*
  b) What percentage of the total amount of salt produced is iodized? ..... *%*
  c) What is the estimated proportion of the population covered with *iodized* salt from large-scale production? ..... *%*

- Small-scale production

  a) How much salt is produced annually? ..... *tons/year*
  b) What percentage of the total amount of salt produced is iodized? ..... *%*
  c) What is the estimated population covered by small-scale production? ..... *%*
  d) What is the estimated proportion of the population covered with *iodized* salt from small-scale production? .....*%*

- Which salt is iodized?

  a) salt for human use (i.e. household) ☐
  b) salt for the food industry ☐
  c) salt for the use of humans, the food industry and animals (cattle salt) (USI) ☐

- Which iodine compound is used? *Kl ..... Nal ..... KlO_3 ….....*
- What is the salt iodine level? *…..... mg iodine per kg salt (ppm)*

B. Availability, cost and price

- Is the price of iodized salt compared to non-iodized salt: *the same higher?*
- Is iodized salt: *easily available? only available in certain shops?*
- Is iodized salt used for human consumption *countrywide? sub-countrywide?*
- Is iodized salt used for animal consumption *countrywide? sub-countrywide?*
- What percentage of the population at risk of IDD is covered by iodized salt? .....*%*
- Who pays the cost of iodization? .....
- How much (approximately) does this amount to annually?.....

C. Legislation

- Is there a law or decree governing the use of iodized salt? *Yes No*
- If so, what is it called? .....
- Date the law was passed *19 ..... /.....*
- Summary of the law

  .....
  .....

Other methods to control IDD (e.g. water iodization)

Year started	Year ended (if applicable)	Percentage of population covered	Target group	Remarks on implementation

SURVEILLANCE

- Are systems to monitor and evaluate the IDD control programme built into the plan of action for IDD control: *Yes* *No*

A. Monitoring the population

- Is there a monitoring system to measure the iodine status of the population? *Yes* *No*
- Summarize the results of population-level surveys (if the information is available, this table should show the situation *before* and *after* any IDD interventions in order to show trends and improvements).

Year	Population surveyed (schoolchildren or other)	Survey size 1. national 2. sub-national	Total goitre rate (TGR)	Urinary iodine µg/l	Other[a]
19.../...					
19.../...					

[a] Specify, e.g. TSH, ultrasound.

B. Monitoring the programme

(i) Process monitoring

- Is there a system to monitor the process indicators? *Yes* *No*
- If yes, what indicators were used and what were the results?

  Proportion of of salt iodized *%*
  Household consumption of iodized salt *%*
  Other indicators (*specify)* .....

(ii) Salt quality control

- Is there a system for monitoring the quality of the iodized salt? *Yes* *No*
- Who carries out this monitoring (e.g. Ministry of Health, Ministry of Commerce, other (*specify)*)?

  .....

- What methods are used? a) Field kits: Frequency? .....
  b) Titration methods: Frequency? .....
- What laboratory facilities are available for titration?

  .....
  .....

SIDE FFECTS

- Were any unfavourable or side effects reported after the introduction of iodized salt? *Yes* *No*
- If yes, describe them:

  .....
  .....

- If yes, was any action taken?

  .....
  .....

Annex 2

PRESENT STATUS OF IODINE DEFICIENCY DISORDERS IN EUROPE

IDD virtually eliminated	Marginal and mild	Generally moderate	Severe or critical
Finland	Czech Republic	Armenia	Albania
Iceland	Estonia	Azerbaijan	Tajikistan
Netherlands	Hungary	Belarus	
Norway	Latvia	Bulgaria	
Slovakia	Lithuania	Croatia	
Sweden	Republic of Moldova	Georgia	
Switzerland	The Former Yugoslav Republic of Macedonia	Kazakhstan	
United Kingdom		Kyrgyzstan	
		Poland	
		Romania	
		Russian Federation	
		Turkey	
		Turkmenistan	
		Ukraine	
		Uzbekistan	

Source: (2).

Annex 3

CONTACT PEOPLE AT ICCIDD AND WHO

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