Dossier on USI Achievement in Kazakhstan

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Executive Summary

The Republic of Kazakhstan has achieved the goal of Universal Salt Iodization (USI) thanks to a series of joint collaborative steps pursued by national organizations with the devoted support of international agencies. Evidence from salt tests during a national, population-representative survey in early 2006 showed that 92 percent of the households are using adequately iodized salt. This is a quantum leap as compared to the situation in 1999 when less than one-third of the households in Kazakhstan were using iodized salt. Also, the median urinary iodine concentration in women of reproductive age, found in the National Micronutrient Survey 3 months later in 2006, was 250μg/L as compared to 95μg/L in 1999. Further in-depth data analysis of the National Micronutrient Survey revealed that the use of adequately iodized salt (≥15mg iodine/kg) in the households across Oblasts (Provinces) is closely correlated with the share of urinary iodine concentrations ≥100μg/L in the women living in these households, thus offering an affirmation that the USI strategy practiced in Kazakhstan is the underlying factor that drives the alleviation of iodine deficiency in the population.

The Law "On Prevention of Iodine Deficiency Disorders" enacted on 14 November 2003 bans the sale or trade of non-iodized consumption salt in Kazakhstan, thus making the iodization compulsory of all the food-grade and fodder salt accessible by the population, the food manufacturing industry and the cattle breeders. The principal law also specifies the exclusive use of potassium iodate (KIO_3) as fortificant and lays down the requirements for packaging, labeling and storage of iodized salt. An agreement, signed in May 2001 by the Heads of State of the Commonwealth of Independent States at their meeting in Minsk, Belarus, has been adopted in Kazakhstan for the normative iodine level in salt at production, import and trade, i.e., 40±15mg iodine per kg. The national legislation on IDD prevention is anchored in a comprehensive set of Decrees and Declarations by the President and the Government of the Republic of Kazakhstan, aimed to promote a healthy population as the basis for national development.

The key domestic salt producers are AralTuz (80-85 percent of domestic production), located near Aralsk in Kyzyl Orda Oblast, SuzakTuz (10 percent) in South-Kazakhstan Oblast and PavlodarSol (less than 10 percent) in Pavlodar Oblast. Salt producers conduct internal quality assurance of iodized salt production by overseeing the usage of the fortificant potassium iodate and its addition into food-grade salt during processing, combined with regular conduct of qualitative spot tests or quantitative measurements in production-based laboratories. The salt producers and traders are united in a National Association of Salt Producers, which represents their interests and reports on the national production statistics. Salt inspections in wholesale and retail markets as well as residential catering institutions are carried out by the Sanitary-Epidemiological Supervision (SES) authority, and the results are linked to obligatory quarterly reporting to the Chief Health Inspector of the Ministry of Health. Salt imports, which constitute approx. 15-20 percent of the total food-grade salt consumed in the country, are subject to mandatory Certificates of Conformity issued by the exporting country's food control authority and inspected by Kazakh Customs officials under the oversight of the Technical Regulation and Metrology Department under the Ministry of Trade and Industry.

Kazakhstan is located in central Eurasia. The size of its territory makes it the 9th largest country in the world. The population by January 2006 numbered 15.2 million. The urban and rural shares of the population are 57 and 43 percent, respectively. Almost one quarter of the population is less than 15 years of age and the number of newborns each year is close to 200 thousand. During the past 5 years, GDP growth in Kazakhstan has been among the highest in the world at 9 percent on average, boosted by a growing production of crude oil and natural gas. For example, Kazakhstan's 2003 oil exports were valued at more than 7 billion US$. Departing from a relatively low budget of less than 2 percent of GDP in 2003, the expenditure for national health care services is expected to grow to 4 percent by 2010, with a sizable projected increase in budget allocation for preventive public health services in the near future.

Prior to Independence in 1991, Kazakhstan was one of the USSR republics. The Soviet historical record offers ample evidence that following a period of quick success in controlling endemic goiter and cretinism during the 1960s, iodine deficiency had made a comeback during the 1980s after national oversight of the situation was abandoned and changes in iodine supply and biological status were no longer monitored for central consolidation and decision-making. The concurrent lack of funding for investments in modernization of the salt industry led to a serious deterioration in the quality and amount of iodized salt supplies in the entire Soviet Union by the time of collapse. Emerging in 1991 as a sovereign nation, Kazakhstan had to establish its own human, administrative and industrial basis for economic development. By 1996 the need for a national policy on nutrition, including IDD elimination, had become apparent and during the same year, the AralTuz Company, established in the 1950s already, was provided with financial and technical assistance by UNICEF as a first act to start building the national capacity for tackling the iodine deficiency situation in the population.

Two landmark events are especially noteworthy for their influence in shaping the national IDD elimination effort through USI in Kazakhstan, namely the Minsk agreement in May 2001 and the Almaty Forum on Food Fortification in October of the same year. The Minsk agreement among the Heads of State and Government of the CIS countries stated the political will for coordinated policy and collaboration in setting uniform national standards for iodization in the salt industry, as well as for the inspection of salt quality requirements by the national Sanitary-Epidemiological Supervision (SES) authorities. The Almaty Forum was a summit gathering of multi-sector national delegations, supported by the Asian Development Bank (ADB) and UNICEF that worked together on program development and agreement on the rules of engagement for joint public-private-civic collaborations to tackle vitamin and mineral deficiencies through food fortification. In immediate follow-up to the Forum, the Minister of Health of Kazakhstan entered into a cooperation agreement with ADB to stimulate the achievement of universal salt iodization and arrive at a significant increase in the fortification of roller-milled wheat flour of premium and first grade.

The ADB-managed JFPR grant project supported AralTuz and PavlodarSol in 2002 with equipment for salt iodization, potassium iodate, and packaging equipment against partial repayment of the costs. In 2005, the AralTuz Company invested in five automatic packing devices and new iodization spray equipment. During 2006, AralTuz production of iodized salt for consumer use was almost 65,000 ton. The production of iodized salt by PavlodarSol has remained low, and initially, of sub-par quality. Only by the end of 2006 does the internal laboratory record of the Company show that appropriate levels of salt iodization were attained. A new salt producer, SuzakTuz, emerged in 2004-2006 in South Kazakhstan Oblast. By the end of 2007, SuzakTuz expects to have adequate capacity in pace for quality assuring its production, estimated at about 5,000 ton per annum. The domestic supply is complemented by imports of about 15,000 ton per annum mainly from the Russian Federation and Ukraine. Salt companies purchase their KIO_3 from a domestic chemical import firm L-Pharma, which purchases it in the Russian Federation. The production and import statistics indicate that the amount of iodized salt supplied for use by the households and food manufacturing industries is sufficient for its population size.

High-level political oversight to ensure progressive execution of fortification policies is vested in an Interdepartmental Coordination Council on Food Fortification, headed by the Minister of Health and with members from the two Chambers of Parliament, relevant Government Departments, supportive international agencies, the NGO and scientific communities, and food industry sector (salt and flour) associations. For technical progress, the Committee of State Sanitary-Epidemiologic Surveillance, headed by the Chief Health Inspector of the Republic of Kazakhstan under the Ministry of Health, is the ultimately responsible agency. Data on the production and supplies of iodized salt

are included in the official State Statistical reporting by the Ministry of Health and the Agency on Statistics of the Republic of Kazakhstan.

A wide range of information about the dangers of IDD and the benefits of using iodized salt has been assimilated by the training and awareness systems of the Republic. Technical and methodical learning has been inserted in the basic and ongoing curriculums of primary health staff, institutions of academic learning and secondary schools. With technical and funding support from UNICEF and ADB, a comprehensive communications effort has been ongoing during 2002-2006 using a multitude of media materials and channels and with full participation of a broad array of national stakeholders orchestrated by the Kazakh Academy of Nutrition. The communications efforts played a significant part in the achievement of an uncommonly high awareness and acceptance level among broad swaths of the population that IDD is a significant threat to the intellectual performance of children and that the regular use of iodized salt is an effective remedy for its prevention. The systematic inclusion of civic society in the delivery of the communications drive at the "doorstep" of the population, the keen attention to ensuring that salt industry and its sales agents remain well-informed, the inclusion of food inspection and control bodies of SES and Customs in relevant training workshops, as well as the planned targeting of key politicians with specific information and advocacy were important factors for the success of the communications efforts.

Practically all necessary financing of costs associated with USI and IDD elimination have become incorporated in the ongoing expenditures of the private and public organizations involved. The salt producers and traders have assimilated the costs of iodization, reflecting it in the price of the product to their customers. The costs for inspections by SES and Customs authorities are carried in the State budgets of the respective agencies, as is the official reporting on statistics. Research and surveys related to the iodine nutrition situation in the population are requested on a periodic tender basis by the Ministry of Health, with the Kazakh Academy of Nutrition among the contenders. It should be noted that the budget of the Ministry of Health has a reservation for iodine supplement entitlements that is no longer needed because the evidence in Kazakhstan indicates that the USI strategy alone is sufficient to ensure adequate dietary iodine supplies in the population. Thus, the entitlements of State-financed iodine supplements on a mass scale may be discontinued.

Starting in 2005, the Committee of State Sanitary-Epidemiological Surveillance under the Ministry of Health has been building a national database to consolidate and track key performance indicators of USI and IDD elimination. The obligatory quarterly reports by the Republican SES of the salt iodine inspections, in combination with reports of the Customs Committee on iodized salt imports and the Committee on Technical Regulation and Metrology on the Certificates of Conformity are entered to reflect the iodized salt supply situation. In 2006, the Ministry of Health introduced in a report form for cases diagnosed with hypothyroidism or thyrotoxicosis with and without goiter. These data are under review for replacement in the future with newborn TSH data from a new national system of newborn screening for congenital developmental disabilities. The Ministry of Health recognizes the need for regular surveillance of the iodine consumption connected to iodine nutrition status in pregnant women. A scheme for collecting these data is being developed at this point in time.

On behalf of all partners and stakeholders in IDD elimination through USI, the Committee of State Sanitary-Epidemiologic Supervision under the Ministry of Health of the Republic of Kazakhstan is seeking acknowledgment by the global Network for Sustained Elimination of Iodine Deficiency that the USI goal has been achieved in Kazakhstan. An independent, objective international confirmation of progress achieved in Kazakhstan toward ensuring adequate iodine nutrition of the population will constitute a significant encouragement for all parties concerned to accelerate the joint efforts for overcoming the remaining public nutrition challenges by improvement of the common diet.

Country Profile

The Republic of Kazakhstan is located in central Eurasia. Its territory occupies 2.7 million km², making Kazakhstan the 9th largest country in the world by geographical size. Kazakhstan shares borders with the Russian Federation, Uzbekistan, China, Kyrgyz Republic, Turkmenistan and the Caspian Sea. The country consists mainly of plains and lowlands but there are massifs with notable peaks, for example, the spurs of Tien Shan Mountains in the east with the peak of Khan Tengri at 6,995m high. The climate is sharply continental and very dry. Most of the Republic receives only 100 to 200mm of precipitation per year. Average winter temperatures are -3ºC in the north and 18ºC in the south; summer temperatures average 19ºC in the north and 28-30ºC in the south. More than 85 thousand rivers and creeks flow across the country. The largest rivers are the Irtysh River with a stream length in Kazakhstan of 1,698km and the Esil (Ishim) River with 1,400km. The Syr-Darya River with a total length of 2,219km flows through all the four Republics in Central Asia and feeds the Aral Sea in Kazakhstan.

The Republic of Kazakhstan is a unitary state under presidential government[1]. The constitution "On State Independence of the Republic of Kazakhstan" dated 16 December 1991 proclaimed a principle of separation of powers into legislative, executive and judicial bodies. The supreme legislative body, the Parliament, is composed of the Senate and the Mazhilis. The Senate is comprised of five committees and the Mazhilis of seven committees. The supreme executive body is the Government of the Republic of Kazakhstan, comprised of seventeen ministries. The supreme judicial branch is the Supreme Court of the Republic of Kazakhstan.

Table 1. Structure of the population of Kazakhstan by oblasts and age groups

Oblasts and Cities of Republican subordination	**Population**	**Age structure**				
		0-4 years	5-9 years	10-14 years	15-19 years	20-24 years
1. Akmola	746,652	51,393	49,688	64,632	81,371	65,546
2. Aktobe	686,698	54,805	50,353	66,440	76,481	65,328
3. Almaty	1,603,758	128,598	118,741	153,438	178,067	151,783
4. Atyrau	472,384	46,627	39,803	48,593	53,533	44,302
5. W Kazakhstan	609,291	43,772	39,991	55,332	65,287	55,316
6. Zhambyl	1,001,094	92,222	83,163	105,104	108,777	91,793
7. Karaganda	1,334,438	89,480	81,170	106,110	132,144	120,445
8. Kostanai	903,178	54,078	51,990	70,527	91,458	37,957
9. Kyzyl Orda	618,249	62,706	61,309	70,819	68,675	57,657
10 Mangistau	374,430	41,820	32,521	38,478	39,922	35,132
11 S Kazakhstan	2,233,568	256,845	224,507	255,466	250,955	210,381
12 Pavlodar	742,911	47,080	41,779	56,908	75,846	67,089
13 N Kazakhstan	663,126	40,231	39,028	52,608	67,196	59,068
14 E Kazakhstan	1,431,180	87,798	82,235	112,761	142,396	127,334
15 Astana City	550,438	34,952	30,441	32,380	36,534	59,826
16 Almaty City	1,247,896	96,847	61,444	73,571	109,977	124,998
Republic of Kazakhstan	**15,219,291**	1,229,254	1,088,163	1,363,167	1,578,619	1,373,955

Administratively, the territory of the Republic of Kazakhstan is divided into 14 Oblasts (Provinces). In addition, two large cities – the capital Astana and the former capital Almaty are governed independently and mentioned separately in statistical books. The largest Oblast is Karaganda in the centre with an area of 428,000 km² and the most densely populated Oblast is South-Kazakhstan with a population of more than 2 million. As of 1 January 2006, the total population size was 15.2 million people, the population density 5.5 persons per km² and the natural population growth 8.05 per 1,000 people per annum. The urban and rural populations are 57 and 43 percent, respectively. Almost one-quarter of the population is under 15 years old; 65 percent is 15-59 years old (Table 1)[2].

[1] Constitution of the Republic of Kazakhstan. Article 2, Section 1 General Provisions

[2] Statistical Year Book of Kazakhstan, Almaty, 2005

Males in Kazakhstan have an average life expectancy of 60.3 years; females 71.7 years. In 2005, the median age of mothers at delivery was 27.7 years. The maternal mortality rate has decreased from 77.5 (1998) to 40.5 (2005) per 100,000 live births. During the last years infant mortality rate has reduced from 27.3 (1995) to 18.8 (2000) and to 15.2 (2005) per 1,000 live births[3].

In 2004, the gross domestic product (GDP) in Kazakhstan was 5,542.5 billion Tenge, equivalent to 40,741.5 million US$, or 2,714$ per capita[4]. GDP growth was stable in the last five years, and was higher than 9 percent in 2004 and 2005. Energy is the leading economic sector. Production of crude oil and natural gas amounted to 51.2 million tons in 2003, 8.6 percent more than in 2002. Kazakhstan raised oil and gas condensate exports to 44.3 million tons in 2003, 13 percent higher than in 2002. Gas production in 2003 amounted to 13.9 billion m^3, up 22.7 percent compared to 2002 Kazakhstan holds about 4 billion tons of proven recoverable oil reserves and 2,000 km^3 of gas. The planned expansion of production, coupled with the development of new fields, will enable the country to produce as much as 3 million barrels crude oil per day by 2015, lifting Kazakhstan into the ranks of the world's top 10 oil-producing nations. Kazakhstan's 2003 oil exports were valued at more than 7 billion US$, representing 65 percent of overall exports and 24 percent of the GDP. Major oil and gas fields and their recoverable oil reserves are Tengiz with 7 billion barrels; Karachaganak with 8 billion barrels (and 1,350 km^3 of natural gas); and Kashagan in the Caspian Sea with 7 to 9 billion barrels.

Table 2. State budgetary expenses for public health services

2002	2003	2004	2005	2006	2007
71,119.00 mln. Tenge	71,119.00 mln. Tenge	89,757.00 mln. Tenge	185,456.23 mln. Tenge	223,372.58 mln. Tenge	
			Budget of the RoK Ministry of Health 57.2 bln. Tenge	Budget of the RoK Ministry of Health 82.8 bln. Tenge	Budget of the RoK Ministry of Health 91.2 bln. Tenge
Percent of GDP:					
1.9%	1.9%	2.4%	2.48%		
Percent of the Republican State budget:					
8.9%	8.7%	12.8%	13.0%		

Sources: Ministry of Health: http://www.mz.gov.kz. Ministry of Finance: http://www.minfin.kz

The state budgetary expenses for public health services (including local budgets), expenses of the RoK Ministry of Health for medical services and the expenses of other Ministries and Agencies are provided in Table 2[5]. According to a special State Program for Public Health Service Reform and Development (GosProgramme) in 2005-2010, approved by Decree of the President of the Republic of Kazakhstan dated 13 September 2004 №1438, an annual increase of the financial input into the health sector up to 4% of GDP is proposed by 2010. To realize the State Program's actions, 53.5 billion Tenge was provided in 2006.

The budget for preventive medical examinations has increased 5.2 times, from 0.8 billion Tenge in 2005 up to 4.5 billion in 2006. To safeguard the sanitary-epidemiologic well-being in the population, modernization of accommodation and laboratory equipment at a cost of 1.7 billion Tenge of the regional centers of Sanitary Epidemiological Services took place in all the 14 Oblasts of the country during 2006. Also in 2006, targeted transfers of medicines and pharmaceutical preparations for

[3] Health of the Population and Public Health Services in the Republic of Kazakhstan. Statistical Collection Book of the Agency on Statistics of the Republic of Kazakhstan, Almaty, 2006

[4] Kazakhstan. 2006. Agency on Statistics of the Republic of Kazakhstan, Almaty, 2006

[5] Kazakhstan in Figures, Agency on Statistics of the Republic of Kazakhstan, Almaty, 2005

patients with socially-important diseases were allocated in the Republican budget to an amount of 5.1 billion Tenge. This included 0.5 billion Tenge for the provision of nutritional supplements for children under 5 years old in out-patient clinics, and 0.9 billion Tenge for iron and iodine supplements for pregnant women in antenatal clinics. The budget of the Ministry of Health for 2007 envisages 91.2 billion Tenge, 9.7 billion more than in 2006.

Short History of Iodine Deficiency Disorders and its Prevention in Kazakhstan

Pre-Independence

For nearly four decades, the actions directed at controlling iodine deficiency in the former USSR were regulated by Ordinance №.37-M of the Ministry of Health in Moscow, named "On Improvement of Measures to Fight Endemic Goitre", dated 14 February 1956[6]. This Ordinance defined the regions of the USSR affected with a high prevalence of endemic goiter to which iodized salt must be supplied, provided a legal basis for establishing special Anti-Goitre Dispensaries as well as a Central Anti-Goitre Commission and Anti-Goitre Committees in all affected regions under the Ministries of Health, laid out the capacity and training of health personnel in the Anti-Goitre Dispensaries, defined the control of Endemic Goiter as a matter of concern for other government entities (Ministries of Trade, Medical Industry, Food Industry, State Supply Committee, State Planning Committee and so on), and made the sanitary-hygienic stations of the Ministry of Health responsible for inspections of the quality of iodized salt.

All the Oblasts in Kazakhstan were listed in the USSR Ordinance as being affected[7]. An Anti-Goitre Dispensary became established in Shymkent, South Kazakhstan, and the supply of iodized salt became mandatory throughout Kazakhstan while the trade in non-iodized salt was generally restricted. The amount of iodized salt for each Oblast was defined by the State Planning and State Supply Committees of the USSR Government and supplied on requests by officials of the Ministry of Trade in all Union Republics for retail salt and the Ministry of Food Industry, Fisheries, etc. for food-grade salt. To produce and supply iodized salt, each salt enterprise was given an annual plan, which had the power of law. The production of iodized salt in the Soviet Union during the 1960s and 1970s was set at 4.5-5 kg/person/y. At that time, the production of iodized salt and the targeting of supplies at regions where endemic goiter occurred was a matter of high government concern and vigorous control.

The Ordinance of 1954 also mandated State-financed distribution of iodine tablets in the affected Oblasts to high risk groups of pregnant and breastfeeding women, children and adolescents. During the early 1950s, several pharmaceutical firms began producing iodine tablets called "Antistrumin", which contained 1 mg of potassium iodide. Supplements were distributed (1 tablet weekly) in schools and kindergartens and provided to pregnant women in prenatal clinics and breastfeeding women in maternity units on routine basis. A geological chemistry survey of the whole territory of the USSR was produced in the mid 1960s with a map of areas where the iodine content in soil and water was lowest and these areas were put under even stricter control in terms of the mandatory supply with iodized salt.

Following the Ordinance, two national surveys of Endemic Goiter were carried out in the USSR, performed primarily by teams from the special Anti-Goitre Dispensaries. By 1965, as many as 63 dispensaries had been established all over the USSR. Detailed information about the epidemiological design of the surveys is lacking, but it is likely that they were aimed at screening of large population numbers in all affected Oblasts, without specific selection criteria. The first survey in 1965 encompassed a total number of 13,238,428 persons. The national cumulative prevalence of goiters

[6] Gerasimov G: Iodine Deficiency Disorders (IDD) in the Russian Federation: A Review of Policies towards IDD Prevention and Control and Trends in IDD Epidemiology (1950-2002). Unpublished

[7] By a special Addendum to the Ordinance of the Ministry of Health of the USSR № 37-M, the following 13 regions of Kazakhstan were listed: 1. Alma-Atinstkay, 2. Gurievskaya, 3. Dzhambulskaya, 4. Kokchetavskaya, 5. Kustanayskaya, 6. Vostochno-Kazakhstanskaya, 7. Kzy-Ordinskaya, 8. Karagandinskaya, 9. Pavlodarskaya, 10. Severo-Kazakhstanskaya, 11. Semipalatinskaya, 12. Tselinogradskaya and 13. Chimkentskaya.

grade 1 to 5 was 6.24 percent, nodular goiter was 0.16 percent and medical treatment was recommended for 1.08 percent of the surveyed people. During the second survey in 1969, an even more significant number of people were surveyed, namely 30,119,542 persons. Grades 1-5 goiters had reduced to 4.98 percent, nodular goiter to 0.07 percent and medical treatment was recommended to 0.66 percent of those surveyed. Thus, despite the comparatively low prevalence of endemic goiter observed within a few years after the Ordinance had been put into effect, the prevalence of endemic and nodular goiter had fallen appreciably during the subsequent 4-year period. The sizable reduction was attributed to the tightening of the measures aimed at control and prevention, and especially the significant increase of the production and supplies of iodized salt.

Thus, by the beginning of the 1970s, the iodine deficiency situation of the population in the USSR had significantly improved. The occurrence of small-size goiters had decreased to a sporadic level, big-sized goiters had been virtually eliminated, and new cases of endemic cretinism were no longer observed. On this basis, endemic goiter was officially declared in the early 1970s as a problem that had been overcome, goiter monitoring was ceased at the national and regional levels and the special medical form for registering endemic goiter cases was abolished. The Anti-Goitre Dispensaries were to continue with their activities, but the results of their actions were no longer required for reporting to the Ministries of Health of the Soviet Republics and of the USSR. The overall national oversight of the situation was abandoned and any future changes were not monitored for central consolidation.

Although reliable data are lacking, it is not unlikely that the production of iodized salt in the USSR was maintained at a stable rate of approximately 900,000 to 1,000,000 tons during the 1970s and 1980s. The industry standard in the USSR required the use of potassium iodide at a relatively low level of 23±11 mg iodine per kg salt. Increasingly with time, the technology and QA methods in salt enterprises became less capable to achieve this range in the end product. Moreover, due to the instability of KI and high loss of iodine with poor packaging and long supply lines, the quality of iodized salt supplies in retail outlets started falling and by the mid 1980s, sanitary-hygiene stations reported findings of low quality of iodized salt. In 1986 for example, adequate iodine content was found in 57 percent of salt samples measured in Kazakhstan and only 10 percent in Belarus and 3 percent in Azerbaijan. Importantly, 19 percent, 5 percent and 35 percent of samples of iodized salt in these Republics, respectively, were reported to contain no iodine at all. At about the same time, also the amount of iodized salt production had started to decrease, along with to the overall decline in the centralized Soviet economy. By 1990, the production of iodized salt was at a level of 56 percent of the planned amount of 1.4 million tons.

The USSR Ministry of Health during the years 1986-1989 transformed the Anti-Goitre Dispensaries into Endocrinology Dispensaries, and changed their orientation from treatment and control of endemic goiter to diagnosis and treatment of other endocrine conditions, primarily diabetes. Although no extra resources were provided to meet these goals, the Center's primary orientation, i.e. control measures and monitoring of iodine deficiency in the population, was increasingly lost. Nevertheless, by the end of the 1980s after the Chernobyl Nuclear Power Station meltdown in 1986 which emitted a large amount of radioactive iodine into vast areas of Russia, Ukraine and Belarus, also the interest in the iodine situation in the population of the USSR started to return.

In 1990, the All-Union Endocrinology Research Centre in Moscow (now the Endocrinology Research Centre of the Russian Academy of Medical Sciences), in collaboration with the USSR Ministry of Health and the USSR Statistical Committee, organized a large-scale survey to assess goiter prevalence and morbidity. The medical registration form for cases of goiter was temporarily re-instated for 1 year, allowing results to be obtained from eleven of the fifteen former Union Republics. Unfortunately, the report of this survey has never been published, probably due to the liquidation of all USSR government ministries in 1991-1992. It is now impossible to get more detailed information about the epidemiological design of this survey. The survey recorded 1,044,767

persons with goiter in 1990, a marked rise over the 1969 figure. Of this number, 76,305 had visible goiter and 81,495 had nodular goiter. In some regions the number of records of patients had increased by 24 to 177% between 1988 and 1990. Due to the political and economical turmoil in Russia and the former Union Republics during the early 1990s, this information did not attract significant attention at the appropriate level, however.

Post-Independence

Upon the disintegration of the USSR, the economic difficulties associated with transition, privatization of salt and other food enterprises, and absence of regulatory acts and economic levers of incentives for the productive sector led to sharply reduced supplies of iodized salt by the end of 1990s. The share of non-iodized salt of domestic and foreign origins increased and was reflected in reports about increases in signs and symptoms of iodine deficiency in the population.

A summary of medical-clinical information of the iodine deficiency situation during the period after Independence was published as part of an international conference on the future of children, held in Almaty in 2004[8]. In the beginning of 1990s, a large survey in East-Kazakhstan Oblast reported hypothyroidism among children and teenagers in the Markakol and Katon-Karagai districts of 52-59 percent (4,590 persons were examined in 10 residential areas). Goiter among schoolchildren in Kentau town located in South Kazakhstan Oblast reportedly reached 26 percent (1,025 persons examined) while among adults, goiter rates as high as 50-60 percent were cited. International collaborative studies by Kazakh scientists in 1992-1993 showed that the incidence of congenital thyroid deficiency in South-Kazakhstan Oblast was twice as high in newborns of mothers with goiter as compared to those without. According to reports from obstetrical facilities in Almaty, hypothyroidism was diagnosed in 7.2 percent of newborns in 1996, i.e. 150-300 times higher than records from countries with national programs of iodine deficiency prevention.

The need to develop a national policy on nutrition, including IDD prevention, was raised for the first time in 1996 at an International Conference held in Almaty with support of UNDP, UNICEF, USAID and others, and the first action to start (re)building the national capacity for addressing iodine deficiency through the iodization of salt took place with assistance of the Central Asia Area Office of UNICEF also during that time. Financial and technical assistance were provided to the salt producing enterprise AralTuz in Kyzyl Orda Oblast by the installation of a spray iodization unit and the free supply of potassium iodate.

In 1999, in conjunction with a National Demographic Health Survey, the Kazakh Institute of Nutrition in Almaty (later renamed to Academy) carried out a first large-scale population-representative survey of iodine deficiency after Independence. The design and results of this survey are reported in detail in Chapter III. The median urinary iodine concentration among women of reproductive age was 95µg/L and 29% of the households in Kazakhstan used adequately iodized salt (15mg/kg and above)[9].

The President of Kazakhstan was among the supporters of the Inter-State agreement on the prevention of iodine deficiency in the Commonwealth of Independent States, signed in Minsk in May, 2001. This agreement among Heads of States stated "… the necessity of work to be performed within a framework of mutually agreed and mutually accepted systems of national control of quality and safety of foods during production, storage, transportation and sales". It further specified that: Parties shall pursue a coordinated policy of iodine deficiency prevention among the populations of

[8] Bazarbekova RB. On Improving the Specialized Endocrinology Service of Children of the Republic of Kazakhstan. Collection Book of the International Conference "Health of Children – the Problem and Future of the Nation", Almaty, 2004, pages 51-52

[9] Ospanova FE. Astana Medicinalyk Zhournaly 2001; 1, 109-111

CIS countries; and Parties shall work toward harmonization and unanimity of requirements as specified by national State Sanitary-Epidemiologic Supervision authorities for the development and adoption of unified methods of control over the composition of foods. A Special Resolution of the RoK Government dated 23 January 2003 №86 "On Ratification of the Agreement for Prevention of Iodine Deficiency Conditions among the Population of CIS Countries" was adopted to follow through on this Inter-State (Minsk) Agreement.

Policy-making on IDD elimination in Kazakhstan received a major impetus in October 2001 at the 1st Almaty Forum of Central Asian Republics and Mongolia. Uniquely, this Forum brought together multi-sector delegations composed of public, private, scientific and civic entities to discuss the policy and program needs, and define the national strategies, timelines and targets for tackling deficiencies of vitamins and minerals in the population by food fortification, and in the particular case of iodine deficiency, by universal salt iodization. The Asian Development Bank, fiduciary of a sizable grant from the Japanese Fund for Poverty Reduction (JFPR), had the main initiative in this Forum and worked in close collaboration with UNICEF.

At the end of October of 2001, the Minister of Health of the Republic of Kazakhstan entered into an official agreement with the Asian Development Bank (ADB) to provide support for execution of the Forum's recommendations. In the agreement, improvements of the amount and quality of iodized salt production and its use in the population were envisaged. The basic purpose of the efforts on the part of the Government of Kazakhstan, the salt producing industries and the society would be a steady improvement of the production of iodized salt, quality assurance of iodized salt by industry and SES inspections, social mobilization towards improvement of consumer acceptance of iodized salt and positive motivation for broad layers of society. While the target was stated as "at least 66% of production by the end of the project", the partner organizations in Kazakhstan were set to achieve more than that, and hoped for USI.

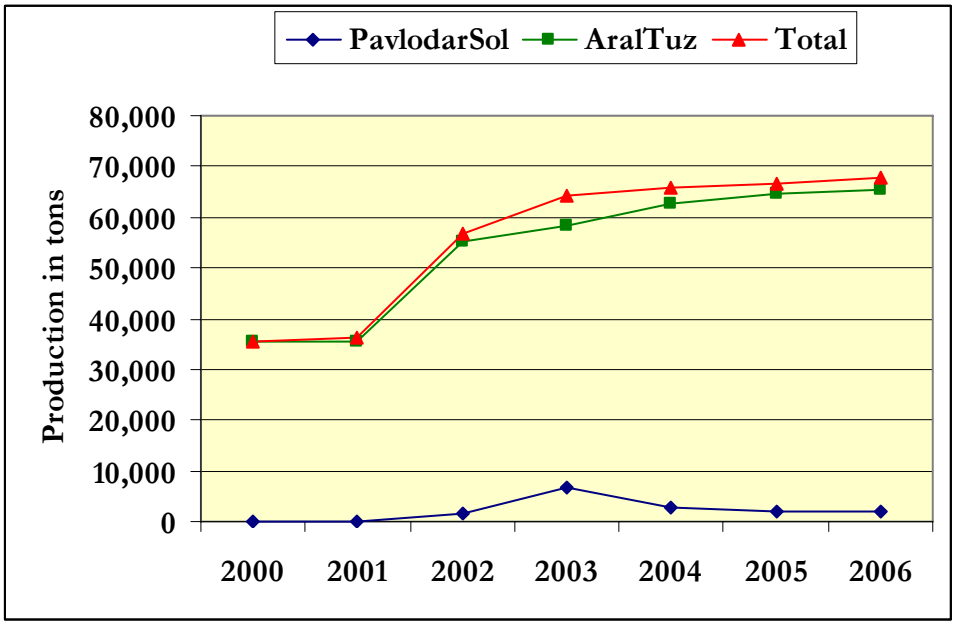
Country Assessment

A. Salt Iodization

1. Iodized Salt Production and Import

In its annual reports, the Agency of Statistics of the Republic of Kazakhstan has reported that the volume of domestic salt production increased from 173,564 tons in 2002 to 406,169 tons in 2006. It should be noted, however, that these figures also encompass the salt for industry purposes, notably oil and gas exploration. For an estimate of the improvement in iodized consumer salt supplies, the figures reported by the Association of Salt Producers of Kazakhstan give more pertinent guidance (Figure A.1). According to these reports, the production of iodized salt by AralTuz and PavlodarSol increased from 35,000 ton in 2000 to 67,700 ton in 2006.

Figure A.1: Domestic Iodized Salt Production, Kazakhstan 2000-2006



During the year 2006, a new salt production enterprise located in South-Kazakhstan Oblast (Province), SuzakTuz, entered the domestic market for consumer salt with an estimated sale of less than 5,000 ton. The company is still establishing its Sales Representative offices in Shymkent and Turkestan in the Oblast. It is likely that the sales of SuzakTuz in 2006 did not travel far beyond the borders of nearby Oblasts, namely Kyzyl Orda, Zhambyl and possibly Almaty Oblast and City.

The Salt Producers Association also reports that during 2005, 15,700 ton of iodized salt was imported from Russia (7,000 ton), Ukraine (8,400 ton) and Belarus (300 ton) on top of the domestic production of 66,500 ton. Thus, imported iodized salt made up approximately one-fifth of the domestic consumption. The export of iodized salt manufactured in Kazakhstan is less than 3,000 ton.

Taking the crude figure of salt consumption needs used in the salt industry of 5kg/person/y, the iodized salt consumer market would account to around 80,000 ton for a population of 16 million. The reported figures would indicate, therefore, that the markets for iodized salt of the population in Kazakhstan are being adequately covered by the stated supply sources.

2. *Quality of Iodized Salt, KIO_3 Availability*

Iodized salt manufacturing in Kazakhstan proceeds generally as follows: Upon extraction of raw salt from its lake deposit, it is hydro-milled in one or more stages to remove impurities and dried in the open air at environmental temperature. If necessary, salt may be heated to 80ºC to arrive at less than 0.5 percent humidity before iodization. The salt is spread by a vibration hopper onto a continuous belt and sprayed at a calibrated rate with saturated solution of potassium iodate before entering a screw conveyer that mixes and delivers the end product to a final automatic bagging or hand seal-packaging station. Salt samples of for laboratory testing are taken at this final point of processing.

Figure A.2: Laboratory Journal of Iodized Salt Measurements at PavlodarSol Company

Each of the salt production enterprises in Kazakhstan has a QA manager responsible for input control of raw materials and oversight of proper processing conditions, while using industrial specifications approved by Government (RoK ST GOST P 51575-2003) as the normative standard that should be met. Routine laboratory measurements include humidity and particle size distribution of the end product. During iodized salt production runs in AralTuz and PavlodarSol, the level of iodization of the salt is measured by titration 2 times a day, while entering the results in a journal for internal control (Figure A.2) with columns for: date and time of the test, and concentration of iodine and humidity in salt. The laboratory journal is inspected during the visit by a SES official at regular intervals.

The basic supplier of the potassium iodate (KIO_3) fortificant in Kazakhstan is "L-Pharma" company in Almaty which sources it from a chemical company Troitskii ChimZavod[10] based in Uralsk, Russian

[10] See http://www.iod.ru/index2.html

Federation. Portions of 0.5, 1 and 3 kg KIO_3 are packed in a double layer lightproof film, wrapped up in paper and boxed in units of 30 kg. The stated expiry period for storage is 3 years. The cost to salt producers of 1 kg of KIO_3 is 4,300 Tenge or 35.00 US$ including taxes. In 2005, L-Pharma import firm sold 4,140 kg KIO_3 and in 2006, 3,420 kg to salt producers in Kazakhstan. According to the manufacturer's information, KIO_3 can also be used for the manufacturing of veterinary goods, as a component of clearing solutions for processing of heavy oils, coal and sewage, and in non-electrode cyanide processing of gilding. In addition, it is applied in the cosmetic industry as a component of shampoos for neutralizing smell. None of these other applications are known to take place in Kazakhstan, however.

3. Investments and Development of Production

A brief summary description of the salt industry situation in the Republic of Kazakhstan in 2005-2006 is provided in Table A.1. The Table is composed of a combination of data from the Association of Salt Producers and the Republican Agency of Statistics.

Table A.1: Brief Description of Salt Industry Status in Kazakhstan (tons)

			Iodized	**Non-iodized**	**Total**
2005	Total quantity of produced /imported salt (total quantity of salt in the country)	Total	83,400	275,543	358,943
		Local production	67,700	269,143	336,843
		Imported salt	15,700	6,400	22,100
	Industrial salt (non dietary)	Total	-	269,143 - domestic 6,400 - imported	275,543
	Dietary salt (including fodder salt)	Total	83,400	-	83,400
		Local production	89,521	408,781	498,302
		Imported salt	68,171	406,169	474,340
2006	Total quantity of salt produced/imported in the country	Total	73,936	408,781	482,717
		Local production	65,171	406,169 – domestic	471,340
		Imported salt	8,765	2,612 - imported	11,377
2007 1st quarter only	Total quantity of salt produced/imported in the country	Total	21,491	22,223	43,724
		Local production	15,508	21,561	37,069
		Imported salt	5,983	672	6,655

Kazakhstan makes transactions related to salt export and import with a number of European and Central Asian countries such as Azerbaijan, Belarus, Iran, Kyrgyz Republic, China, Russian Federation, Tajikistan, Turkmenistan, Turkey, Uzbekistan and Ukraine. Salt for industrial use is imported from Great Britain, Germany, Italy, the Netherlands, Poland, Korea, USA and France.

The veteran enterprise dealing with lake salt extraction and production is AralTuz located near the town of Aralsk on the Aral Sea in Kyzyl Orda Oblast. Iodized salt production at AralTuz had already started in the 1960s as part of the centrally directed endemic goiter Ordinance of the former USSR but like other enterprises, the overall salt production capacity had significantly eroded by the time of Kazakhstan's Independence from the lack of investment funds for modernization. Notwithstanding the competitive efforts by other domestic companies and reputable suppliers from the Russian Federation, the AralTuz Company remains the major supplier of salt for technical purposes and it covers approx. 80-85 percent of the domestic market of iodized consumer salt in Kazakhstan.

The active collaboration by the domestic salt companies in the national IDD elimination program, in combination with the communications support work, equipment provision and the training of the laboratory technicians and managers in the enterprises have had a great influence on the increases of the amount and quality of iodized salt production in Kazakhstan. According to results of laboratory tests during iodized salt manufacturing in the AralTuz enterprise, there has been a steadily increasing trend in the production and quality of iodized salt during the period 2000-2006. In 2005, Araltuz invested in five modern packing automatic devices, made in the Russian Federation and valued at

17.2 million Tenge. This increased the productivity of the processing line, improved the durability and tightness of cross-section seams of the 1kg packages, and added modern photo-labeling of the packages with an automatic imprint of the manufacturing date on each package. Also a new pump for the iodization spray unit was purchased by AralTuz in 2005 for 3,300 US$. Araltuz has plans for the construction of a new factory for iodized salt manufacturing using Spanish technology in Aralsk town, Kyzyl Orda, in 2007-2009. The new factory is meant to meet state-of-the-art ISO standards.

In the period that AralTus was expanding its iodized salt production, PavlodarSol, the 2nd important domestic supplier of consumer salt remained lukewarm to the national élan. The amount of salt supplies from PavlodarSol has remained small throughout a period of rapid changes in management. The quality of iodized salt was often a reason for failing inspections. During a visit to the Solyetska salt lake production facility of PavlodarSol in June 2007, however, the data entries in the laboratory journal made apparent that the quality of the iodization step has improved markedly from previous levels that fluctuated around 25mg/kg into September 2006, toward a narrow range around 40mg/kg by the end of 2006. Into 2007, the enterprise journal showed evidence that these levels were maintained (See Figure A.2). The improvement coincided with the relocation of the company's QA laboratory from its administrative office in Pavlodar City to the production facility in Solyetska, thus promoting an immediate feedback of the laboratory results to the production line manager.

As described above, the company SuzakTuz emerged in the market in 2006. The factory is located in the small township of Suzak, South-Kazakhstan Oblast at 150-200 km north-northeast of Shymkent, the Oblast capitol. The company harvests salt from a natural salt lake located at more than 100 km from the processing factory in Suzak. The continuous processing line consists of dry milling, an electrical furnace and a drip iodization unit followed by a screw conveyor and bagging station for 1kg hand-sealed packs. At the time of a visit in June 2007, the company had ordered but not yet received iodization spraying and titration equipment for iodine measurements. A laboratory room had been prepared already with a mounted electrical water distillation unit and work benches.

The main goals of the Association of Salt Producers in Kazakhstan, established in 2005, include the coordination of joint actions aimed at promotion of Kazakh's salt products for internal and foreign sales markets, protection against adulterated products including imported products, improvements in production of quality iodized salt, improvement of process technologies, and solution of other corporate issues. The Association's members include AralTuz JSC, SozakTuz LLP, Salt Trade Company LLP, Salt Industries LLP, Tuz LLP. The office of the Association is located in Almaty.

4. Marketing, Demand and Use, Consumer Awareness

All the salt companies supplying salt in Kazakhstan have their marketing personnel who deal with the wholesalers and retailers. The marketing managers make estimates of the size of regional and local urban, rural and institutional markets for iodized salt to project the quantities for delivery. Also, the marketing departments analyze preferences of the population for special kinds of salt, for example for vegetable conservation and pickling, which, in popular opinion, should not be iodized. Araltuz solved this issue by positioning a salt type in a different package designed with an inscription "Salt for conservation and pickling" even though this salt is iodized according to the agreed-upon State standard. Dealers of the salt companies conclude contracts for the delivery of iodized salt to the local customers in their own circumscribed settlements. Finally, the dealers conduct investigations about salt falsification and salt smuggling, for example by using rapid quality tests of salt of competing manufacturers using the semi quantitative spot-tests with kits supplied through the Association of Salt Producers during 2004-2006. On finding improperly or non-iodized salt, which may mean illicit or forged salt, the dealers of the salt companies write complaints to SES supervising bodies, financial police, Customs, or the Office of the Public Prosecutor.

Salt producing companies independently conduct advertisements to promote iodized salt. They also work on promotion of acceptance of quality assurance standards in industry such as ISO. AralTuz Company participates in international exhibitions of the food sector, such as "Food Industry" and other large fairs. For example, Araltuz was awarded two gold medals at the 11th International Food Industry Exhibit "Food Expo Kazakhstan 2005" in Almaty, in recognition of the high quality of its products and a new cardboard packing for iodized salt. Araltuz also participated in an international Forum on Prevention of iodine deficiency, organized in Peking in 2005 and soon, cooperation with China Salt was started. In 2005, during the ADB JFPR9005 End-of-Project Conference, a general director of Araltuz noted that the preference of the population for iodized salt of Araltuz increased appreciably during a consumer organization campaign of salt testing in Kazakhstan's retail markets. However, an analysis of the influence of iodized salt advertisement *per se* on public awareness has not been conducted by any salt company yet.

5. *Use of Iodized Salt in Food Industry*

Under the legislation, all food salt is subject to mandatory iodization and this includes the salt used as part of the recipe for industrial manufacturing of foods. Food salt is used in major sectors of food industry: bread manufacturing and bakeries, macaroni and confectionery production, manufacture of meat, fish preservation, sausage production, dairy, cheese and sour-milk production. From a strategic viewpoint, the benefit for the population of the compulsory use of iodized salt in the food industry is obvious: When for medical reasons, physicians advise their patients to restrict the use of salt in the household, their consumption of adequate iodine remains ensured by the consumption of additional iodine from common foods.

Despite the overwhelming worldwide evidence of the beneficial use of iodized salt in the food industry for human consumption and the weakness of objective evidence that it impacts on the quality characteristics in the end product, a small number of producers in Kazakhstan have continued being resistant. A caviar producer on the Caspian Sea has been granted permission to use non-iodized salt for its manufacturing of a low-salt "Malossol" caviar specialty in an attempt to protect the company's export market against the competition by Russian Malossol caviar exporters. More importantly, however, industrial producers of a hard cheese variety named "Rennet" have put pressure on Government officials on basis of an exemption given to Rennet cheese manufacturing during the previous Soviet time. The Ministry of Health has requested that the Committee on Technical Regulation and Metrology under the Ministry of Trade and Industry affirms a list of food products, prepared by the Ministry of Health, that are permitted to be manufactured with the use of non-iodized salt. The list is appended to a proposed amendment to the Law "On Prevention of Iodine Deficiency Disorders" submitted to Parliament on 29 August 2006. The amendment forbids the "manufacture, import and sale of non-iodized salt on the territory of Kazakhstan, except the two aforementioned exemptions". Contrary to the basic intent of pursuing the national USI strategy by a complete ban, non-iodized salt in the markets of Kazakhstan has become no longer illegal.

B. Policy and Program Development

1. *Analysis of Legislation*

The Country Profile above has briefly described the principal powers as laid down in the Constitution of the Republic of Kazakhstan. Typically, the national legal structure evolves with time under the direction of the President (Presidential Decrees), followed by Parliamentary decisions (Government Resolutions) and Government regulations (Ministerial Orders). The direction (Decrees and Orders) by lower level officials is governed by national legislation and in a similar fashion, the

norms and standards agreed for practical application by the industry are reflecting the decisions agreed upon in the public sector.

Thus, the legal structure for USI and IDD elimination starts with the decisions made by the President on the principles for promoting health and preventing disease in the Kazakh population. Relevant Presidential Decrees are:

- № 3936 "On Primary Measures for the Promotion of Health of the Citizens of the Republic of Kazakhstan", dated 18 May 1998
- № 4145 "On the State Program Health of the Nation", dated 16 November 1998 and amended 15 January 2003
- № 344 "On Further Implementation of the Development Strategy of Kazakhstan till 2030", dated 17 February 2000,
- № 489-PZ "On Prevention of Iodine Deficiency Disorders", dated 14 November 2003, and
- № 1438 "On the State Program for Public Health Services Reform and Development 2005-2010", dated 13 September 2004.

Resolutions adopted by Government that specify concrete ways, methods and actions to address iodine deficiency have been as follows:

- № 710 "On the Concept of Healthy Lifestyle and Healthy Nutrition", dated 7 June 1999
- № 905 "On the Integrated Program Healthy Lifestyle", dated 30 June 1999
- № 999 "On the National Action Plan to Improve the Status of Women", dated 19 July 1999
- № 1783 "On Approval of Instructions for Quality and Safety of Foods and Raw Food Ingredients", dated 29 November 2000
- № 1283 "On Prevention of Iodine Deficiency among the Population 2001-2005", dated 5 October 2001, and
- № 289 "On Approval of Action Plan for Implementation of the State Program "Health of the Nation" 2003-2005, dated 21 March 2003.

Universal salt iodization is mandated in the Decree of the President № 489-PZ, dated 14 November 2003, "On Prevention of Iodine Deficiency Disorders":

- Article 11, on Requirements for Quality and Safety of Salt, states:
  - Dietary and fodder salt produced on the territory of the Republic of Kazakhstan is subject to mandatory iodization
  - It is prohibited to produce, import, and sell salt on the territory of the Republic of Kazakhstan if iodization requirements established by the Article are not compliant, and
  - It is prohibited to produce, import and sell adulterated dietary salt.
- Article 14, on Requirements for Packing, Labeling and Storage of Iodized Salt and other Foods Fortified with Iodine Compounds, specifies:
  - The package of iodized salt and other foods fortified with iodine shall contain the following information written in national and Russian languages: nutritional and caloric value, content of iodine compound, designation and conditions of use, and storage terms and conditions.

2. Government Practices

According to the Order of the Prime Minister № 64-P, dated 25 March 2005, On Measures of Execution of the Law "On Technical Regulation", there is a two-level system of technical regulation of laws, namely (1) Obligatory regulatory legal acts (technical regulations) accepted at the government level, and (2) voluntary standards and other regulatory documents. As to obligatory acts, the Ministry of Industry and Trade (either through The Committee for Technical Regulation and Metrology or

the State Committee for Standards and Metrology) has responsibility on behalf of the State to establish acceptable safety requirements for products by setting product safety and compliance requirements. For this purpose, 141 agencies to verify product compliance with safety requirements and 394 testing laboratories have been accredited in Kazakhstan. Among these, 34 agencies and 40 testing laboratories deal with food products. The two State Committees perform these activities in compliance with the Laws "On Technical Regulation" dated 9 November 2004, "On Provision of Uniformity of Measurements" dated 7 June 2000 and "On Consumer Protection" dated (please insert date).

As described in the History of Prevention and Control of Iodine Deficiency Disorders, the President of Kazakhstan has co-signed the Inter-State Agreement of Minsk in May 2001, on joint collaboration in the Commonwealth of Independent States in preventing iodine deficiencies. The interstate standard GOST 13830-97 on "Dietary Table Salt" is accepted as an obligatory act of technical regulation for the CIS countries in relation to the universal iodization of food-grade salt. The Minsk document provides for exclusive competence of public health authorities of each of the CIS countries to define the type of iodine fortificant, the required iodine concentration in salt and the methods of quality control of iodine content in salt. The production, quality and safety of foods, dietary supplements and therapeutic products is governed by the regulatory document SanPiN 4.01.071.03 and by technical standards for foods, approved by both the Ministry of Health and the Ministry of Industry and Trade. Following the Inter-State agreement at Minsk, the standard for iodized salt (ST RK GOST P 51575-2003) has been set at 40±15 mg/kg which is also in accordance with recommendations of ICCIDD, UNICEF and WHO.

Prevention of IDD in Kazakhstan is not being pursued by the strategy of universal salt iodization alone. A Presidential Decree № 1438 "On the State Program for Public Health Services Reform and Development 2005-2010", dated 13 September 2004, was followed by an Order of the Ministry of Health № 637, dated 23 December 2005 on the "List of Diseases and Categories of the Population, the outpatient treatment of which is supported with free-of-charge medicines and specialized dietetic therapy that are prescribed under favourable conditions". This Order provides for the entitlement of pregnant women and children under two years old to State-financed iodine supplements.

The Ministry of Health of the Republic of Kazakhstan has also submitted for consideration to the Government on 29 August 2006 a project of proposed amendments to the Law "On Prevention of Iodine Deficiency Disorder", which envisages the permission of the use of non-iodized salt for manufacturing of certain grades of rennet cheese and salted caviar of export value.

3. Food Inspection and Control

The Ministry of Health has issued an Order № 641 "On Approval of Rules for Monitoring of Quality, Production, Storage, Import and Sales of Iodized Salt and other Foods Fortified with Iodine Compounds", dated 18 August 2004, which commits the agencies and authorities of SES to carry out regular sanitary-hygienic inspections of salt quality at production, storage, import and sale of iodized salt, followed by quarterly reports from the Oblast SES to the Republican Sanitary-Epidemiologic Station (RSES). Every quarter, RSES must present the information from inspection results to the Committee of the State Sanitary-Epidemiologic Supervision under the Ministry of Health. Execution of the Order is overseen by the Chief Health Inspector who is Chairman of the Committee of State Sanitary-Epidemiologic Supervision under the Ministry of Health.

Control of import and trade in salt by commercial enterprises is the responsibility of authorities of the Committee on Technical Regulation and Metrology of the Ministry of Industry and Trade and regulated by mandatory Certification of Conformity (CoC). On 20 April 2005, the Ministry of Industry and Trade approved a list of products that are subject to mandatory CoC, "food salt" being

included in the list. An example of a Certificate of Conformity of Iodized Salt to safety requirements ТУ 5510 РК 00393293 and СанПиН 4.01.071.03 is presented in figure B.1. Obtaining a CoC depends on the QA level inherent to the production enterprise. If a company has obtained ISO or HASSP standards, a CoC is valid for 2-3 years. If an enterprise has no such international standards, certification occurs during the output of each batch of products. According to the 2007 budget plan of the Ministry of Industry and Trade, 20 million Tenge were allocated for purchases of samples of products, including food, and for independent assessment of the CoC, including iodized salt.

Figure B.1: A Certificate of Conformity of iodized salt

ГОСУДАРСТВЕННАЯ СИСТЕМА СЕРТИФИКАЦИИ
РЕСПУБЛИКИ КАЗАХСТАН

Павлодарский филиал ОПС АО "НаЦЭкС"
140007 г.Павлодар, ул.Жамбылская,2

KZ.5510092 КСС № 1919016

СЕРТИФИКАТ СООТВЕТСТВИЯ

16 августа 2006 г. № KZ.5510092.01.01.04839

Действителен до 16 августа 2007 г.
при соблюдении условий хранения

1. Настоящий сертификат удостоверяет, что должным образом идентифицированная продукция Соль поваренная пищевая йодированная
самосадочная сорт 2 помол 1 код КП ВЭД 1404010
код ТН ВЭД 2501009110
серийное производство
изготовленная Казахстан
ОАО "Павлодарсоль", Калийный солепромысел
соответствует требованиям безопасности (качества), установленным в
ТУ 5510 РК 00393293 ОАО-002-2005;
СанПиН 4.01.071.03

2. Заявитель (продавец, изготовитель) ОАО "Павлодарсоль"
Казахстан, г.Павлодар, ул.К.Маркса,326

3. Сертификат выдан на основании заявки о соответствии от 16.08.2006г.
ОАО "Павлодарсоль"; п.и.№1598-п от 16.08.2006г. ИЦ ПФ АО "НаЦЭкС"
KZ.71.00000.06.09.00154; п.и.№11-2616 от 06.02.2006г.
ГУ "Центр санэпидэкспертизы Павлодарской обл."

4. Дополнительная информация упаковка полимерные пакеты 1кг

М.П. Подпись руководителя органа по сертификации или уполномоченного им лица Л.П.Баранова
Подпись эксперта-аудитора С.Г.Жавато

ВНИМАНИЮ ИЗГОТОВИТЕЛЕЙ (ПРОДАВЦОВ) И КОНТРОЛИРУЮЩИХ ОРГАНОВ!
КОПИИ СЕРТИФИКАТА ВЫПОЛНЯЮТСЯ ТОЛЬКО НА БЛАНКАХ УСТАНОВЛЕННОГО ОБРАЗЦА

Oblast and District SES authorities collect data on the number of physical persons and legal entities involved in production, storage, import and sales of food products according to types and quantities of product. They perform tests of the quality of food products against standards as approved by Government (see above). The results of these investigations and inspections must be submitted each quarter to the Republican SES by the 20th day of the last month. In turn, the Republican SES must submit the summarized data by Oblasts of Kazakhstan to the Committee of the State Sanitary-Epidemiological Supervision under the Ministry of Health by the 25th day of the last month. The data across Kazakhstan obtained by SES with the quantitative method of titration are consolidated in a database. Table B.2 illustrates the recent results of the quality inspections by SES of iodized salt in Kazakhstan.

Table B.1: Inspections of iodized salt by SES bodies in Kazakhstan, 2005 - 2007

	Total amount of salt samples	**Content of iodine in salt 40±15ppm**	**Percentage adequately iodized salt**
2005	**9,839**	**9,544**	**97%**
2006	**11,093**	**10,837**	**98%**
I quarter	1,854	1,817	98%
II quarter	2,461	2,395	97%
III quarter	3,366	3,299	98%
IV quarter	3,412	3,356	98%
2007			
I quarter	2,331	2,286	98%

The arbitration of disputes with enterprises about the results of inspection is assisted by laboratory counter-measurements in the National Iodine Laboratory at the Kazakh Academy of Nutrition.

Since 2006, 245 territorial SES inspectors (National, Oblast and District) and 300 inspectors of the Committee of Standardization and Metrology participate in overseeing the iodized salt markets and trade in Kazakhstan. A draft Joint Order of the Ministry of Health, the Ministry of Finance and the Ministry of Industry and Trade "On Interactions of Monitoring of Import, Production, Storage, Transportation, and Sales of Dietary Iodized Salt" is the process of approval. Based on this Order, information gathered from the Committee of Customs Supervision on iodized salt import and from the Committee on Technical Regulation and Metrology on conformity or endorsement of iodized salt to technical standards will be consolidated in the database of the National Committee on Sanitary and Epidemiologic Supervision of the Ministry of Health.

4. National Administration

At the political level, an Interdepartmental Coordination Council, headed by the Minister of Health, has been established by Ministry of Health Order № 776 of 28 October 2004. The membership of the Council is comprised of Members of the two Chambers of Parliament – Senate and Mazhilis - and representatives of relevant Departments of the Government Ministries, the ADB country office, UNICEF Office in Kazakhstan, the Association of Salt Producers of Kazakhstan, the Confederation of Nongovernmental Organizations, the Kazakh Academy of Nutrition, the National Center for Promotion of Healthy Lifestyles, and the Union of Grain Processors and Bread Producers of Kazakhstan.

Technically, the Ministry of Health of the Republic of Kazakhstan, in particular the Committee of State Sanitary-and-Epidemiologic Supervision under the Ministry of Health and headed by the Chief

Health Inspector of the Republic of Kazakhstan, is the responsible agency for implementation of the Iodine Deficiency Disorders elimination Program in Kazakhstan.

5. Education and Training

The Kazakh Academy of Nutrition has taken a lead role in the effort to insert technical learning of IDD elimination through USI into the curriculums of public secondary schools and technical training as well as continued education programs. Two booklets written by Academy experts were used for insertions in educational programs after approval by the appropriate authorities, namely

- Tsoj IG, Kulmurzaeva LR and Ospanova FE. The Alimentary Prevention of Iodine Deficiency. Methodical Recommendations for the Public Health System, Almaty, 2003 and
- Tsoj IG, Kulmurzaeva LR and Ospanova FE. Prevention of Iodine Deficiency in Kazakhstan by Iodized Salt. Methodical recommendations for teachers and educational staff, Almaty, 2003

The materials developed by the Kazakh Academy of Nutrition for medical staff were approved by the Scientific Department under the Ministry of Health in 2003, and then distributed all over the country to the policlinics of small towns, district, and rural medical units through Oblast healthcare departments. The regional branches of the National Centre for Healthy Lifestyle and the Centres for Health Strengthening has trained medical staff of more than 1,000 territorial points of primary medical and sanitary assistance in the country. Education on preventive measures against iodine deficiency is included in the curriculum of primary health care personnel. As long-term and permanent infusion into the healthcare system of the Republic of Kazakhstan it is necessary to use the training resources of the Almaty State Institute of Doctors' Advancement (ASIDA) under the Ministry of Health and the same faculties of doctors' advancement under the Medical Academies and Universities; and also resources of the Republican Medical College (Almaty city) and large oblast medical colleges to advance the professional level of the middle medical staff of the country. Knowledge on IDD prevention is being introduced into the curriculums, and the pre- and post-degree preparation courses of the aforementioned medical institutions. The methodical materials for teachers of the state secondary schools developed by the Kazakh Academy of Nutrition were approved by the Republican Educational and Methodological Council of the Ministry of Science and Education of the Republic of Kazakhstan in September 2002 and recommended as an additional study material to be used in the course of natural science subjects at schools. These teaching and methodological materials together with laboratory sets for spot-tests were provided to all 8,200 state schools of Kazakhstan through the Oblast education departments.

All territorial and district staff of SES under the Ministry of Health received a training on methods for inspection of iodized salt in 2004 with repetition in 2006 through cascade workshops. In 2004, with repetition in 2006, territorial and district officers of the Customs Committee under the Ministry of Finance received training on border control of import and export of iodized salt through cascade workshops. In addition, with the purpose to prevent import of non-iodized salt import, the officers were provided with kits to perform spot tests at the customs points on the country's borders. Finally, also trainings of territorial/regional staff of the Committee on Technical Regulation and Metrology of the Ministry of Industry and Trade were carried out in 2005-2006.

Trainings of salt producers' employees, technical laboratory personnel, and salt dealer networks were carried out in 2004-2005. Dealers of the salt producing companies were instructed on application and use of semi quantitative spot-tests. The Association of Salt Producers in Kazakhstan was provided with semi quantitative spot-tests, informative communication materials, and materials on use of "Healthy food" trademark which has been shared with their member network.

6. Communications Plan, Tactics and Execution

The national communications plan in Kazakhstan took shape on basis of two successive workshops in 2002, in combination with a study on "Knowledge, Attitudes and Practices" (KAP) conducted by the National Center for Health Promotion (now renamed to National Healthy Life-Style Promotion Center) in 2001. The KAP study revealed serious gaps in the population's and health providers' knowledge on the issues of iodine deficiency and its prevention. While the population was aware that IDD existed, people believed goiter is the largest risk and they did not realize the risk to intellectual development in new generations. Likewise, health professionals knew that the IDD problem existed in Kazakhstan, but were not aware that consumption of iodized salt was effective in preventing it.

Supported by the ADB-JFPR9005 project, a regional Communications/Social Marketing Workshop held in Bishkek, February 2002, emphasized the need for developing national plans with coordinated three-tiered attention to[11]: (a) Advocacy and Resource Generation, (b) Alliance Building and Organizational Motivation, and (c) Community Information, Education and Communication. In Kazakhstan, the development of a specific national plan took place in July 2002 in follow-up to this outline and with expert support from an experienced public health communicator of CDC, Atlanta and a free-lance experienced Russian-speaking communication expert. The step of national plan development took place with participation of a very broad array of stakeholders. The output of this process was a detailed communication plan, broken out by several target groups, for the promotion of fortified salt and flour. The plan specified communication tactics by channels and stages, and defined problems, knowledge and behavior achievement targets, and the communication concepts and associated messages. The workshop also created a Technical Advisory and Implementation Group (TAIG) and a Communication Coordination Committee to whom they report. The TAIG then developed an Implementation Plan with concrete responsibilities and a timeframe.

6.1.Pilot tests

In 2002 immediately following national plan development, the Kazakh Academy of Nutrition with support of the National Healthy Life-Style Promotion Center and selected PR firms drafted educational communication materials and tested them in small focused interviews among specific target groups. Upon adjusting, these materials then were tested for their effectiveness during 2002-2003 in South-Kazakhstan Oblast as pilot region. The full-fledged pilot schedule included the development, publication, and distribution to different target population groups of a whole set of specific educational materials on IDD prevention as well as press conferences, presentations, training seminars for NGO employees, mass media, salt producers' dealers, and promotional TV reels to spread the advantages of iodized salt consumption. Conceptually, the communication pilot was directed at preventive measures against iodine deficiency and aimed to reach large population groups using state resources of the healthcare and education sectors, the mass media of the region and NGO public organizations. Sets of 12 kinds of printed and video products on iodized salt with specific messages (leaflets, booklets, brochures, posters, methodical manuals, comics, videos) were delivered to the pilot region for different target groups. Target groups were determined as: local political authorities; salt producing enterprises and traders; state bodies of primary medical and sanitary services; state middle schools and universities; young schoolchildren and teenagers; pregnant women; mass-media workers; and adult population as a whole. These groups, especially in rural areas, were enlightened on the issues of iodine deficiency and the desirability of constant consumption of only iodized salt, principles of iodized salt storage and use during cooking, while promoting the trademark of iodized salt "Healthy food/Sapaly azdyk". At the end of 2003, with the support of ADB-JFPR9005 and the Kyrgyz representative office of Swiss Red Cross, monitoring surveys "Testing of the quality of iodized salt in rural and urban households" (total 90,995 households were surveyed)

[11] Gleason G. Communications Issues Paper, presented at the JFPR9005 Final Conference, Almaty, 2004

and interviews of the population were conducted in South-Kazakhstan Oblast. Results of the pilot efforts were published[12] and used for fine-tuning of the national communication campaign.

In summary, the awareness on IDD among the population in the pilot region was improved and the awareness on iodized salt as the means for prevention had increased from 43 to 61 percent. Virtually all respondents had heard about iodized salt; 95 percent of respondents stated that they knew the advantages of iodized salt. The basic sources of trusted information were revealed: medical workers (76 percent) and TV (42 percent). Educational channels on benefits of iodized salt use were revealed: TV (76 percent), medical workers (48 percent), schools (39 percent) and newspapers (34 percent); 98 percent of the respondents had bought iodized salt and the percentage of households that still had consumed non-iodized salt decreased from 9 to 3 percent for the 4th Quarter of 2003.

6.2. National communication campaign roll-out

The first stage of a national communication educational and advertising campaign aimed at reduction of iodine deficiency was executed in 2003; the second stage continued into 2006.

According to results of pilot communication campaign, among the population, the basic confidential and preferable sources of the information about IDD and benefits of iodized salt consumption were TV and medical workers. In addition, wishes of NGOs on release of special brochures have been revealed. Therefore, national TV as three national channels with special programs on the issue of prevention of iodine deficiency was more widely used in the National campaign. Twelve kinds of published products mentioned above and video products on iodized salt with specific messages for different target groups have been advanced and added by a sanitary bulletin for IMCI, two television ads special informational materials for NGO. The target groups added with: NGOs working with children, teenagers, and women; Organizations of the National center of healthy lifestyle; Mass-media at a level of the Ministry of culture and information.

The following resources of the government system were used in the national communication efforts:

- All facilities of PHC organizations in the 14 Oblasts of Kazakhstan through the respective Oblast administration of public health services under the Ministry of Health were provided with special methodical manuals to be used in PHC facilities for prevention of iodine deficiency related diseases. The educational material along with promotional posters on the benefits of iodized salt use was distributed among PHC organizations of cities, small settlements and paramedic stations of rural areas all over the country
- In 2003, the National Centre for Promotion of Healthy Lifestyles conducted national cascade training of 1,200 PHC-level medical professionals on the subject of prevention of iodine deficiency with the use of iodized salt, and thereafter included the subject in the permanent in-service training plan of the Centre since 2004
- All divisions of the school educational system in the 14 Oblasts of Kazakhstan were provided with special methodical manuals on prevention of IDD with the use of iodized salt. The manuals were presented to the teachers of state comprehensive schools through the Departments of Education of the Ministry of Science and Education. The information materials along with rapid test kits for checking of iodized salt was delivered to the state comprehensive schools of cities, small settlements and rural areas all over the country
- All Divisions of the Sanitary-Epidemiologic Services (SES) in the 14 Oblasts of Kazakhstan were provided with special methodical manuals[13]. The methodical manuals are approved by

[12] Kulmurzaeva LR, Tsoj IG, Tolysbaeva ZT, Kasenova KT. Short-term monitoring of communication actions on a problem iron deficient anemia and iodine deficiency disorders in pilot regions. Health and Illness, Almaty, 2004, (35), 75-79

[13] Tsoj IG, Ospanova FE. Iodized salt in Kazakhstan. Monitoring, quality control, Almaty, 2003

the Department of Medical Science, Education and Development of Medicine and International Relations of the Ministry of Health and designed for health governmental agencies providing quality control of foods and raw food stuff, iodized salt production and distribution enterprises; and also for NGOs agencies and individuals forming national policy on elimination and preventive treatment of iodine deficiency related diseases

- The Commissions on Family Affairs and Gender Policy under the President of the Republic of Kazakhstan joined the implementation of the national communication strategy
- In 2003-2006, republican and regional state information TV channels under support of the Ministry of Information and Culture within the framework of the governmental order (Public Service Announcements) showed advertising video clips on the necessity of iodized salt consumption
- In 2003-2007, republican state information TV channels released specialized programmes on reduction of iodine deficiency in their programmes devoted to health problems.

The following resources of NGO systems were used in the national communications efforts:

- Public organizations of Kazakhstan joined the work in 2003-2006 through NGOs incorporated in the Confederation of NGOs (CNOK). In 2003, all Oblasts, except West-Kazakhstan were provided with specially designed packages including 12 types of information materials (leaflets, brochures, booklets, posters, advertising video clips, etc.) on prevention of iodine deficiency and advantage of iodized salt consumption. In 2006, all Oblasts of Kazakhstan through the CNOK confederation were provided with 7 types of information materials (leaflets, brochures, booklets, posters, advertising video clips, etc.) on the benefits of iodized salt consumption. In their communication work with large groups of the population, NGOs use various methodologies and channels such as meetings, seminars, assemblies, slide presentations, mass-media performances, advertising rallies and actions, drawing competitions, musical rock-concerts, KVN quizzes, class hours and competitions at schools, universities and colleges, mass holidays fairs, and mass spot-checks on identifying fortified food products in local market system. The confederation of NGOs (CNOK) directed the efforts to perfection of activity of the specially created coordination councils on social issues under oblast administration authorities (Akimats), resulting in development of further cooperation of NGOs with administration authorities, Centres of Healthy Lifestyle and trading organizations
- In 2003-2007, the republican and local oblast, and private TV channels contributed to highlighting the iodine deficiency reduction issue through specialized author's programmes making it on a regular basis.

The national communication efforts have been conducted in close collaboration with ADB-JFPR supported projects "Improved Nutrition of Poor Mothers and Children in Asian Countries in Transition" and its follow-up project "Sustainable Food Fortification in Central Asia and Mongolia". UNICEF mainly supported the execution of IDD prevention actions while ADB took main responsibility for facilitating national flour fortification. Results of this collaboration were the successful execution of the IDD and IDA prevention communication campaign and the establishment of an Alliance on Food Fortification with participation of various concerned Ministries, Parliament, producers and NGOs.

A Technical Assistance & Implementation Group (TAIG) was established to support the IDD prevention communication campaign. This group includes representatives of the Kazakh Academy of Nutrition, the Ministry of Health, the Ministry of Information and Culture, the Ministry of Education and Science, salt and flour producers, the NGO Confederation of Kazakhstan, ADB, CDC, USAID and UNICEF as well as representatives from PR Companies. Also, a National Steering Committee (SC) was established as a body to oversee and guide the food fortification projects. The SC was formed to ensure that all the partners are included in the process, as well as to

secure the long-term structural reforms to be consecutive towards sustainability. The Steering Committee is chaired by the Ministry of Health and consists of representatives from the Parliament, the Presidential Administration, the Prime Minister Cabinet, the Ministry of Economy, the Ministry of Agriculture, the Ministry of Education and Science, the Ministry of Information, the Ministry of Social Protection, KAN, NGOs Confederation and salt and flour producers.

An assessment of outcomes from the national education and advertising efforts was performed by a rapid survey "Rapid assessment of IDD campaign". The survey of 1,500 households in five regions of Kazakhstan was completed in August - December 2004 by the Kazakh Academy of Nutrition with financial support of UNICEF[14]. In summary the following were key results:

- 75 percent of the population knew about the presence of iodine deficiency in the country and among them, 83 percent of the population was informed of the opportunity of IDD prevention
- Knowledge of the consequences of iodine deficiency were no longer limited to goiter and thyroid gland diseases as in 2001; now, 25 percent of respondents specified reduction in intellectual development, memory impairment and "intellectual backwardness in children"
- 73 percent of the adult population interviewed identified iodized salt as an effective means against IDD; whereas in 2001-2002, only 20 percent of respondents gave this answer
- 94 percent of respondents had heard about iodized salt. Consumer demand for iodized salt was high: 90 percent of the population interviewed had already developed a habit of buying iodized salt
- Channels cited for the education of the population about benefits of iodized salt were: TV (60 percent), medical workers (32 percent), school (39 percent), newspapers (27 percent), family members (10 percent);
- 55 percent of the population recalled seeing a TV program about benefits of iodized salt consumption
- Assessment of recognition level of the iodized salt logo "Healthy food/Sapaly azdyk" revealed that, on the average 23 percent of the respondents saw this logo and 22 percent knew what it meant
- As a whole, 83 percent of households in Kazakhstan at that time used iodized salt, in comparison with the data of 1999, where the rate of consumption was 29 percent.

Lessons learned of executing the communication efforts included: Education of politicians advanced the acceptance to enact legislative acts on IDD prevention. Education and training of salt industry employees raised the motivation to manufacture and quality assure iodized salt at production. Education of supervising bodies SES and customhouses has permitted to adjust the official control system to also include the importation of iodized salt. An involvement into the communication campaign of those trained on NGO theme has allowed to actively involve 5 million citizens of Kazakhstan into educational process.

7. Involvement of the Public Sector in the Food Market

All the salt available for human consumption in Kazakhstan is being iodized. As a result, in instances where the State or lower levels of Government is involved in overseeing or providing foods for the consumption of its citizens in special institutions and/or large catering organizations, the only salt being used is iodized salt (Orphanages, Boarding schools, Hospitals, Army barracks, and so on).

8. Food Fortification Programming and Pilot Surveys

[14] Van der Haar F, Sharmanov TS, Tsoj IG, Kulmurzaeva LR, Ospanova FE. Estimation of adequacy of iodized salt and its consumption in Kazakhstan, UNICEF, Almaty, 2005

From the early start in salt iodization prior to the year 2000, Kazakhstan has continued tackling the issues concerning the fortification of common foodstuffs in a collaborative manner with nearby countries in the sub-region. At the Almaty Forum in October 2001, multi-sector delegations led by high-level Government officials of Central Asian countries entered into a landmark agreement to boost the production and consumption not only of iodized salt but also fortified wheat flour. These efforts became backed by a partnership of international support organizations that included the Asian Development Bank (ADB) together with UNICEF the Kazakh Academy of Nutrition. Two successive grants from the Japan Fund for Poverty Reduction (JFPR) managed through ADB for this sub-regional initiative have been key contributions during the 5 years since the Almaty Forum in raising the proportion of rolled-milled wheat fortified with a regionally agreed-upon mixture of vitamins and minerals, named KAP Complex, including iron and folic acid.

During 2004, the Parliament of Kazakhstan in 2004 passed a Law on Mandatory Flour Fortification, starting with all the roller mills in Kazakhstan by July 2006. This was followed by the elaboration and Government enactment by decree or technical regulation of the standards and conduct of flour production and sales, premix, and bakery products. On average from January 2005 to September 2006, nine to 13 large roller mills have been fortifying their flour production, together meeting 62% of the overall consolidated flour production in large roller mills in Kazakhstan during 2006 (13.6% of the total flour consumption). The League of Grain Producers and Bakers in Kazakhstan (LGPBK), with President Evgeniy Ghan, is an active lead partner in extending the fortification to an ever larger numbers of flour mills and developing nutritionally desirable, practically attainable norms and standards for milling performance and product composition.

An issue that seriously started threatening the achievements in Kazakhstan has been building during the same year 2006. Triggered by the political desire to join the World Trade Organization (WTO), the entire legal edifice of Kazakhstan has been put under revision with the overall aim to align it better to accepted practices in the European Union. The Ministry of Agriculture, the designated authority for developing a new Law on Food Safety, has together with the Ministry of Industry and Trade persistently refused to incorporate a clause on mandatory flour fortification in a new food safety law proposal. The leading partners in Kazakhstan, on the other hand, worked together closely with like-minded Parliamentarians to ensure that the law proposal would keep including the clause on mandatory flour fortification. A Food Safety Law proposal, including the clause, passed with majority vote in Parliament in June 2007, but then became vetoed by the President of Kazakhstan.

After the veto, the President's Office called on the three concerned Ministries to exactly consolidate their positions on flour fortification and proceed on priority with formulating a new Food Safety Law proposal with the Ministry of Agriculture in the lead. Importantly, the President's Office also charged the Ministry of Health with drafting a law on the prevention of iron deficiency anemia which should contain the contested clause on mandatory flour fortification. A drafting Committee, which includes officials of the Ministry of Health, the Ministry of Agriculture and the LGPBK has plans to submit a draft to Parliament for the new session after the general Parliamentary elections in August 2007.

The Kazakh Academy of Nutrition has taken the lead in the formulation of a proposed National Programme of Food Fortification in the Republic of Kazakhstan along the official guideline named "Rules for Development of Programmes in the Republic of Kazakhstan" endorsed by Decision of the Government № 789 of 25 June 2001. The proposal calls for a medium-term programme that supports inter-sector and inter-department collaboration at the national level to organize sustained industrial production of fortified (enriched) foodstuffs in the food production enterprises for the prevention of the most widespread micronutrient deficiencies and alimentary-dependent diseases.

The programme document provides the substantive objective justification for its implementation on basis of the specific features of micronutrient deficiencies prevalent in Kazakhstan, the established principles of food fortification by micronutrients and the benefits of fortified foods for society, and it outlines the specific objectives, the principles of successful implementation and the directions and mechanisms of execution. The proposal is accompanied by a plan of action, and financial projections of program expenditure as well as economic returns. The proposal is being circulated among the interested departments and organizations for their comments prior to submission.

A number of researches and surveys, carried out in the past, contribute to the starting point for development of the proposed national program. To illustrate, the assessment of the situation with respect to the consumption and acceptance of iodized salt in the population is based on the following series of studies and surveys:

- "Medical demographic studies in Kazakhstan" under financial and technical support of "Macro International, Inc." (USA), 1999 (contractor – Kazakh Academy of Nutrition);
- "Study of knowledge and skills level regarding the issue of iodine deficiency among the population and medical professionals" under financial and technical support of UNICEF, 2001-2002 (contractor – National Center on generation of Healthy Lifestyle of the MoH of the RoK); Regional pilot monitoring of iodized salt consumption level was carried out in the southern region within the framework of the communication section of the project JFPR 9005 ADB in households of the Shymkent city and the Sairam district of the South-Kazakhstan oblast, 2003 (contractor – Kazakh Academy of Nutrition);
- "Assessment of the adequacy of iodized salt and its consumption in Kazakhstan" under financial and technical support of UNICEF, 2004 (contractor – Kazakh Academy of Nutrition), and
- "MICS – survey carried out including multiple parameters with application of cluster sampling" under financial and technical support of UNICEF, 2006 (contractors – Kazakh Academy of Nutrition and Agency on Statistics of the Republic of Kazakhstan).

9. Financial Obligations of the State

The State Program "Health of the People", endorsed by Government Decision № 289, dated 21 March 2003, did not reserve funding from either the national or local budgets. The description above on Inspection and Control and Government Administration, however, demonstrate that convenient and durable ways of financing can be constructed on basis of decisions within and among Ministries.

The Presidential Decree № 1438 "On the State Program for Public Health Services Reform and Development 2005-2010", dated 13 September 2004, was followed by an Order of the Ministry of Health № 637, dated 23 December 2005 on "List of Diseases and Categories of the Population, the outpatient treatment of which is supported with free-of-charge medicines and specialized dietetic therapy that are prescribed under favourable conditions". The Order provides for the entitlement of pregnant women and children under two years old to State-financed iodine supplements for the years until 2010. The expenses for these supplies are to be compensated from the local health budgets.

The Ministry of Culture and Information has placed video and radio reels on the State TV and radio channels as a state social order from their own budget.

10. Database Establishment

As described in the sub-chapter on Food Inspection and Control, the State SES has been tasked to carry out regular inspections of iodized salt quality at various stages of exchange between production and consumption. This is consolidated in quarterly reports to the Republican SES and entered in a national database maintained by the Chief Health Inspector. Table B.1 illustrates the results of the

quarterly reports for the past years. In addition, the Agency on Statistics will include the data of production and import of iodized salt in the Statistical Classification of industrial products, thus contributing to a permanent system of overseeing the supply of iodized salt in the population.

Data on the morbidity of the population classified by certain groups of illnesses, including "endocrine diseases, dietary disorders and metabolic diseases" are being collected by the Ministry of Health since several years. In 2005, the reported total morbidity of endocrine diseases comprised 3,298 per 100,000 people; children's morbidity of the same group of diseases comprised 1,417 per 100,000 children or 52,743 cases in absolute numbers.

Using the reports on "endocrine diseases, dietary disorders and metabolic diseases", however, it is difficult to specifically distinguish iodine deficiency disorders. For more precise tracking of iodine deficiency disorders only and the possible effect of iodized salt consumption and other methods of IDD prevention, the Ministry of Health in 2006 introduced a statistical report form for registration of cases diagnosed with hypothyroidism and thyrotoxicosis (hyperthyroidism) with and without goiter. In the special statistical annual of the Ministry of Health, registered hypothyroidism and thyrotoxicosis cases with and without goiter as well as registered new cases with the same diseases registered per 100,000 population will be recorded from 2007 onward. Tables B.2 and B.3 present the illustrative statistics on these illnesses for 2006.

Table B.2. Clinical case registration (total numbers) in the Republic of Kazakhstan, 2006

Oblasts	**Hypothyroidism**							
	Total		**Adults**		**Adolescents**		**Children**	
	Total	**For the first time**	**Total**	**For the first time**	**Total**	**For the first time**	**Total**	**For the first time**
Republic of Kazakhstan	**15,165**	**3,610**	**12,137**	**2,386**	**1,034**	**375**	**1,994**	**849**
Akmola	975	203	922	189	23	9	30	5
Aktobe	448	100	342	59	24	16	82	25
Almaty	857	278	719	195	40	26	98	57
Atyrau	852	160	636	55	183	98	33	7
E Kazakhstan	1,103	179	913	114	69	15	121	50
Zhambyl	613	221	456	111	33	12	124	98
W Kazakhstan	510	131	446	93	41	28	23	10
Karaganda	2,606	697	1,832	337	17	48	587	312
Kyzyl-Orda	363	96	266	54	26	9	71	33
Kostanay	511	76	437	56	53	14	21	6
Mangystau	169	25	162	22	1	1	6	2
Pavlodar	549	138	441	95	31	16	77	27
N Kazakhstan	927	101	777	71	60	7	90	23
S Kazakhstan	2,532	725	1,974	587	197	54	361	84
Astana City	1,009	147	971	141	6	1	32	5
Almaty City	1,141	333	843	207	60	21	238	105

Oblasts	**Thyrotoxicosis with and without goiter**							
	Total		**Adults**		**Adolescents**		**Children**	
	Total	**For the first time**	**Total**	**For the first time**	**Total**	**For the first time**	**Total**	**For the first time**
Republic of Kazakhstan	**30,626**	**6,553**	**25,319**	**4,685**	**1,859**	**651**	**3,448**	**1217**
Akmola	1,215	188	1,067	157	74	19	74	12
Aktobe	1,357	250	1,082	193	67	16	208	41
Almaty	4,421	1,259	3,782	923	242	108	397	228
Atyrau	1,928	417	1,371	234	189	59	368	124
E Kazakhstan	2,529	458	2,089	338	94	48	346	72
Zhambyl	1,179	266	1,032	206	37	9	110	51
W Kazakhstan	972	140	936	120	28	15	8	5
Karaganda	1,859	295	1,664	234	65	22	130	39

Kyzyl-Orda	2,192	509	1,705	343	129	51	358	115
Kostanay	796	173	679	129	93	27	24	17
Mangystau	1,302	549	1,163	494	85	38	54	17
Pavlodar	1,298	341	1,106	249	94	33	98	59
N Kazakhstan	1,315	233	1,120	152	68	4	127	77
S Kazakhstan	6,391	994	4,730	462	531	181	1,130	351
Astana City	713	156	697	150	5	1	11	5
Almaty City	1,159	325	1,096	301	58	20	5	4

Table B.3: New clinical case registration (per 100,000 of the respective population) in the Republic of Kazakhstan, 2006

Oblasts	**Hypothyroidism**							
	Total		**Adults**		**Adolescents**		**Children**	
	Absolute number	**Per 100,000**	**Absolute number**	**Per 100,000**	**Absolute number**	**Per 100,000**	**Absolute number**	**Per 100,000**
Republic of Kazakhstan	**3,610**	**23.6**	**2,386**	**22.3**	**375**	**40.7**	**849**	**23.0**
Akmola	203	27.1	189	35.2	9	19.1	5	3.0
Aktobe	100	14.5	59	12.4	16	35.4	25	14.1
Almaty	278	17.2	195	17.6	26	24.6	57	14.3
Atyrau	160	33.6	55	17.8	98	300.6	7	5.2
E_Kazakhstan	179	12.5	114	10.7	15	18.2	50	17.8
Zhambyl	221	22.0	111	16.9	12	18.3	98	34.8
W Kazakhstan	131	21.4	93	21.4	28	72.9	10	7.2
Karaganda	697	52.1	337	34.2	48	63.4	312	113.1
Kyzyl-Orda	96	15.4	54	14.0	9	21.4	33	16.9
Kostanay	76	8.4	56	8.3	14	27.0	6	3.4
Mangystau	25	6.5	22	9.1	1	4.1	2	1.7
Pavlodar	138	18.6	95	17.1	16	37.0	27	18.6
N Kazakhstan	101	15.3	71	14.4	7	18.0	23	17.7
S Kazakhstan	725	32.1	587	43.1	54	35.4	84	11.3
Astana City	147	26.1	141	31.9	1	4.8	5	5.0
Almaty City	333	26.3	207	21.2	21	37.4	105	44.3

Oblasts	**Thyrotoxicosis with and without goiter**							
	Total		**Adults**		**Adolescents**		**Children**	
	Absolute number	**Per 100,000**	**Absolute number**	**Per 100,000**	**Absolute number**	**Per 100,000**	**Absolute number**	**Per 100,000**
Republic of Kazakhstan	**6,553**	**42.8**	**4,685**	**43.8**	**651**	**70.6**	**1,217**	**33.0**
Akmola	188	25.1	157	29.3	19	40.4	12	7.3
Aktobe	250	36.2	193	40.7	16	35.4	41	23.9
Almaty	1,259	78.1	923	83.4	108	102.3	228	57.1
Atyrau	417	87.5	234	75.9	59	181.0	124	91.4
E Kazakhstan	458	32.1	338	31.7	48	58.3	72	25.7
Zhambyl	266	26.5	206	31.3	9	13.8	51	18.1
W Kazakhstan	140	22.9	120	27.6	15	39.1	5	3.6
Karaganda	295	22.1	234	23.7	22	29.1	39	14.1
Kyzyl-Orda	509	81.9	343	89.2	51	121.4	115	58.9
Kostanay	173	19.2	129	19.1	27	52.0	17	9.7
Mangystau	549	143.5	494	203.5	38	155.1	17	14.8
Pavlodar	341	45.8	249	44.8	33	76.4	59	40.7
N Kazakhstan	233	35.2	152	30.8	4	10.3	77	59.4
S Kazakhstan	994	44.0	462	33.9	181	118.6	351	47.2
Astana City	156	27.7	150	34.0	1	4.8	5	5.0
Almaty City	325	25.6	301	30.9	20	35.7	4	1.7

The data in Tables B.2 and B.3 are given as an illustration of recently initiated data collection. It is not believed that these numbers reflect the true and full picture of IDD morbidity, since the low

morbidities are influenced by the health-seeking behavior of patients and the limited familiarity of clinicians with the new reporting procedure.

On iodine nutrition status, regular laboratory data on urinary iodine in women of reproductive age is being envisaged to be carried out once a year by the Kazakh Academy of Nutrition as an applied research initiative financed by the Ministry of Health. This position is reflected in a plan of action on universal salt iodization in the final tables part E. The Kazakh Academy of Nutrition will report results of such biological monitoring to the Committee of SES under the Ministry of Health, as the IDD control database holder.

The establishment of a network of regional centers for screening of congenital developmental anomalies, including congenital hypothyroidism, is being discussed in the Ministry of Health. In Almaty City, the Scientific Centre of Obstetrics, Gynaecology and Prenatal Medicine at this time covers some 300,000 childbirths/y and provides neonatal screening a drop of blood obtained from a heel prick of a newborn on a special filter paper for determination of TSH, PKU, etc. The necessary material and technical basis including a laboratory and trained staff is available in the country. There are functional centres of genetic screening: For example, in 2006, six regional centres were operated in large cities: Almaty, Astana, Pavlodar, Karaganda, Aktobe and Shymkent. The above mentioned Scientific Centre of Obstetrics, Gynaecology and Prenatal Medicine in Almaty City may become a body for the creation of a database on neonatal monitoring in the Republic of Kazakhstan.

11. International Collaboration

Technical and informational support, training seminars, workshops and so on have been provided on the part of international organizations UNICEF, ADB, CDC, ICCIDD, WHO, United Nations University and Emory University (USA). As a result, a system of mutual cooperation and partnership in the Republic of Kazakhstan has been established, and progress toward universal salt iodization achieved.

Kazakh scientists are involved in international work also. For example, Researchers of the Kazakh Academy of Nutrition perform sentinel studies in neighboring countries in the context of the ADB-JFPR projects on food fortification. Another example is the effort of providing external quality assurance and technical trouble-shooting support from the iodine Laboratory of the Kazakh Academy of Nutrition. Personnel of the Ministry of Health (JFPR-supported) have delivered presentations at the 1st Eurasia District of Milling industry in Istanbul, Turkey, 2006. The President of the League of Grain Millers and Bread Bakeries received a special award from FFI and was elected 1st Chairman of the Eurasia Millers District at that time.

C. Household Access and Iodine Nutrition

Three national, household-based iodine deficiency surveys have been conducted since Independence to assess changes in the use and adequacy of iodized household salt and the associated development of the iodine nutrition status in the Kazakh population. The Kazakh Academy of Nutrition provided technical leadership in each survey. The first took place in 1999, providing a baseline for future reference. The survey employed a region-wise design and was executed as an integral part of the large-scale Demographic & Health Survey. The second survey in 2004 employed the same basic design as previously and was conducted with the purpose to assess the use and adequacy of iodized salt in households of Kazakhstan 5 years after the baseline. The third survey was carried out in late spring of 2006 and used a more detailed design, patterned after the Multiple Indicator Cluster Survey which had been executed a few months earlier by the Kazakh National Statistics Agency.

This chapter summarizes in the 1st section the progress made during the past years toward adequate supplies of dietary iodized salt in households and realizing sufficient population iodine nutrition. The 2nd section analyzes the evidence that the salt iodization practices of Kazakhstan are successful for achieving adequate iodine nutrition. Conclusions are offered in the 3rd section of this chapter.

1. Evidence of Progress in Iodine Consumption and Iodine Nutrition Status

1.1 The iodine consumption and status baseline survey of 1999

During 1999, within the Demographic Health Survey, the Kazakh Academy of Nutrition performed a special study of the urinary iodine concentration (UIC) among women aged 15 to 49 year, irrespective of pregnancy status. The DHS used a two-stage stratified design for the selection of 6 regions, 251 clusters and 25 households in each cluster, resulting in ±6,300 households in the final database. Regions were constructed by the allocation of Oblasts and administrative units in Kazakhstan as follows:

- Almaty City
- North (Akmola, Kostanay, Pavlodar and North-Kazakhstan Oblasts)
- East (East-Kazakhstan Oblast)
- South (Almaty, Zhambyl, South-Kazakhstan and Kzylorda Oblasts)
- West (Aktobe, Atyrau, Mangistau and West-Kazakhstan Oblasts), and
- Central (Karaganda Oblast)

The results of the special UIC study, which covered a systematic sub-sample of one in five of the nearly 4,800 women in the DHS sample, are summarized in Table C.1, together with the presence of iodized salt in the households as assessed by rapid test kits during the DHS. In 1999, the median urinary iodine concentration (UIC) in adult women was 95µg/L, with 53 percent of the values <100µg/L, 24 percent <50µg/L and 6 percent <20µg/L, indicating that the population was iodine deficient. Only 29 percent of the households used iodized salt and some salt (5.5%) at that time was iodized with potassium iodide.

Table C.1: Use of Iodized Salt in Households and Urinary Iodine Concentration in Women of Reproductive Age, Kazakhstan DHS, 1999

Region	**Percent Households with Iodized Salt**		**Urinary Iodine Concentration in Women of Reproductive Age (µg/L)**			
	Iodate only	All iodized salt	Median	% below 20	% below 50	% below 100
North	30.5	34.0	77	12.5	34.1	60.7
East	12.7	21.6	72	7.8	26.8	65.4
South	20.9	24.5	79	7.9	32.6	59.0
West	21.8	25.5	76	4.7	29.9	61.2
Central	43.0	48.2	157	0.5	4.7	25.7
Almaty city	4.2	24.2	97	3.7	18.4	52.2
Total	**23.5**	**29.0**	**95**	**6**	**24**	**53**

1.2 The rapid assessment survey of household salt in 2004

Like for the DHS in 1999, the primary sampling units for a rapid assessment survey carried out in August – December 2004 consisted of households. Regional classes were constructed in the same way as was done in 1999. In each region except Almaty City, 1 urban and 1 rural settlement were selected randomly, followed by a random selection of 2.5 clusters (selection areas) in each settlement, and systematic canvassing of 50 households in each cluster. The sample in Almaty City consisted of 5 clusters sampled randomly each with 50 households. Thus, the total household count in the design was 1,500: 6 regions x 5 clusters = 30 clusters -17.5 urban and 12.5 rural – x 50 = 1,500 households),

while the realized sample size was 1,486. Field teams worked with district nurses of out-patient health care clinics to identify and invite households and the recruitment of households was generally continued until the required number of responsive households was fulfilled.

In the households, the salt used for meal preparation was assessed by rapid spot-testing with MBI test kits purchased through UNICEF that were manufactured for visual detection of the potassium iodinate content at the internationally agreed-upon threshold for adequacy of 15ppm. A selection of 501 salt samples that tested above this threshold in the households was collected for measurement by titration in the iodine laboratory of the Kazakh Academy of Nutrition. The laboratory had started participating at that time in the CDC-supported IRLI network of iodine laboratories. The results of salt titration measurements showed that none of the collected household salt samples were iodized below 15mg/kg.

The survey results revealed distinct patterns of household iodized salt adequacy and use among the different regions of Kazakhstan, related to the supply sources and proximity, and their wholesale/retail outlets in the regional markets. Salt stored unpacked in the households (Figure C.1) was most prevalent overall and it was the dominant share of household salt in the east and north regions, and interestingly, Almaty city.

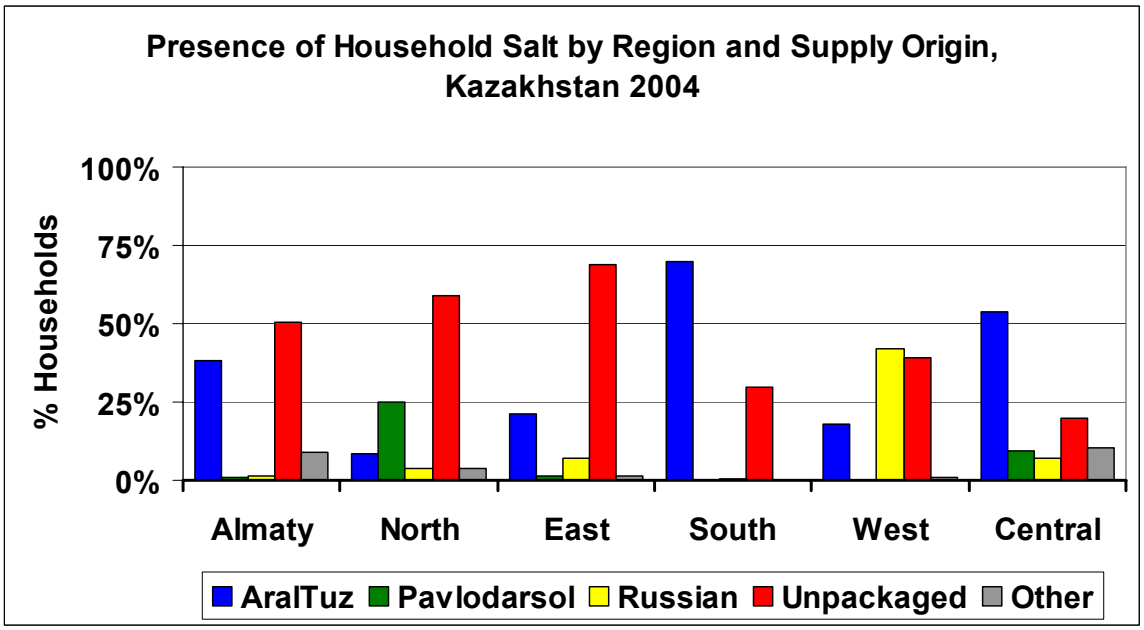


Figure C.1: Household Salt Supply Sources, Kazakhstan 2004

The AralTuz Company was the major domestic source and its salt was dominant in the south and central regions, and in Almaty city. Salt from Pavlodarsol Company was mainly present in the north and central regions, while in the west of Kazakhstan, salt imported from Russia was the major source.

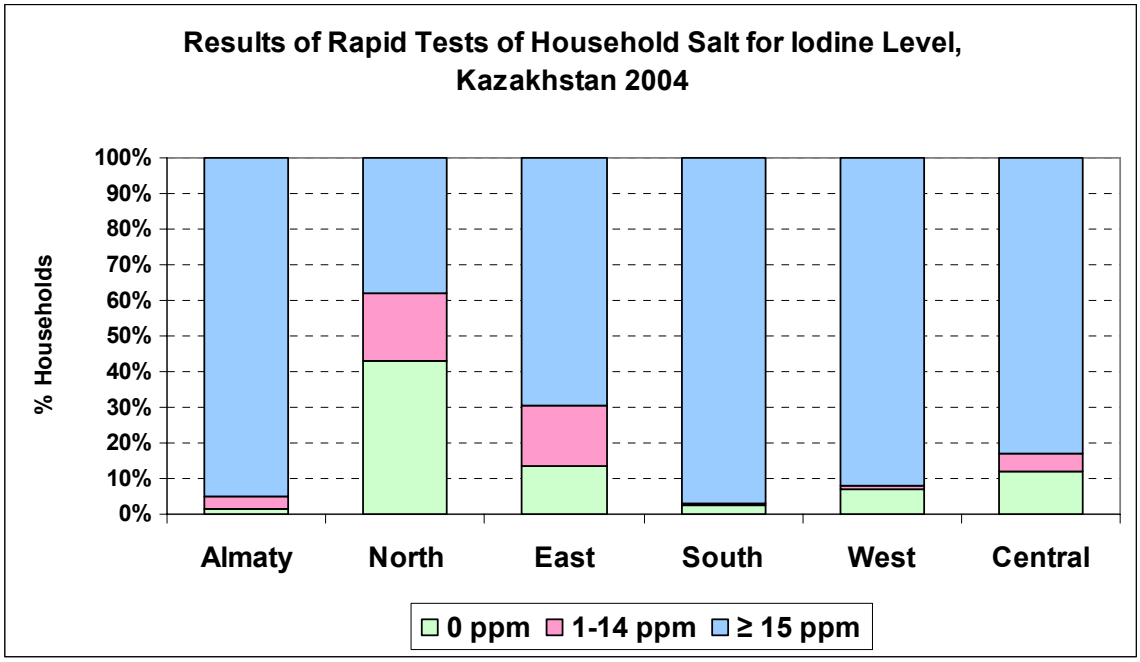


Figure C.2: Use of Iodized Salt in Households by Region, Kazakhstan 2004

Significant differences were observed in the adequacy of iodized household salt between regions (Figure C.2), varying from >90 percent in Almaty city and the south and west regions, to approx. 80 percent in the center, 70 percent in the east and only 40 percent in the north. The share of household salt not iodized varied conversely, from around 1 – 3 percent in Almaty city and south region to a high of 43 percent in the north region. The differences in adequacy of iodized salt between urban and rural households were comparatively small, except in the north region.

Like production origin, the habit of storing salt unpacked in the household was a factor that explained the variations in adequacy of iodized salt in the household. Branded salt (i.e., salt purchased and stored in its package) generally appeared to be better and more frequently well iodized than unpackaged salt. Salt supplied from AralTuz Company and from Russia (Iletskaya) was almost always well iodized. Although branded salt supplied by Pavlodarsol Company was infrequent in the overall national scheme, it was a major source of inadequately and non-iodized salt in the north and, likely, the central region.

1.3 The National Micronutrient Survey in 2006

The National Micronutrient Survey (NMS) in 2006 was carried out in association with the MICS. Overall, the MICS aimed at obtaining information on a wide array of indicators of the situation of children and women in Kazakhstan and was executed from January to March 2006 under overall responsibility of the Kazakh State Statistics Agency. The sample size of households was calculated to provide accurate national estimates, as well as estimates for urban and rural areas and 16 regions – 14 Oblasts (Provinces) and 2 cities. The MICS design consisted of a stratified two-stage sample of households, with regions as the main sampling domain for distribution of 625 clusters proportionate to the population sizes in urban and rural areas of each region. At the second stage, 24 households were obtained in each cluster, thereby yielding a variable number of households in each region. The final sample was not self-weighting and, therefore, sample weights were developed for national, regional and residential area estimates. Interviews were successful in 14,546 households and complete questionnaires were obtained of 14,570 women aged 15-49y, a response rate of 96.2 percent.

Table C.2: Percentage of Households Using Adequately Iodized Salt, MICS Kazakhstan, 2006*					
	Number of households	Number of households in which salt was	Percent of households with		
Region	interviewed	tested	No salt	< 15 PPM	15+ PPM
Akmola	879	879	0.2	15.9	83.9
Aktobe	629	626	0.2	8.6	91.2
Almaty	1,352	1,332	0.1	0.2	99.7
Atyrau	334	334	0.0	13.0	87.0
W Kazakhstan	600	600	0.0	9.5	90.5
Zhambyl	834	821	0.6	8.2	91.2
Karaganda	1,614	1,614	0.6	9.9	89.5
Kostanai	1,170	1,168	0.2	1.5	98.3
Kzyl-Orda	409	409	0.0	5.4	94.6
Mangistau	273	273	0.2	0.4	99.5
S Kazakhstan	1,415	1,414	0.0	3.4	94.6
Pavlodar	911	909	0.1	31.6	68.3
N Kazakhstan	805	805	0.0	3.3	96.7
E Kazakhstan	1,652	1,652	0.0	7.2	92.8
Astana City	334	334	1.1	4.6	94.3
Almaty City	1,353	1,257	1.3	2.0	96.7
Kazakhstan	**14,564**	**14,426**	**0.3**	**7.7**	**92.0**

* Preliminary results

During the MICS, household salt samples were tested with a rapid test kit in 14,426 household visits. Based on these tests, 92.0 percent of the households in Kazakhstan were using adequately iodised salt (15+ PPM).

Using the established MICS framework, the NMS was conducted from March to May, 2006 (3 months later than the MICS) on a systematic sub-sample of 5,000 women (every third of the MICS households) to collect data of the food consumption frequencies, haemoglobin in blood and excretion of iodine in urine. Salt samples were collected for laboratory titration from a systematic sub-sample of 1,000 households (every fifth of the sub-sample of women). The urine and salt iodine measurements were carried out in the iodine laboratory of the Kazakh Academy of Nutrition, which had started participating successfully in the QA urinary iodine sample exchange scheme of CDC, named EQUIP[15]. Data of both the urinary iodine and the household salt iodine measurements were available of 805 women, forming the basis for the present report. Upon statistical inspection, the salt iodine data of 9 households were removed from analysis due to extreme outliers, as were the urinary iodine data of 5 women. Because of the differences in sample weightings, the results of different analyses may not always add up to the same total count.

The iodine content in household salt is slightly skewed to high values and also, the frequency distribution has a small but discernable shoulder at the low end (Figure C.3). The median salt iodine content was 25.6 mg/kg, and the distribution's inter-quartile range (IQR, the range from 25th to 75th percentile) 15.1 mg/kg. The majority (90 percent) of salt iodine contents varies between 6.2 and 48.1 mg/kg. Using the agreed-upon threshold of 15 mg/kg, 86.9 percent of the households used adequately iodized salt.

[15] The laboratory of the Kazakh Academy of Nutrition has also started recently to extend expert technical assistance to laboratories in the region under the CDC-managed IRLI program

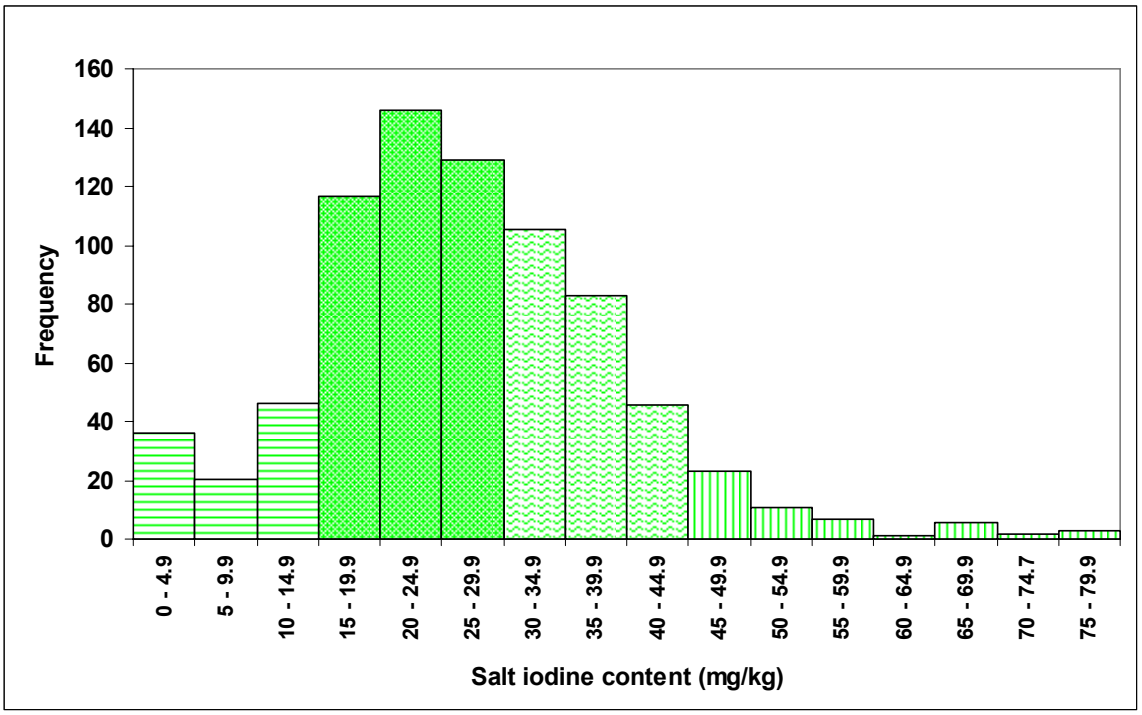


Figure C.3: Frequency Distribution of Iodine Content in Household Salt, Kazakhstan 2006

Similar to the household salt iodine content, the distribution of UIC in adult women is skewed to high values (Figure C.4). The median UIC was 249.5µg/L and IQR 195.5. The majority of UIC values vary between 45 and 577µg/L. Of all the UIC measurements, 52.1 percent were encompassed in the range of 100– 300µg/L. UIC <100µg/L was found in 13.6 percent of women, UIC <50µg/L was found in 5.1 percent, and 1.8 percent was <20µg/L.

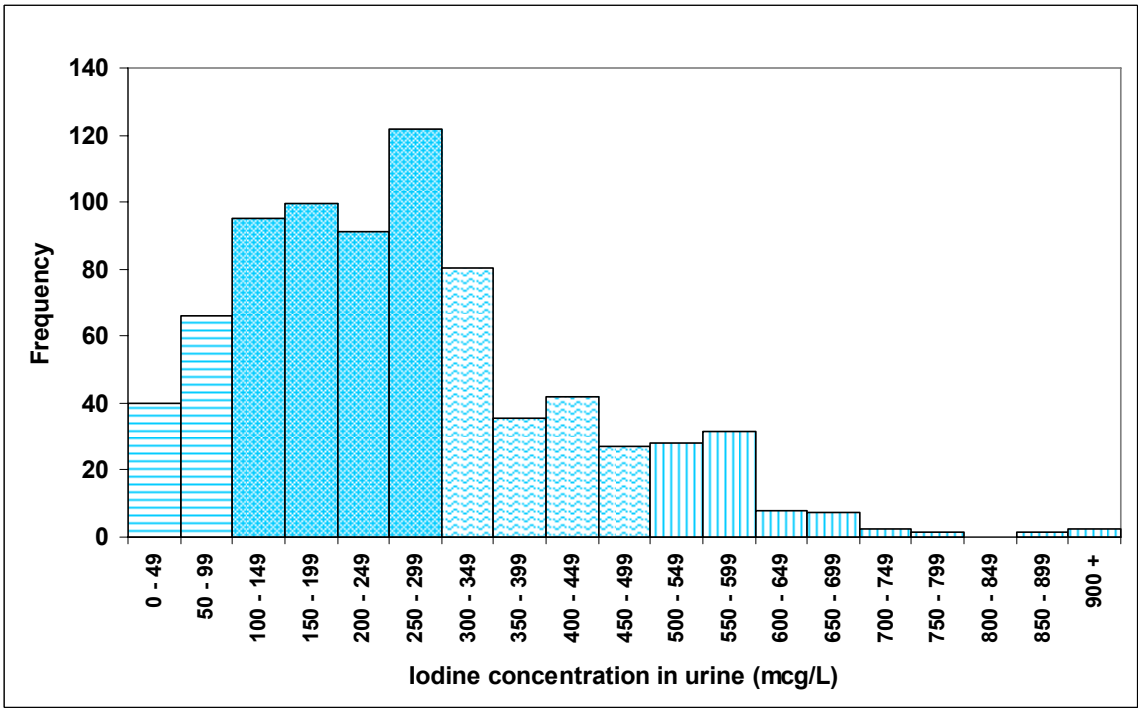


Figure C.4: Urinary Iodine Excretions in Women of Reproductive Age, Kazakhstan 2006

1.4 Assessment of Progress between 1999 and 2006

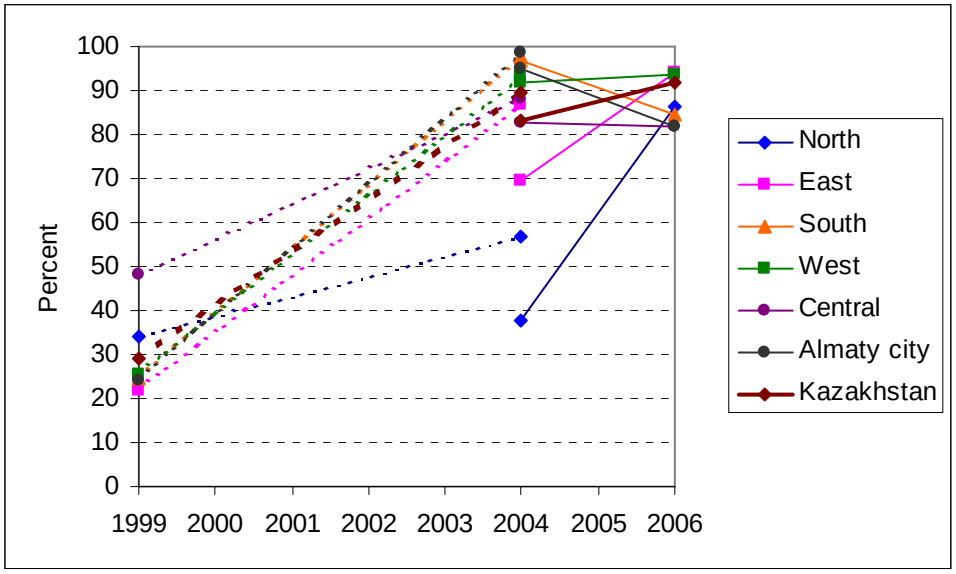


Figure C.5: Changes over Time in the Household Use of Iodized Salt in Kazakhstan

The data collection by a rapid test kit during the three national surveys of the use of iodized salt in the households permits an analysis of the change over time in the iodine consumption of the population. Figure C.5 shows the improvements in the use and quality of iodized salt observed in the households. From 1999 to 2004 (dashed lines), the salt iodine levels were assessed in terms of all iodized salt while from 2004 to 2006 (solid lines), the surveys were assessing specifically for adequately iodized salt – i.e., the salt that tested visually 15+PPM. Between 1999 and 2004, the use of iodized salt by all Kazakh households rose from 29 to 89 percent, and the coverage of households using adequately iodized salt increased from 83 to 92 percent on average in the period between 2004 and 2006. Noteworthy, the reductions in the household coverage rate in Almaty City and southern region from 2004 to 2006 were offset by the sizable increases in the household coverage rates in the northern and eastern regions over the same time.

The increases from 1999 to 2006 in the use of iodized salt by the households in each region were accompanied by changes in the fraction of low UIC values (Table C.3) among women of reproductive age. Whereas in 1999 above 50 percent of the women had UIC<100µg/L in all regions except the centre, this was no longer the case in any of the regions in 2006. The reductions in low UIC values are apparent in each region and at each cut-off point of the UIC distribution. In Kazakhstan overall, the proportion of low UIC values decreased from 53 to 14 percent at the conventional 100µg/L cut-off point, from 24 to 5 percent at 50µg/L, and from 6 to 2 percent at 20µg/L. In 2006, the highest share of UIC values <100µg/L was 22.7 percent in Almaty City, and the lowest 1.8 percent in the central region.

The coincident increases in the percent of households using iodized salt and the iodine nutrition status among women living in these households are strongly suggestive that the increased supplies of edible iodized salt are the underlying explanatory factor for the improved iodine nutrition situation in the population. Analyzing any correlations between the changes observed in iodine consumption and iodine status would not be appropriate, however, in view of the different assessment methods used in the 1999 and 2006 surveys. Moreover, the consumption and status data of 2006 were not strictly derived from the same households at the same time, but on different household samples at different time points.

Table C.3: Urinary Iodine Concentrations in 1999 (Demographic Health Survey) and 2006 (National Micronutrient Survey), Kazakhstan				
Region	**Urinary Iodine Concentrations in Women of Reproductive Age (µg/L)**			
	Year	% below 20	% below 50	% below 100
North	1999	12.5	34.1	60.7
	2006	1.1	3.8	13.3
East	1999	7.8	26.8	65.4
	2006	2.2	7.2	13.0
South	1999	7.9	32.6	59.0
	2006	3.3	8.4	16.0
West	1999	4.7	29.9	61.2
	2006	0.0	1.7	15.0
Central	1999	0.5	4.7	25.7
	2006	0.0	0.0	1.8
Almaty City	1999	3.7	18.4	52.2
	2006	4.5	9.1	22.7
Kazakhstan	**1999**	**6**	**24**	**53**
	2006	**2**	**5**	**14**

2. Evidence of Goal Achievement

The results of the National Micronutrient Survey (NMS) of 2006 are used in this sub-chapter to analyze the relationships between the adequacy of iodized salt used in the households of Kazakhstan and the urinary iodine concentrations of women aged 15 – 49 years living in these households. As described previously, the database for this analysis was constructed by a combination of 2 systematic sub-samples drawn from the established framework of the MICS. Sample weights[16] for the women in the present database were especially prepared by the Kazakh State Statistics Agency.

Table C.4: Household Salt Iodine Contents and Urinary Iodine Concentrations in Women of Reproductive Age living in these Households, Kazakhstan 2006					
Salt iodine content (mg/kg)	**Percent**		**Urinary iodine concentration (µg/L)**	**Percent**	
0	3.9%		0 - 99	13.6%	
0 - 14.9	13.1%		100 - 299	52.1%	
15 - 29.9	50.2%		300 - 499	23.6%	
30 - 45.9	30.0%		≥ 500	10.7%	
≥ 45	6.6%		Median	249.5	µg/L
Median	25.6	mg/kg	IQR	195.5	µg/L
IQR	15.1	mg/kg			

In the NMS, the iodine content in household salt was measured by titration, which permits a convenient classification in groups of women on basis of the salt iodine content in their households. The overall results of the salt iodine contents were described in section 1.3. Similarly, the UIC values of the women can be classified on basis of cut-off points established by convention for school-aged

[16] This includes the design-based weight, computed as the reciprocal of the overall probability of selection.

children. The results of the UIC measurements for the women in the present database were also described in section C.1.3. The classes used for the groups of women according to their household salt iodine contents and their UIC values are illustrated by the different bar patterns in Figures C.3 and C.4, and Table C.4 contains a summary of the overall findings for Kazakhstan on this basis.

Table C.5: Relative Risks of Low and High Urinary Iodine Concentrations in Women of Reproductive Age related to the Salt Iodine Contents in their Households, Kazakhstan 2006

Salt iodine (mg/kg)	**total n**	**n<100µg/L**	**P(UI<100)**	**Relative Risk**	**95% Confidence Interval**
0 - 14.9	103	18	18%	1.25	0.77 to 2.02
15.0-29.9	392	56	14%	1.00	**Reference**
≥30	293	33	11%	0.78	0.52 to 2.18
		n>300µg/L	**P(UI>300)**		
0 - 14.9	103	41	40%	1.18	0.89 to 1.54
15.0-29.9	392	134	34%	1.00	**Reference**
≥30	293	93	32%	0.92	0.74 to 3.96
		n>500µg/L	**P(UI>500)**		
0 - 14.9	103	10	10%	0.87	0.45 to 1.69
15.0-29.9	392	43	11%	1.00	**Reference**
30.0 - 39.9	226	29	13%	1.16	0.74 to 1.80
≥45	67	7	10%	0.93	0.43 to 1.99

Using the sample weights for women, relative risks were calculated for the proportions of UIC <100µg/L, as well as >300µg/L and >500µg/L at the above household salt iodine content ranges, with the iodine content range of 15 – 29.9mg/kg set as reference (Relative Risk 1.0). The results of these calculations are given in Table C.5. As shown by the wide 95% Confidence Intervals in each case, the use in households of iodized salt with iodine contents either below or above the reference range is not significantly related to the risk of a low (<100µg/L) or high (>300µg/L and >500µg/L) urinary iodine concentration in the women. In other words, the position of the UIC in the overall UIC distribution among adult women in Kazakhstan is not directly associated with the differences in iodine content of their household's salt.

The failure of finding a significant risk relationship for the association of urinary iodine excretion with the iodine levels in household salt does not mean that this relationship does not exist, however. The lack of a statistical association at national level in Kazakhstan is, in fact, not very surprising in view of the fact that in Kazakhstan the law mandates that all the food-grade salt, and not just the salt used by the households alone, should be iodized. Therefore, the contribution of variations in the iodine content in household salt to the overall variation in iodine consumption and, therefore, iodine excretion, will be limited.

Nevertheless, in view of the wide variations of the iodine values both in the household salt and the women's urine, and the fact that the iodine was measured in samples of salt and urine taken from the same households, a more refined analysis on basis of the data by regions was also attempted. Using the same cut-off values as before, Table C.6 shows the percent proportions of the salt and urinary iodine distributions by the 16 administrative units. Province-wise, the lowest median iodine content in household salt was found in Pavlodar province (situated in the north of Kazakhstan). Akmola province had the highest median salt iodine content, followed by Aktobe and North-Kazakhstan provinces, all situated in north Kazakhstan. Pavlodar was the province with the lowest median UIC in women of all regions. The highest median UIC was observed in Aktobe province (west of

Kazakhstan), followed by North-Kazakhstan and Almaty (south of Kazakhstan) provinces. Thus it would seem that the geographical pattern of median iodine values in household salt and adult women's urine in Kazakhstan was not entirely consistent. Nevertheless, the correlation coefficient between the median salt iodine and the median urinary iodine values was 0.47 (p=0.067), suggestive of a very weak association overall.

Table C.6: Household Salt Iodine Contents and Urinary Iodine Concentration in Women of Reproductive Age by Administrative Division, National Micronutrient Survey, Kazakhstan 2006

		Salt iodine (mg/kg)				Urinary iodine (µg/L)			
Region	n	Median	%<15	%≥30	%≥45	Median	%<100	%≥300	%≥500
Akmola	49	34.8	8.8%	59.8%	18.1%	270.2	4.7%	33.6%	9.3%
Aktobe	40	31.5	2.5%	59.4%	1.3%	315.0	3.8%	57.0%	16.4%
Almaty	89	22.7	6.6%	32.7%	11.8%	293.8	7.1%	48.9%	21.8%
Atyrau	30	26.5	13.1%	30.5%	3.1%	175.2	24.2%	9.9%	1.7%
W Kazakhstan	35	22.8	5.9%	30.3%	7.0%	229.9	13.6%	27.0%	10.8%
Zhambyl	54	19.0	30.0%	24.0%	1.0%	212.4	29.9%	30.1%	12.1%
Karaganda	92	22.6	18.3%	23.4%	4.3%	291.1	1.8%	44.3%	10.4%
Kostanai	53	27.8	12.4%	45.4%	0.0%	198.0	12.8%	33.0%	7.9%
Kzyl-Orda	32	25.7	21.7%	45.7%	19.5%	171.5	23.2%	19.9%	9.1%
Mangistau	19	25.6	6.1%	35.4%	4.9%	161.0	26.8%	13.4%	2.4%
S Kazakhstan	67	24.0	12.8%	30.3%	3.7%	249.2	13.1%	25.3%	16.6%
Pavlodar	43	16.9	33.9%	22.0%	0.0%	124.0	36.4%	14.7%	2.5%
N Kazakhstan	38	31.7	1.9%	57.0%	14.4%	298.6	0.0%	51.5%	8.9%
E Kazakhstan	87	28.4	5.8%	45.6%	7.9%	244.4	13.0%	40.0%	11.6%
Astana City	20	28.0	8.3%	44.4%	27.8%	194.5	11.1%	13.9%	2.8%
Almaty City	38	21.2	18.2%	27.3%	4.5%	198.0	22.7%	36.4%	9.1%

Table C.7: Correlation Coefficients between the Proportions of the Distributions of Household Salt Iodine Content and the Urinary Iodine Concentration in Women of Reproductive Age, Kazakhstan 2006

		Urinary iodine concentration (µg/L)		
		%<100	%≥300	%≥500
Salt iodine content (mg/kg)	%<15	0.713 (p<0.01)	-0.397	-0.243
	%≥30	-0.582 (p<0.05)	0.388	0.095
	%≥45	-0.340	-0.100	-0.097

Table C.7 shows the correlation coefficients for the proportions of low and high values in the distributions of salt iodine contents and urinary iodine concentrations by administrative unit. At the low end of the UIC distribution (<100µg/L), the correlation coefficients with the proportions of low (<15mg/kg) and high iodine content (≥30mg/kg) in household salt were statistically significant across provinces.

The core nature of this relationship is illustrated in Figure C.6. The share of low UIC values among women in the provinces increases significantly (p<0.01) with increasing proportions of low iodine content in the households' salt (<15mg/kg). As expected, the same but inverse relationship existed between the proportion of low UIC in provinces and high household salt iodine content (≥30mg/kg), although this relationship is somewhat weaker (p<0.05). It is noteworthy that similar relationships were not found at the high end (≥300 or 500µg/L) of the UIC distribution in women.

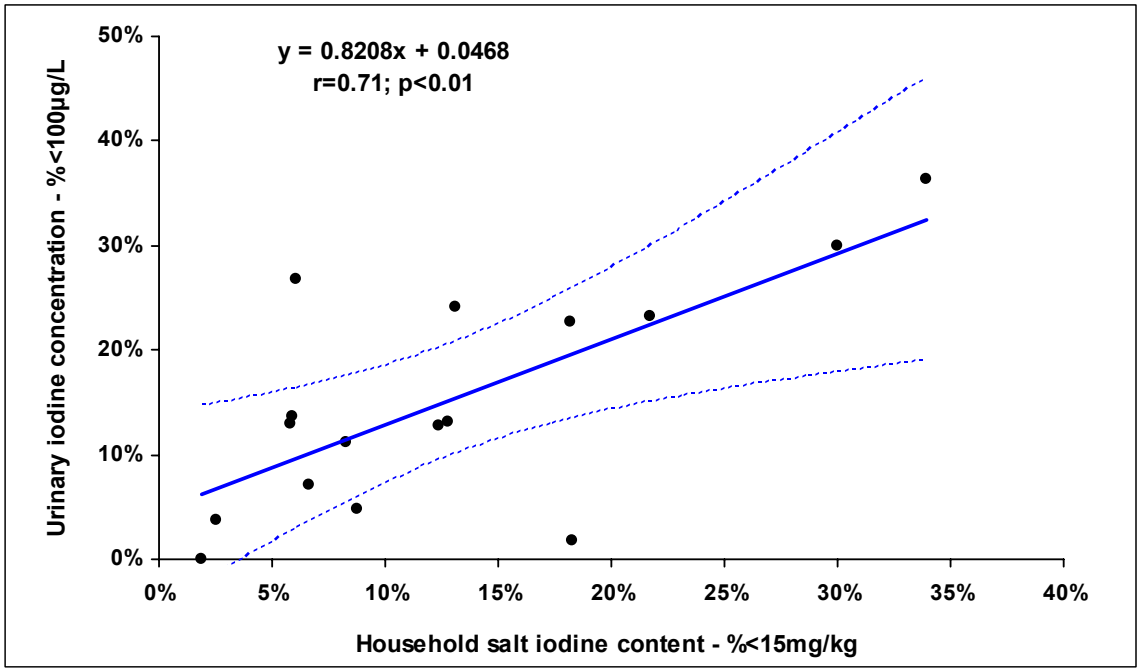


Figure C.6: Relationship between the Proportions of Low Iodine Content in Household Salt and Low Urinary Iodine Concentration in Women of Reproductive Age, Kazakhstan 2006

D. Assessment of Sustainability

1. Criteria applied to Kazakhstan

Table D.1 summarizes the current progress achieved in USI for IDD elimination in Kazakhstan, thereby providing a "situation at a glance" of the ongoing efforts and associated institutions.

Table D.1: Current Program Situation of USI for IDD elimination in Kazakhstan

A National Situation Assessment	
It is desirable to have	**Available in Kazakhstan**
Managerial personnel in ministries and government agencies	The State Sanitary-Epidemiologic Supervision Committee under the Ministry of Health of the Republic of Kazakhstan The Committee for Technical Regulation and Metrology under the Ministry of the Industry and Trade of the Republic of Kazakhstan The Committee for the Customs Control under the Ministry of Finance of the Republic of Kazakhstan Committees for social cultural development at the Parliament of the Republic of Kazakhstan The Agency on Statistics of the Republic of Kazakhstan
A National Committee	National Coordination Council on Food Fortification, chaired by the Minister of Health of the Republic of Kazakhstan National Commission for Family and Gender Policy Issues at the

	President's Office of the Republic of Kazakhstan Association of the Salt Producers of the Republic of Kazakhstan
National laws, acts, guidelines and expert opinions	▪ Law of the Republic of Kazakhstan No. 489-PZ of 10/14/2003 "On Prevention of Iodine Deficiency Disorders" ▪ Order of the Ministry of Health of the Republic of Kazakhstan No. 641 of February 8, 2002 "On Endorsement of the Rules and Procedures for Monitoring the Quality, Production, Storage, Import, and Sales of Iodine Fortified Cooking Salt and Other Foodstuffs Fortified with Iodine Compounds" ▪ Law No.361-II of February 4, 2002 "On Sanitary-and-Epidemiologic Well-Being of the Population" ▪ Law No.603-II of November 9, 2004 "On Technical Regulation" ▪ GOST interstate standard No. 13830-97 on "Dietary Cooking Salt" ▪ State Standards for iodine fortified salt, fortified wheat flour and bread products ▪ Sanitary rules and norms ▪ The Customs Code of the Republic of Kazakhstan ▪ Service Instructions for Territorial Customs Bodies on Realization of Law No 489-PZ "On Prevention of Iodine Deficiency Disorders" ▪ Expert opinions issued by the Institute of Technology. ▪ Law of the Republic of Kazakhstan "On Protection of the Rights of Consumers" (1991)
A system for inspections	Internal quality control by each manufacturer (qualitative, semi-qualitative and quantitative methodologies) External control by State and Oblast and local authorities of SES under the Ministry of Health of the Republic of Kazakhstan Customs control under the Ministry of Finance of the Republic of Kazakhstan Sales control under the Ministry of Industry and Trade of the Republic of Kazakhstan Kazakh Academy of Nutrition in cases of arbitration
A system for monitoring the adequacy of supplies	To be implemented by the SES authorities in accordance with the Order of the Ministry of Health of the Republic of Kazakhstan No. 641 of 18 August 18 2004 "On Endorsement of the Rules and Procedures for Monitoring the Quality, Production, Storage, Import and Sales of Iodine Fortified Cooking Salt and Other Foodstuffs Fortified with Iodine Compounds" Starting from 2006, the Agency on Statistics of the Republic of Kazakhstan has introduced special columns in the mandatory state statistical reporting on industrial products on the national production and supplies of iodine containing cooking salt
Government practices to promote adequate iodine nutrition	Entitlement of free-of-charge iodine supplementation to pregnant women and children under 2 year to be implemented till 2010. State Order awarded to the Kazakh Academy of Nutrition by the Ministry of Health of the Republic of Kazakhstan for conducting a survey once every 3 years

Sufficient iodized salt supplies	AralTuz company, Pavlodar Salt joint-stock company and SuzakTuz company provide 85 - 90 percent of the requirement for cooking salt in the Republic of Kazakhstan Agency on Statistics of the Republic of Kazakhstan reports on overall salt manufacture and supplies (NaCl). A special column is being inserted for national statistical reporting on production of fortified foodstuffs (iodized salt) MICS survey 2006: 92 percent of the households use adequately iodized salt Association of Salt Producers of Kazakhstan reports that supplies are sufficient for the size of the population in Kazakhstan
Wholesale and retail oversight	Salt company dealers conduct independent research of markets and competition behaviours Non-governmental organizations act as informants
Industrial salt supplies	Reports of Agency on Statistics of the Republic of Kazakhstan Association of Salt Producers of the Republic of Kazakhstan
Consumption of iodized salt by animals	According to data provided by Ministry of Agriculture of the Republic of Kazakhstan Association of Salt Producers of the Republic of Kazakhstan
Availability and purchases of KIO_3	Data reports by the Association of Salt Producers of the Republic of Kazakhstan, and L-Pharma chemical import firm obtains supplies from a reputable factory in the Russian Federation, and sells it at an affordable price in Kazakhstan to the producers
Resources to support durable iodine fortification of foods	▪ External control functions (SES under the Ministry of Health, Customs Control under the Ministry of Finance, Certification agencies under the Ministry of Industry and Trade) ▪ Reduction of customs duties on the import of measuring devices for production and control of iodized salt, according to the Decision of the Government of the Republic of Kazakhstan ▪ The Ministry of Health: Programme of Assessment of the Status of Nutrition for 2006-2007 implemented by the Kazakh Academy of Nutrition ▪ State Order awarded by the Ministry of Health to the Kazakh Academy of Nutrition for conducting national surveys on nutrition status and efficiency of actions aimed at prevention of micronutrient deficiencies (2006-2008) ▪ State Order on applied research of the Ministry of Health with frequency once in 3 years by the Kazakh Academy of Nutrition for tests of salt and urinary iodine ▪ Information support to be provided by the Ministry of Information and Culture ▪ Ministry of Health activities aimed at the creation of a National Register of Thyroid Gland Pathology with a centre to be established at the Scientific Research Institute of Cardiology and Internal Diseases under the Ministry of Health ▪ Ministry of Health activities to establish universal newborn screening, including TSH, under the Scientific Centre of Obstetrics, Gynaecology and Prenatal Medicine of Kazakhstan
Maintain awareness of the general public, mass-media	Confederation of NGOs are monitoring of household salt supplies Mass-media give regular attention to the IDD/USI situation

	National League on the Protection of the Rights of Consumers in Kazakhstan is connected
Scientific community is active	The Kazakh Academy of Nutrition performs regular surveys of the use of iodized salt in households, connected to excretion of iodine in urine Scientific Research Institute of Cardiology and Internal Diseases under the Ministry of Health is developing regular reporting of thyroid diseases Information dissemination through the National Center for Promotion of Healthy Lifestyle under the Ministry of Health The Scientific Centre of Obstetrics, Gynaecology and Prenatal Medicine of Kazakhstan is developing a network of Centers for neonatal screening Medical academies, universities and colleges have included the knowledge regarding IDD prevention into the curriculum, pre-degree and post-degree preparation
Development of a training system (including medical staff)	National Center for Promotion of Healthy Lifestyle conducts training on permanent basis at grassroots level The Almaty State Institute of Doctors Advancement (In-service training) includes the subject in their programs Faculties of improvement of professional skill in Medical Academies, Universities and Colleges have IDD prevention introduced into curriculum for pre-degree and post-degree preparation Kazakh Academy of Nutrition conducts regular training seminars and workshops Institute of Standardization and Certification at the Ministry of Industry and Trade of the Republic of Kazakhstan
Stability of communication tactics	Services provided on ongoing basis by the National Center for Promotion of Healthy Lifestyle: Regional centres, centres of health strengthening at the primary health care level The Kazakh Academy of Nutrition The Ministry of Culture and Information The Ministry of Science and Education: Implementation of IDD prevention in the educational programs of middle schools Non-governmental organizations coordinated by the KNOC.
Entities in charge of the programme of Prevention of iodine deficiency disorders	Committee of State SES, directed by the Chief Health Inspector under the Ministry of Health Coordination of Programmes for the Prevention of Micronutrient Deficiencies
National Database:	Located at the Committee for State Sanitary-Epidemiology Surveillance of the Ministry of Health, with inputs from
• iodine content in salt	- Authorities of local, provincial and state SES - Certification authorities under Ministry of Finance (Customs) and Ministry of Industries and Trade (Certificates of Conformity) - Association of Salt Producers of the Republic of Kazakhstan - Department of Treatment and Prophylactics under the Minsitry of Health
• household use of iodized salt	Kazakh Academy of Nutrition
• excretion of iodine with urine	Kazakh Academy of Nutrition

• level of neonatal TSH	Scientific Centre of Obstetrics, Gynaecology and Prenatal Medicine of Kazakhstan Centres for control over congenital thyroid insufficiency are operated in the RoK on the base of large obstetrical institutions.
▪ morbidity of hypothyroidism and thyrotoxicosis with and without goiter	Department of Treatment and Prophylactics under the Minsitry of Health Medical Statistics Annual
▪ public awareness	National Centre of PFZOZ, mass-media, KAN, KNOK, Scientific Research Institute of Cardiology and Internal Diseases; Scientific Centre of Obstetrics, Gynaecology and Prenatal Medicine of Kazakhstan
▪ reporting	Committee of State SES, directed by the Chief Health Inspector under the Ministry of Health
Agencies supportive in national development programmes	UNICEF, WHO, ADB
International consultants	Consultants from UNICEF, consultants from the ADB

On basis of the above information, and following the published guideline of the global Network for Sustained Elimination of Iodine Deficiency, a summary assessment of the national program in Kazakhstan is provided in Table D.2.

Table D.2: A Summary of Kazakhstan Program Assessment

Programmatic indicators	**National program status**	**Plan of action to sustain USI**
An acting state body (Council or Committee), accountable to the government for the national programme. Chairman of this multidisciplinary organization is appointed by the Minister of Health.	Coordination Council under the Ministry of Health of the Republic of Kazakhstan	Organization of interagency coordination council under the Government of the Republic of Kazakhstan. Creation of similar councils, working groups under local oblast, city and district administrations (akimats).
Adoption of political obligations on USI and IDD (iodine deficiency disorders) elimination	Endorsement of goals at the UN Special Session on Children and adoption of Millennium Development Goals. Follow-through on the Minsk agreement among Heads of State of CIS countries. Minister of Health entered into an agreement with the Asian Development Bank. Permanent interactions of the Government and UNICEF.	Application by the Ministry of Health of the Republic of Kazakhstan for acknowledgment that USI has been achieved. State order of the of the Ministry of Health of the Republic of Kazakhstan on population iodine nutrition status assessments once every three years
Assignment of an executive officer responsible for the	The Ministry of Health of the Republic of Kazakhstan provides	The Chief Health Inspector acts on basis of obligatory national

IDD elimination programme	leadership through the agenda of the Committee of State Sanitary-Epidemiologic Surveillance. The Chairman of the Committee, the Chief Health Inspector is the responsible executive officer.	statistics and reports, consolidated in a national database at the Ministry of Health of the Republic of Kazakhstan
Adoption of legislative and regulatory acts on USI covering both human and agricultural salt	The law of the Republic of Kazakhstan № 489-PZ "On Prevention of Iodine Deficiency Disorders" dated 14 October 2003 Orders of the Ministry of Health of the Republic of KazakhstanNo 641 "On Rules and Procedures for monitoring of quality, manufacture, storage, import and realization of iodized salt and other foods enriched with iodine", dated 8 February 2004 Adoption of the Inter-State standard of GOST 13830-97 on "Cooking Salt". State standards on iodized salt Industrial standards for iodized salt Sanitary-epidemiological rules and norms The Customs Code of the Republic of Kazakhstan Service instructions to territorial bodies on the realization of Law "On Prevention of Iodine Deficiency Disorders", dated 14 October 2003	Finalization and approval of the "National program to prevent micronutrient deficiencies" and of the "National program for food product fortification" by Decree of the Government of the Republic of Kazakhstan. Continuation of activities on monitoring the amount and quality of iodized salt by a working group made up of officers of the Ministry of Health, the Ministry of Industry and Trade, and the Ministry of Finance of the Republic of Kazakhstan
Commitment to assessment and re-assessment of progress toward IDD elimination with accurate data on salt iodine and urinary iodine in a reputable iodine laboratory	Nationally representative surveys, connecting the use of iodized salt in households and iodine nutrition status in women of reproductive age have been carried out in 1999 and 2006. National expert capacity for laboratory iodine assessment is established in the Kazakh Academy of Nutrition. The iodine laboratory is a nodal point in the	The Ministry of Health of the Republic of Kazakhstan has issued a State Order on population iodine nutrition assessments once every three years through the Kazakh Academy of Nutrition

	CDC-managed international laboratory reference and exchange scheme and provides trouble-shooting assistance to laboratories in nearby countries	
A program of public education and social mobilization on the benefits of IS consumption and importance of IDD	A comprehensive, strategic communications plan was conceived and pilot-tested in 2002 and carried out with involvement of a full array of partners in 2003-2006. Essential elements of the plan have become inserted in the ongoing national education system.	Continued exploration and bringing "on board" of new partner organizations for social mobilization around the fortification of foods. Examples are female-gender organizations, culture promotion centres, trade unions, etc.
Regular data on salt iodine content at factories, retail and household levels	The Order of the Ministry of Health№ 641 "On Rules and Procedure for monitoring of quality, manufacturing, storage, import and sale of iodized salts and other food products fortified with iodine compounds" dated a8 February 2004: The results of the salt iodine inspections by SES authorities are reported quarterly; Results of production and supply inspections by Customs and Metrology authorities are reported annually; Agency of Statistics reports annually on iodized salt supplies to the population; Also annual reporting by the Association of Salt Producers in Kazakhstan	Further consolidation and systematization of supply, consumption and impact information will take place of the national database maintained by the Committee of State Sanitary-Epidemiologic Surveillance in the Ministry of Health
Regular laboratory data on urinary iodine excretion in school aged children with appropriate sampling for higher risk areas	The Kazakh Academy of Nutrition has carried out population-representative surveys as part of the DHS in 1999 and the MICS in 2006 on the urinary iodine excretion in women of reproductive age, using designs and sampling strategies aligned to those of the parent surveys. All the Oblasts of Kazakhstan are at risk of iodine deficiency, and the legislation is based on a uniform mandate. Therefore specific sampling for higher risk areas is not considered appropriate or relevant.	Future plans include specific information collection of the iodine nutrition situation among pregnant women. Studies may be undertaken under the Ministry of Health State Order to assess iodine nutrition in the population once every three yours, or as part of special local budgets of Oblast akimats
Cooperation from the salt industry regarding salt quality assurance	The responsibility for the exclusive, uniform supply of adequately iodized salt for	Continuous coordination and intensification of actions between SES authorities, NGOs

	households and food industries rests with the salt industries. The Association of Salt Producers is a fully respected and cooperative partner of the national IDD elimination program.	and salt industry dealers regarding the amount and quality of iodized salt supplies in consumer market
A database for consolidation of regular monitoring results, especially salt iodine, urinary iodine excretion and, if available, neonatal TSH with mandatory public reporting	The Order of the Ministry of Health№ 641 "On Rules and Procedure for monitoring of quality, manufacturing, storage, import and sale of iodized salts and other food products fortified with iodine compounds" dated a8 February 2004, stipulates the requirements for "creation of a national monitoring database" and "regular information to be provided to the general public". The Committee of State Sanitary – Epidemiological Surveillance, under the Chief Health Inspector, is the principal database holder. The data on iodized salt amount and quality at production and in markets are coordinated with data on endocrine morbidity in the population obtained from the Ministry of Health's Department of Treatment & Prophylactics.	A missing link between, on the one hand, the quarterly data on iodized salt supplies of production, import and markets and, on the other, the annual morbidity reports is the lack of regular data on the iodine consumption and iodine nutrition status in the population. This gap is proposed to be addressed in the future by an Order for the conduct of Oblast-based mini-surveys once per year, using small sample sizes of pregnant women in prenatal clinics on rotation basis. Centres for newborn screening of congenital hypothyroidism are being created on the basis of six existing large obstetrical institutions in Kazakhstan, along with the creation of a database in the Republican Scientific Centre of Obstetrics, Gynaecology and Neonatology of the Republics of Kazakhstan.

2. Strengths, Weaknesses and the Way Forward

Based on the results from three large-scale household surveys in 1999, 2004 and 2006, and combined with knowledge of the actions and events taking place in Kazakhstan during the same time period, the following description of progress and achievement can be provided:

The salt supply in different areas of Kazakhstan follows distinct patterns related to their supply sources and the industry's proximity and business relations with market outlets. With its share of at least 75 percent of the domestic consumption, AralTuz is the major domestic source of salt for use in the food industry and the households. It is dominating the markets in the southern and central parts of Kazakhstan and in Almaty City, while it has also a significant market share in the west and the east of the country. The edible salt supply of Pavlodarsol Company, the 2nd domestic source, is mainly used in the northern and central areas, while in the west of Kazakhstan the majority of households use salt imported from Russia. The entry of salt supply from SuzakTuz, a newcomer in the market, may have caused the noticeable deterioration in the shares of adequately iodized salt in households of Kyzyl-Orda Oblast, Zhambyl Oblast and Almaty City during the 3-month period between the MICS

and the NMS surveys in 2006. It is noteworthy that the majority of households in Kazakhstan store the salt for cooking and meal preparation without its original package.

The baseline survey in 1999 confirmed that dietary iodine deficiency was a national public health problem. Major improvements in the supply of iodized household salt in the south, west and central parts of the country and in Almaty City took place prior to 2004, while in the north and east, these supplies improved largely during the period from 2004 until 2006. Together, the changes in supplies have led to increases in the use of adequately iodized salt in the households from approximately one in five households in 1999 to more than 90 percent of households in 2006. During the same time period of less than a decade, the share of urinary iodine concentrations below 100μg/L in women living in these households decreased from 53 percent at baseline to 14 percent in 2006. In 2006, the median concentration of urinary iodine among women of reproductive age in Kazakhstan was 250μg/L, compared to 95μg/L in 1999.

The pattern of household salt supplies by industry source in Kazakhstan does not strictly follow the geographical boundaries used in the design of the 1999 and 2004 surveys. Also, since the legislation in Kazakhstan stipulated that all edible salt should be iodized, the consumption of iodine from household salt is only one of the sources of additional dietary iodine intake in the population. These two factors together were likely the major reasons why the wide range of salt iodine levels observed in the households of Kazakhstan in 2006 did not produce a risk relationship at the aggregate level with the UIC values in adult female household members. The failure of finding such a relationship does not mean that the relationship does not exist, however. When analyzing the iodine consumption and status indicators across Oblasts, the proportions of the women's UIC values above 100μg/L were found to be significantly associated with increases in the use of adequately iodized salt in their households. The finding of this relationship in the 2006 survey thus offers an affirmation that the USI strategy in Kazakhstan is the underlying factor that alleviates the iodine deficiency problem in the population. In view of the ample sufficiency of the urinary iodine excretion levels in women of reproductive age, it can be inferred that the current strategy of iodizing all consumption salt at the levels adopted in Kazakhstan, by itself, is sufficient for eliminating the public health problem of iodine deficiency in the population.

The outstanding progress in Kazakhstan has come about over a relatively short period of close collaboration by a wide range of entities from public, private and civic sources. The top political leadership evidenced in the adoption of political obligations by the President on behalf of the nation, the high-level technical leadership vested in the Committee of State Sanitary-Epidemiological Surveillance under the Ministry of Health, and the modern scientific leadership in the performance of population assessments of the iodine nutrition situation by the Kazakh Academy of Nutrition are three major pillars of strengths. Nevertheless, the productive salt industry and attentive non-governmental society organizations played their indispensable parts in ensuring the desired amount and quality of supplies, and in insisting on the exclusive use of iodized salt in the entire Republic. The well-devised and planned communications campaign, which was systematically tested and piloted, rolled-out and reinforced in a joint effort by a wide multi-sector coalition of partner organizations over a period of almost 5 year is an exemplary model for other countries. The system established in Kazakhstan bodes well for likely future permanence. The costs of continuing the efforts have largely been inserted in the ongoing institutional budgets of private and public sectors, while the data methods to ascertain continued success are being geared toward building a strong national ability for surveillance and decision making, as and when required.

Generally, the weaknesses in the execution of USI strategy for IDD elimination in Kazakhstan may be considered minor in comparison to the strengths, but they nevertheless deserve being addressed. The relaxation of rules permitted to a single caviar manufacturer is insignificant in a quantitative sense given the exotic nature of the product, but the dispensation for rennet cheese manufacturers to

use non-iodized salt may signal the beginning of food industry-wide pressure on Government to renege on the necessary use of iodized salt in industrial food manufacturing with salt as an ingredient. Moreover, the permission will complicate the ease of inspections by SES authorities in the salt supply markets. The amendment proposal submitted to Government by the Ministry of Health, dated 29 August 2006, on the Law "On Prevention of Iodine deficiency Disorders" deserves being reviewed from the principle standpoint that no dispensation is justified unless a food manufacturing industry sector can provide objective demonstration on their own account that the use of iodized salt is detrimental to the end product. The international experience on this is clear.

Two associated factors stand out when considering the question how in Kazakhstan the present practice may be improved. There is need to verify the assumption that also pregnant women, the most vulnerable population group, obtain sufficient iodine intake when they follow the advise to reduce their salt consumption. A related factor is that there is need to fill the existing information gap in the national database on the connection between the iodized salt supplies and the iodine nutrition status in the population. These two needs can be addressed jointly, and on priority, by studies once a year in each Oblast of small groups of pregnant women sampled in the prenatal clinics. Connecting their use of iodized household salt with their urinary excretion would enable evaluating the adequacy of their iodine status in relation to the iodine supplies from USI. Covering four Oblasts each quarter would produce one national surveillance picture each year.

Finally, although the privilege of providing free iodine supplements to vulnerable population groups may be considered as grounded in historical experience, the present evidence of optimum population iodine nutrition achieved from USI is sufficient to justify the discontinuation of these entitlements thus freeing up resources for the improvements in population surveillance mentioned above.

Conclusion

This document provides a dossier of the processes that have lead to USI attainment in Kazakhstan. The description addresses the questions why the IDD elimination program is being carried out, what the program expects to accomplish and how it set out to achieve the essential and sufficient USI strategy. The dossier also includes an attempt to identify the factors leading to success and it offers an analysis of evidence that the USI goal was attained by 2006. Finally, the analysis of the processes has revealed the priority directions to improve upon the ongoing program, in particular with respect to the perfection of surveillance required for decisions that will sustain the success into the future.

The successful investment in Kazakhstan in protection of the intelligence of each new generation of newborns against the brain damage of iodine deficiency is a precious achievement in the eyes of all partner organizations that have collaborated toward its achievement and will continue working jointly to sustain the elimination of iodine deficiency through the USI strategy. As the leading coordination agency and on behalf of all the partners, the Committee of State Sanitary-Epidemiological Surveillance of the Ministry of Health of the Republic of Kazakhstan respectfully submits this dossier to the global Network for Sustained Elimination of Iodine Deficiency with the request for their acknowledgement of USI goal achievement in Kazakhstan.

Principle Key Actions to Sustain the Elimination of Iodine Deficiency in Kazakhstan

Key action	By whom	Responsible for coordination
Continued provision of national leadership • Political • Technical • Scientific	National structures and key institutions • Food Fortification Coordination Council • Committee of State SES • Kazakh Academy of Nutrition	Chief Health Inspector, designated by the Minister of Health
Continued supplies of only iodized salt for human use	Productive salt industry sector • Domestic producers • Import firms • Wholesalers and retailers	Association of Salt Producers of Kazakhstan through the private sector' networks of members
Continued expansion of inter-sector and public communication • To politicians • Among partners • Assuring public acceptance	At political level, Chief Health Inspector informs Parliament and high-level politicians Each partner organization carries responsibility for regular exchanges of information, and the continued promotion of the USI strategy Educational institutions carry responsibility for continued appropriate insertions in ongoing training programs	Chief Health Inspector, designated by the Minister of Health through the appropriate channels and Kazakh Academy of Nutrition through • Direct stimulation of regular exchanges among partners • Periodic review of educational and training curriculums
Continued database management • Data consolidation and • Information analysis, Decision-making and Public reporting	Inputs of data and information from • SES authorities of MoH • Customs under MoF • Inspectors of MoIT • Agency of Statistics • Kazakh Academy of Nutrition • Health care institutions Analysis, decisions and public reporting through the Committee of State SES, chaired by Chief Health Inspector	Chief Health Inspector, designated by the Minister of Health