ON ASSESSMENT OF IMPLEMENTATION STATUS OF VARIOUS COMPONENTS OF THE NATIONAL IDD ELIMINATION PROGRAMME IN ARMENIA

(Reviewing progress towards elimination of IDD and universal salt iodization)

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Technical report on assessment of implementation status of various components of the National IDD elimination programme in Armenia presents the Reviewing progress towards elimination of IDD and universal salt iodization. Report is designed for health system organizers, health experts, clinicians, as well as other specialists interested and involved in health system issues.

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Acronyms

ASC	Avan Salt Company (Armenia)
CIS	Commonwealth of Independent States
DHS	Demographic and Health Survey
GoA	Government of Armenia
IDD	Iodine Deficiency Disorders
IGN	Iodine Global Network
JSC	Joint Stock Company
MoH	Ministry of Health
NCDC	National Centre for Disease Controland Prevention, RA MoH
NGO	Non-governmental Organization
NIH	National Institute of Health, RA MoH
NHIAC	National Health Information Analytic Centre
NRL	National Reference Laboratory of NCDC
OPD	Out-patient department (polyclinic)
PHC	Primary Health Care
QA	Quality Assurance
RA	Republic of Armenia
SFSS	State Food Safety Service of the RA Ministry of Agriculture
SP	Soli Proprietor
UIC	Urinary Iodine Concentration
UNICEF	United Nations Children's Fund
USI	Universal Salt Iodization
WHO	World Health Organization

Technical report on assessment of implementation status of various components of the National IDD elimination programme in Armenia (reviewing progress towards elimination of IDD and universal salt iodization)

1. Background information

In 1950s, the Republic of Armenia was among former USSR regions quite seriously affected by iodine deficiency with relatively high goiter rates. To address this public health challenge, the Government of Armenia embarked on supply of the population of endemic areas with iodized table salt. Since 1970, the country's single salt producer - Avan Salt Company (ASC) started producing "Extra" quality vacuum salt for local supply and export of iodized salt at 23 ± 13.5 mg iodine/kg salt using potassium iodide (USSR standard at that time).

Due to socioeconomic downturn of early-1990s, salt iodization in Armenia almost interrupted, and the population was consuming non-iodized salt, imported from Iran and Ukraine. In 1995, a local study revealed endemic goitre in 50,4% of pregnant women and in 40% of 6-12 years old children. Upon the Government's request (1995), UNICEF assisted in modernizing the ASC production line and improving the laboratory-based quality assurance capacity in the factory. In 1997, a Goiter Control Unit was established in the Ministry of Health (MoH) for thyroid volume and UI assessments; the iodization standard was revised to 35 ± 10 mg iodine/kg salt as potassium iodate (iodization remained voluntary). Just in a year, rather positive results were observed: the national iodine study (1998) with external technical assistance showed that 73% of households were using iodized salt and UI level in 68%of children under 5were above 100 μg/L. At the same time, endemic goiter of various grades was revealed in 30% of women of reproductive age (6% visible); the prevalence of iodine deficiency disorders in children under 5 composed 31%.

The RA Demographic Health Survey of 2000 provided data indicating further increase in the proportion of country households consuming iodized salt (83,6% with > 15 ppm iodine).Nevertheless, the level of iodine in 6,8%of salt samples was below 15 ppm.In several districts of the country, 24-27%of salt samples did not contain iodine at all. Based on these data, the MoH (2001) recommended and the Armenia's State Standard Department approved increasing the standard to 50 ± 10 mg iodine/kg salt.

In 2004, the Government of Armenia adopted the decree No 353-N"On approval of the national programme for control and prevention of dietary iodine deficiency among the population of the Republic of Armenia and the timetable for the plan of priority actions, 2004–2007". The USI in Armenia became mandatory, and the import of the non-iodized salt was prohibited. A year later, the Survey of Iodine Nutrition conducted with UNICEF support showed that 97.2% of household salt samples contained more than 15 mg iodine/kg salt and the national median UI level among 8-10 years old children was 313 μg/L, exceeding the upper recommended limit. Hence, Armenia was advised to reduce the mandated standard to the agreed-upon CIS level of 40 ± 15 mg iodine/kg salt.

In general, the above study confirmed that Armenia eliminated iodine deficiency in its population through effective programme of universal salt iodization. It was concluded that the ASC was a strong proponent of USI, consistently iodizing its edible salt production. The food manufacturing industry was apparently making considerable contribution to dietary iodine consumption thanks to its use of iodized salt in processed foods (though no data was reported). The success in attaining the goal of elimination of iodine deficiency in Armenia was acknowledged in July 2006 by the Network for Sustained Elimination of Iodine Deficiency (Iodine Network, ICC/IDD, UNICEF and WHO certificate was granted to the country).

Subsequent years were marked by rather radical reforms in health and agriculture sectors, some of which had considerable implications for sustainable implementation of the national IDD elimination programme in Armenia. The responsibility on food monitoring/oversight and standard setting was assigned to the State Food Safety Service(SFSS) of the Ministry of Agriculture (thus contributing to poor integration of food-related health protection and health promotion activities).The government decree of 2004(No 353-N) in the part of its timetable for the plan of priority actions was not updated. The SFSS risk-based audit plans for food products did not envisage monitoring of iodine content in the food-grade salt, and the MoH continued (2009-2016) monitoring the iodine content in the salt on household level, only. The country's USI strategy missed an important component – the monitoring of the salt retail and manufactured food.Then, the splitting of the former Hygienicand Anti-epidemic Inspectorate (2013) into two new structures further contributed to unclear situation with roles and responsibilities of stakeholders in the oversight of the programme.

An important milestone for Armenia's IDD elimination programme became UNICEF/ IGN sub-regional USI sustainability workshop for countries of Eastern Europe and Central Asia (September 24–25, 2015, Almaty, Kazakhstan), that reviewed country progress and proposed country-specific plans (Road Maps) to ensure sustained IDD elimination. The Road Map for Armenia included: eestablishing an intersectoral committee to ensure cooperation between government sectors and other stakeholders for coordination of activities, information sharing and reporting; monitoring of activities and evaluation of their impact on iodine nutrition (assessment of UI levels);regular representative study of IDD prevalence in the country; strengthening the IEC work among population and profession on the importance of IDD elimination through USI (for consumption of quality iodized salt).

Guided by the above Road Map, two important steps were undertaken, as early as in 2016, to strengthen the regulatory framework for monitoring of all salt destined for human consumption (not only table salt) and to initiate a population-representative survey on urinary iodine concentration (biomonitoring) to reassess the iodine nutrition status and progress in the elimination of IDD(by MoH in cooperation with the Ministry of Agriculture and by YSMU in cooperation with external partners – IGN and USA Columbia University).

This project is aimed atreviewing the implementation status of various components of the National IDD elimination programme– its achievements and needs, as well as at developing recommendations for sustained implementation of USI strategy in Armenia (to ensure sustainability of elimination of iodine deficiency for future generations). The main objectives and activities are as follows;

- **Review current regulatory framework for sustainable implementation of the National IDD elimination programme in Armenia**, including drafting recommendations for development of programme framework document and multi-sectoral mechanism (multidisciplinary group or committee)
- **Develop ToR for monitoring of iodization strategy in the country** (specifying roles and responsibilities of stakeholders), including development of recommendations (through Ministry of Health) for regular data collection and interpretation of activities and results for joint multisectoral decision-making and periodic reporting (about the state of the strategy), as well as for addressing biomonitoring opportunities at newly-established National Reference Laboratory of the MoH.
- **Collate information on supply of domestic and imported food-grade salt,** including identification of loop-holes for supply of non-iodized salt (as well as, carry out a survey of

3 supermarkets and 20 small food markets of the retail system and provide expert estimate on the proportion of non-iodized salt);

- **Review prevalence of thyroid disorders** (from official health statistics) to supplement the Armenia's IDD dynamics with data of 2015-2016, including an interview of the staff of the MoH Health Information Analytic Centre for development of recommendations for goitre prevalence representative survey (as well as identifying needs for improving IDD reporting at health facility level).
- **Collate information on existing IEC materials** for health care providers and general population, identify the needs and develop recommendations to the MoH for systematic work in this area (as well as to develop a leaflet to increase knowledge on IDD and consumption of iodized salt, specifically addressing misperceptions that support demand for non-iodized food-grade salt).

Overall coordination and financial support for this activity is provided by IGN (Professor Gregory Gerasimov, IGN Regional Coordinator for Eastern Europe/Central Asia). Deliverables and the timeframe of the activity are presented in the Annex 1.

2. Regulatory framework for sustainable implementation of the National IDD elimination programme in Armenia

Review of regulatory documents for implementation of the National IDD elimination programme and USI in Armenia revealed the following key points:

- The general regulatory framework for development and implementation of the National IDD elimination programme and USI in Armeniawas provided by the RA Law"On Ensuring Sanitary-Epidemic Safety of the Population of the Republic of Armenia" (No HN-0732-1 of 16.11.1992) and by CIS Intergovernmental Agreement "On Prevention of Iodine Deficiency Conditions among Population of Member States of the Commonwealth of Independent States" (signed 31.05.2001, Minsk; ratified 13.03.2002, Yerevan).
- The CIS agreement on a common iodization standard (40±15 mg iodine/kg salt)and collaboration in promoting trade and proper salt quality was a key factor in facilitating the USI strategy in Armenia.The country's relevant regulatory document was enacted on 12 February 2004: the government adopted the decree No 353-N "On approval of the national programme for control and prevention of dietary iodine deficiency among the

population of the Republic of Armenia, the timetable for the plan of priority actions (2004–2007)and introduction of amendment to the RA Government decree No 902 of 31 December 2000". The USI in Armenia became mandatory (though voluntary iodization standardsuggested back in 2001at 50±10 mg iodine/kg saltwas reconfirmed); production and import of the non-iodized salt and its use for food processing was prohibited, except for cases when the use of iodized salt is not allowed by production technology (the latteris a loophole, permitting sale and use of non-iodized salt).

- The approved programme included 8 strategies: development of regulations (on packaging, labelling, etc.); provision of use of iodized food-grade salt (ensuring USI in the country, prohibiting import and sale of non-iodized salt and its use for food processing); IDD detection/treatment; monitoring over the level of iodine in iodized salt; training of health service providers on IDD prevention and control; promotion of food as additional source of iodine (including assessment of feasibility for the use of iodized salt in animal feeding);advocacy and information dissemination; evaluation of the IDD elimination programme effectiveness.
- Follow-up regulation was developed afterUNICEF-supported Survey of Iodine Nutritionin Armenia (2005). According to results of the survey, 97.2% of household salt samples contained more than 15 mg iodine/kg salt and the national median UI level among 8-10 years old children was 313 μg/L (the latter exceeds the WHO-recommended upper limit).Armenia was advised to reduce the mandated standard to the agreed-upon CIS level of 40 ± 15 mg iodine/kg salt (the need for continued oversight was emphasized, as well). Hence, the RA Government decree No 1863-N of 21.12.2006 "On amendment of the RA Government decree No 353 of 12 February 2004" recommended to replacethe figures "50±10" in the sub-point "2a" of the decree No 353 by figures "40±15" (in effect from 01 July 2007).However, the timetable for the plan of priority actions (2004–2007) was not updated, and the MoH did not play leadership role in handing over relevant actions of this multisectoral initiative to the SFSS.
- The National IDD elimination program ecomponents on monitoring and advocacy for 2012-2014 were mentioned in the action plan, adopted through Government decree No 1522-N of 13.10.2011 - "On endorsement of the programme of activities proceeding from the concept of the food security in the Republic of Armenia" (points 9.2 and 9.3).
- On 25 September 2014, the Government of Armenia through its protocol decree No40 approved "The concept for improving the nutrition of children and action programme for its implementation in 2015-2020". Alongside with numerous challenges in the area of child health and nutrition, the concept document identified issues relevant to the

implementation status of the IDD elimination and USI in Armenia, such as: difficulties in ensuring sustainability of achievements of the national programme and absence of a system for biomonitoring (point **65.3**); it also emphasized the overall need for intersectoral cooperation in the field of child health and nutrition (**69**). The strategic goal on the part of child iodine nutrition (**72.1.ja**) is "to continuously ensure the proportion of iodized salt consumption over 95% for households with 0-5-years old children". The action programme suggests continuous implementation of activities for IDD control in 2015-2020 (point 8), including: monitoring of iodine content in food-grade salt; study on iodine level in the urine; development of reporting forms for thyroid disease; advocacy on IDD prevention; as well as, introduction of IDD prevention guideline in 2015-2017.

- The programme regulatory framework was further strengthened following UNICEF/IGN sub-regional USI sustainability workshop for countries of Eastern Europe and Central Asia (September 24–25, 2015, Almaty, Kazakhstan),that proposed country-specific plans to ensure sustained IDD elimination (see Armenia's plan, page 5). Upon the RA Prime-Minister's Instruction No 02/14.7/17487-15 of 12.10.2015 and in accordance with the MoH Order No 3688-A of 23.12.2015, a working group of experts from the health and agriculture sectors was established that developed "The order of the state control and implementation of monitoring over the content of iodine in food-grade salt, information exchange and public communication". This order package was then adopted through the Joint Order of the MoH (No 829-A of 23.03.2016) and the Ministry of Agriculture (No 74-A of 18.03.2016).The Joint Order defines procedures for monitoring of iodine content in the salt: **a)** in the retail system (both, locally produced and imported) and in manufactured foods(industry and catering) - by SFSS, the authorized body in the area of food security (assigned by the Go A Decree No 218-N of 21.02.2013); **b)**in households – by NCDC, in conjunction with its routine investigations of foci of communicable diseases(Go A decree No 353-N of 12.02. 2004); **c)** methodology for analysis of iodine content in food-grade salt, fortified with potassium iodate; **d)** procedures/forms for data exchange and public communication. Yet, the Joint Order does not suggest a joint coordination mechanism (to involve stakeholders, e.g. MoH, SFSS, the industry, etc.), maintenance of a database, joint interpretation of data and activities, reporting and dissemination of information - altogether to facilitate concert edaction by the principal stakeholders.
- Since 1997,the IDD elimination through salt iodization in Armenia was approached as a MoH-led intervention: external monitoring on the retail and household levels was based on MoH Order No 405 (of 18 July 1997); through an internal act (MoH order),a

Multidisciplinary Working Group (MWG)was established that waschaired by Deputy Minister of Health and was responsible for oversight of the national programme.IDD elimination programme manager was appointed, as well (Dr. M. Basilisyan, up to mid-2009).The effective work of the above MWG and the programme manager provided enactment of USI strategy (2004) and, then, remarkable success in eliminating iodine deficiency in Armenia (certified in July 2006).After 2007, based on provisions of the RA Law "On Food Safety" (2006), the responsibility on food monitoring and standard setting was assigned to the State Food Safety Service(SFSS) of the Ministry of Agriculture (the SFSS audit plans up to 2017 did not envisage monitoring of iodine content in the salt).

- **Structures and mechanisms to enable intersectoral decision-making and action.**Desk-review of the above regulatory documents revealed lack of due attention to the USI forth component – the strategy oversight, which normally is aimed at bringing the stakeholders together to jointly manage the progress, discuss emergent information, make decisions on barriers, and promote public accountability by regular publicity (F. van der Haar, G. Gerasimov, et al., 2011). Since 2009, the household salt monitoring and advocacy components of the national programme have been implemented by the MoH State hygienic and anti-epidemic inspectorate (SHAI).In 2013, the SAEI was reorganized into two structures: MoH State Health Inspectorate (SHI) and MoH National Centre for Disease Control (NCDC). The successor of the programme manager moved to SHI, while the operation remained with NCDC. The coordination of the above structures was entrusted to two different deputies of the Health Minister. Lack of explicitly defined functions of these bodies resulted in weak interaction, inter alia, for implementation of the country's IDD elimination programme. None of them took the lead for development of an overriding mechanism or an overarching plan to coordinate the above work within the health sector and beyond (e.g. to involve SFSS) and to ensure that these agencies work closely together towards common objectives. Even after adoption of the Joint Order of the MoH and the Ministry of Agriculture (March 2016, see above), the Multidisciplinary Working Group responsible for overseeing National Programme on Control and Prevention of Iodine Deficiency was not (re)established,an IDD programme manager was not appointed.

3. Salt situation in Armenia and assessment of supply of different types of food-grade salt through retail food stores

Analysis of the situation on salt production and supply (both, domestic and imported) revealed the following key points:

- In Armenia, the Avan Salt Company (ASC) is the single salt producer and it consistently supplies adequately iodized edible salt product. Back in 1998-1999,the ASC had been annually supplying 12,000 MTof fully iodizededible salt and this amount was considered sufficient to cover national consumption needs (F. van der Haar, G. Gerasimov, et al., 2011).
- Throughout recent four years (2013-2016), the ASC was annually supplying around15,000 MT of food-grade salt composed of two types of adequately iodized salt - vacuum quality salt and ground rock salt, in the ratio 50 : 1 (Annex 2).In parallel, the factory produces around 6,000 MT of "selective rock salt" (5-10 kg pieces)mainly for animal consumption (3/4 of the total amount) and, partially (1/4 or approx. 1,400 MT) - for grinding and packaging by the ASC itself (labelled as "for industrial purposes") and by small-scale salt producers (approx. 10workshops) and further supply of this non-iodized salt product to food stores (up to 20%) and, directly, to food processors (up to 80%).
- Like other food products, salt is a product of open market-based economy and the local supplier (ASC) has tocompete against salt imported from foreign sources. According to data from the RA Ministry of Economic Development and Investments, the total amount of imported food-grade iodized saltfor recent 4yearsranged within 2-3 thousand MT per year (Annex 2), constituting approx.1/5 share of the salt supply in the national markets. In 2016, the largest share of the imported food grade-salt (85% of that 1/5 share) was from 3 countries – Ukraine (39%), Iran (31%) and Russian Federation (15%) – all labelled as iodized. The rest was imported from 13 more countries (9% from Turkey, Austria and France), composed mainly of non-iodized or low iodine-containing salt – marine, "alpine", fluorinated, etc. Export of various salt products from Armenia is relatively small - at 200 MT maximum (iodized edible salt constitutes up to 25% of this amount).
- An approximate estimate of the total amount of food-grade salt (both, iodized and non-iodized), produced per annum in Armenia and imported from foreign sources (an average for 4 years), is 19,100 MT, or 6,37kg per capita. Of this amount, up to 17,700MT, or 5,9kg per capita (approx.**93%**) is iodized. The ASC dominates the country salt markets; its food-grade salt is fully iodized and is apparently sufficient (approx. 15,000 MT or 5 kg per

capita) to cover national iodized salt needs for human consumption, though some little share (8%) of its salt products, namely, up to 1400 MT out of 6,000 MT selective salt rocks, is supplied to small grinding/packaging workshops and through them can reach households and food processors (as non-iodized salt).

- When surveying retail salt supply, 93 samples of food-grade salt of 2-7 types were observed on the shelves of32 select food stores - supermarkets, common markets and soli proprietor's stores, located in Yerevan and in settlements of Armavir and Kotayk marzes (administrative regions). Of total 93 salt samples (Annex 3), 61were iodized salt products, supplied by ASC - 38 samples, C/Z Salt Co, Iran - 14 samples, ARTEMSOL, Ukraine - 9 samples. At least, 1-3 type iodized salt products were available at all stores surveyed (except a small village store, sailing only non-iodized salt).In principle, there were no territorial or other barriers for access to iodine-fortified salt.
- The food-grade salt "Iletskaya" from Russian Federation ("Russol" ltd., Orenburg oblast, Sol-Iletskcity) was labeled in Armenianas iodine-fortified, whereas the packaging information in Russian and Kazakh languages did not mention potassium or iodine on the list of chemical elements, available in the product (sodium, selenium, etc.).To clarify this discrepancy, a sample of "Iletskaya" salt was taken to two laboratories (ASC and NCDC) to determine availability of iodinein this product. Quantitative laboratory analysis was done using the standard titration technique for both potassium iodate and iodide. The salt was found not iodized at all: thus, the content did not match the label (in Armenian). Apparently, the salt imports need to be more closely monitored for adequacy.
- Alongside with various types of iodized food-grade salt, 20 samples of non-iodized salt products (of total 93 samples) were observed on the shelves of 17 food stores (of 32 stores surveyed). In two of them, the shop-girls were aware of the use of non-iodized salt for pickling purposes and they seemed sharing misperceptions of some food processors whobelieve that iodized salt is unusable for preserving ("shortens" shelf-life of products). Though the share of this salt in the markets (280 MT from local soli proprietors and 90 MT imported) is rather small (2% of 17,700MT), howeverthe availability of non-iodized food-grade salt for households and food processors may yet turn out to be of certain significance, if its share is extended or when policies are in place to influence national dietary salt reduction (according to "ARMENIA STEPS Survey, 2016-2017. Fact Sheet", adults aged 18-69consume around 10 g of salt per day, which is considered as one of risk factors responsible for high rates of hypertension, cardiovascular disease and stroke; however, there are not policies in place to influence dietary salt reduction, yet).

4. Monitoring of iodized salt consumption in households and its use in food processing

Per the scope of this work, review of the monitoring component of USI strategyincluded analysis of existing data on consumption of iodized salt in households (salt, used for home cooking and at the table), collection of information on the use of iodized salt for food processing and food processors' level of knowledge on iodine nutrition (small ltd staff or soli proprietors in bread baking, vegetable pickling, cheese-making, etc.).The main findings were as follows:

- The RADemographic Health Surveys of 2000, 2005 and 2015/16 provided data on theproportions of country households consuming adequately iodized salt,constituting respectively 83.6% (>15 ppm,n=5976),97,1% (n=6656) and98,7% (n=7838).Thus, the use of iodized salt in households since 2000 has significantly improved.
- Since 1997, the RA MoH had been conducting external monitoring of the salt on the retail and household levels (MoH order No 405 of 18.07.1997). However, after 2007, due to transfer of food monitoring operation to SFSS of the Ministry of Agriculture, the MoH/NCDC went on monitoring the iodine content in the salt on household level only (2009-2016 data are presented in Annex4). The salt sampling was linked to NCDC staff visits to foci of communicable diseases (the results of analyses are reported from regional laboratories to NCDC central office for aggregation).
- Within the period of 2009-2013, out of total 53136 salt samples only 22 (0,04%)did not comply with the national iodine standard; further, in 2014-2016, none of 44818 samples was non-iodized or inadequately iodized. The NCDC data are in contrast with recent DHS, which revealed at least 102 (1,3%) out of 7838 households using non-iodized or inadequately iodized salt. Recent survey on iodine nutrition (N. Hutchings, personal communication) also revealed certain amount of inadequately iodized salt samples: 41 - below and 2 - above recommended limits (in total 43 out of 500 samples or 8,6%).
- Up to 2017, the overall national monitoring system of USI strategy in Armenia did not cover salt retail and manufactured food. Stipulated by provisions of the Joint Order of the MoH and the Ministry of Agriculture (see above), in early-2017 the SFSS proceeded to inspecting iodized salt in the markets and the food industry. Scarce data for the first trimester of 2017 were shared with NCDC in a formal letter without specifying sources and types of the salt, sampling site, etc. Information was not accessible at SFSS website.
- According to review of USI experiences and achievementsin CEE/CIS during 2000–2009(F. van der Haar, G. Gerasimov, et al., 2011),the proportional contribution of iodized

household salt to total iodine consumption in Armenia was small in comparison with the consumption of iodine from foods manufactured with iodized salt (though no data were reported at that stage).Having in mind this assumption, a small sample of select food processors was reached out to assess the extent to which iodized salt is used in processed foods, as well as food processors' awareness on iodine nutrition (eventually to reveal gaps, if any, and inform further work on communication and oversight).

- The activity, implemented beyond the scope of this project, covered three widely consumed foods – bread (major staple food, 400 g/day), local cheese and pickles, processed/supplied on a "small scale" (2-12 MT per year)by small-size food manufacturers -ltd or soli proprietors from areas of interest (Yerevan and nearby settlements). Out of 59 food processors reached out, 42 agreed to participate in the interview (the other 17 food processors were not interested to participate). The survey questionnaire is presented in Annex 5 (the questionnaire is designed and the survey responses are aggregated in cooperation with N. Sergeeva, MoH PIU Monitoring and Evaluation Specialist; A. Zakaryan, Freelance Consultant in Psychology).
- Summary results on the key issue, i.e. on whether the salt used by food processors was iodized, are presented in the table below: these data indicate the majority of interviewed definitely using iodized salt (34 of 42, constituting 81% of questioned), several (5) - using non-iodized salt and a few more(3) - being not sure if the salt was iodized. The unsure respondents could simply be unaware users of either iodized or non-iodized salt and, therefore, the group of food processors using iodized salt could be considered being even larger (> 81%). This finding confirmed, in principle, the earlier conclusion (F. van der Haar, G. Gerasimov, et al., 2011) on key contribution of food processors to dietary iodine consumption in the country.

Table. Use of iodized salt in processed food (by a small sample of food processors)

Processed food	Number of food processors questioned	Use of iodized salt		
		Yes	No	Not sure
Bread	34	27	4	3
Cheese	4	4	0	0
Pickles	4	3	1	0
Total:	42	34 (81%)	5 (12%)	3 (7%)

- Other findings of this small sample survey were as follows:
  - Among 34 food processors using iodized salt, 23 respondents (68%)attributed their choice to health reasons; 7 respondents - to permanent availability of the popular "Extra" vacuum salt, 1 – to an advice of a medical worker; other 3–were not sure of any reason;
  - Out of total 5 food processors using non-iodized salt, 4 respondents used to buy a type of loose non-iodized rock salt for economic reason (as it is cheaper), and one – for better taste (?). Out of 4 respondents using cheaper non-iodized salt for economic reasons, an artisan baker, the single "lavash" baker (popular local bread) in the village had a fair level of knowledge of iodine needed by the thyroid gland for proper functioning(her daughter is a midwife, she has nodular goitre herself and the whole family is aware of IDD);
  - More than half of food processors interviewed (58-60%)had no or incorrect understanding that the thyroid gland needs iodine for proper functioning, had not ever heard of the effects of iodine deficiency on the human body, had notheard/seen any kind of information on prevention of iodine deficiency in Armenia and the need/importance of salt iodization for that purpose;
  - Less than half of survey respondents (40-42%) heard something about iodine deficiencyand believes that there were strategies to address the problem; these respondents indicated information sources (more than one) about iodine deficiency and its preventionin the following descending order: relatives/friends; TV; health worker; print media; internet.
- Certain inconsistency is noticed between the food processors' practice of using iodized salt and their awareness of iodine deficiency and its prevention. Targeted work is apparently required to address gaps in awareness of benefits of using iodized salt in food processing.
- Among processed foods, use of iodized salt in bread baking is considered as the most feasible delivery strategy for iodine(G. Gerasimov, 2009).Use of non-iodized salt for bread-baking in a stand-alone village may limit equal access of people to iodine-fortified salt (compared to people living in larger settlements, having many bakeries).

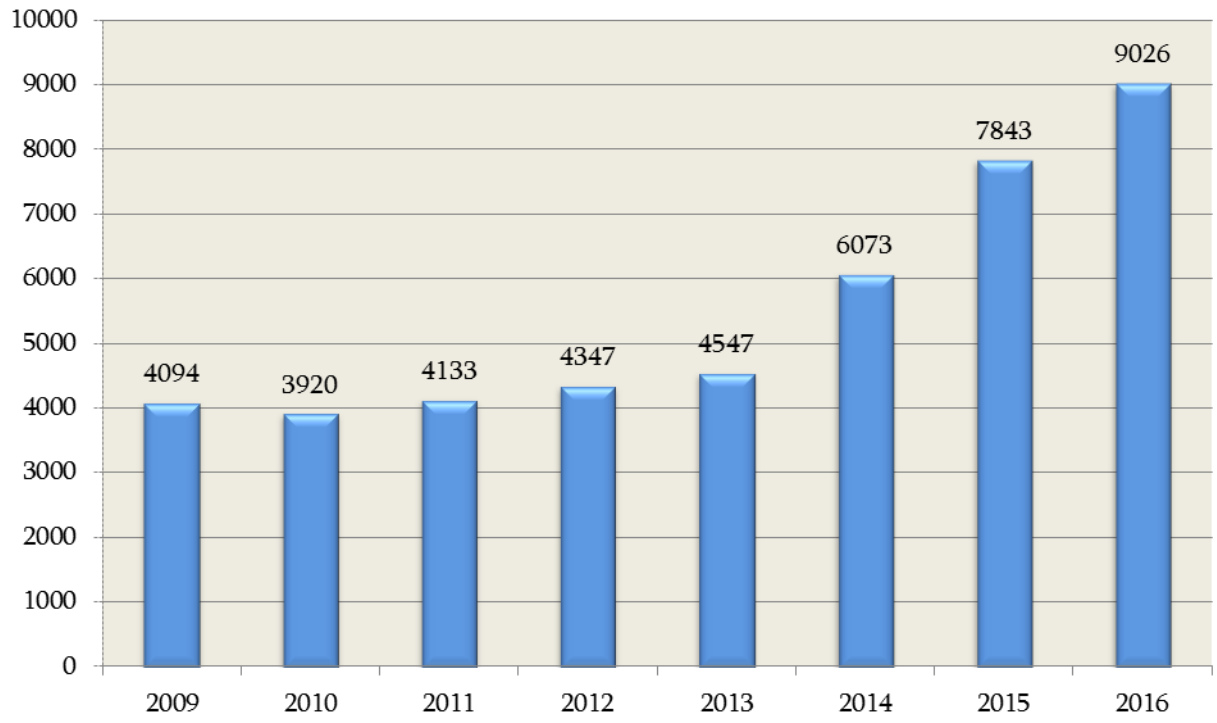
5. Monitoring of iodine nutrition status and IDD prevalence

Review of data on iodine nutrition (UI concentration in target groups) and health statistics on IDD prevalence in Armenia revealed the following key points:

- After UNICEF-supported UI assays of 1998 and 2005, throughout subsequent 12 years, the National Programme on Control and Prevention of Iodine Deficiency did not regularly monitor urinary iodine concentration to reassess the progress in the elimination of IDD (that is, 12 years had elapsed since the last national survey).
- Since end-2016 and up to mid-2017, the YSMU (Ministry of Education) supported by IGN and in cooperation with Columbia University (USA) started the third survey of iodine nutrition in Armenia. Urine and salt samples in 1200schoolchildren, adult and pregnant women were collected and sent to a laboratory in Boston (USA). The assessment results (UIC and iodine in salt) were presented at the "Conference on Iodine Nutrition Deficiency in Armenia", held in Yerevan on10 October 2017 (to be published). According to them, the UI distribution was within the recommended limits (close to upper level). A conclusion is made that the country's population has adequate iodine nutritionand is protected against iodine deficiency.
- All the above three assessments were conducted with external assistance (with UI assays in reputable iodine laboratories abroad). A feasibility study for creation of a national laboratory for regular UI determination was planned back in 2005 and the need to strengthen the system for assessment of iodine nutrition was recalled in the government decreeNo40 of 2014. However, a specialized laboratory to conduct regular UI studies is still absent, though one could be established and maintained at the newly-established (2016) modern National Reference Laboratory of the NCDC (a visit paid to the NRL indicated willingness and capacity of the staff to generate data on urinary iodine assays).
- The latest sample-representative goitre prevalence survey in Armenia was carried out in 1995 using palpation method. Throughout subsequent 22 years, no such an assessment was undertaken. Ultrasonography – a preferred method (WHO, 2014) in the areas with mild to moderate iodine deficiency - was not applied; the goitre as a sensitive long-term indicator for assessment of the success of IDD elimination programme was not used.
- **Armenia's health information system**(NIH/IAC) ensures monitoring of non-communicable diseases(aggregated data from health facilities) and, since 2007, the country health statistics, through reporting form N 13,covers the disorders of thyroid gland (E00-E07), including the following IDDs:E00 - congenital iodine-deficiency syndrome, E01 – iodine-deficiency related thyroid disorders and allied conditions, E02 - subclinical iodine-deficiency hypothyroidism.

- As shown on the Figure 1, data of NIH/IAC for recent 7 years (2009-2016) indicate noticeable increase (more than twice) in the total absolute number of the three registered IDDs. According to the MoH staff interviewed (Dr D. Andreasyan, Head of NIH/NHIAC; Drs E. Toromonyan and E. Aghajanova, MoH Chief experts in endocrinology), this increase could not be attributed to iodine deficiency, given the following:
  - In Armenia's iodine-replete population (referring to iodine consumption proportion over 97% and UI levels in target groups) it was impossible to distinguish iodine deficient goitre and subclinical hypothyroidism from goitre cases, which may occur because of the presence of goitrogens in the diet and autoimmune thyroid diseases;
  - In practice, at OPD level (especially in rural areas), the majority of IDD diagnosis were based on patient complaints without thyroid ultrasonography and functional indicators of iodine status. Experts believe that this might lead to IDD over diagnosis.

Figure 1.Prevalence of iodine deficiency thyroid diseases in Armenia, 2009-2016 (data received from Dr. Diana Andreasyan, Director of NIH/IAC of the MoH)



- It was agreed to recommend abolishing the reporting form N13 for IDDs and including a line on disorders of thyroid gland into the form N3 that reports on the group of endocrine diseases. The need for further training among profession at health facility level was emphasized, as well. Conducting a population-representative study of goitre prevalence in the country at this stage is not considered feasible.

6. Communication activities in support of USI strategy in Armenia

Analysis of information on communication activities revealed the following key points:

- Almost all regulatory documents on USI strategy in Armenia– government decrees and action plans, ministerial orders, etc. (chapter 2)–contain provisions for communication activities. Largely supported by UNICEF in the past (throughout 2005-2007),the National programme had been implementing training, public education and social mobilization activities to increase knowledge on IDD and consumption of iodized salt.The main focus of these activities, however, was on in-service training of health professionals. In principle, Armenia succeeded to achieve USI without a large-scale public communication campaign (apparently, largely thanks to committed work of the ASC, that continuously has been supplying adequately iodized edible salt).
- Within the period of 2011-2017, the MoH Public Relations Unit organized more than 300 public health communication activities, but none of these were devoted to awareness building on USI and its benefits. In 2016-2017, the NCDC - the main public health institution of the country and the principal stakeholder of the national IDD elimination programme– placed two brief messages on its Facebook page: first, on the iodized salt storage conditions and the second – recommending dietary salt reduction to 5-6 grams per day (emphasizing though the need to use iodized salt).
- After the "Conference on Iodine Nutrition Deficiency in Armenia" (October 2017), a group of young doctors, supported by "Jinishyan Foundation", proceeded to conducting a series of country-wide seminars on iodine nutrition and IDD reporting (from mid-November to mid-December 2017). This communication effort is also directed to build awareness among healthcare professionals (OPD family doctors, gynaecologists and endocrinologists) on iodine nutrition situation (results of UI survey) and the need for introduction of the new reporting form (see chapter 5).
- The communication activities on USI strategy are not institutionalized at the MoH/NCDC and SRSS or other stakeholders. There are no plans for targeted communication activities,

specifically to address lack of knowledge and/or misperceptions that support demand for non-iodized food-grade salt among traders and food processors (see chapter 4).

7. Conclusions

The main findings on implementation status of various components of the National IDD elimination programme and USI in Armenia allow outlining the following main strengths and weaknesses.

Main strengths:

- USI strategy in Armenia is underpinned by several regulatory documents that ensure mandatory iodization of food-grade salt. Production and import of non-iodized salt for its use in households and food industry is prohibited; internationally approved iodine standard is set and maintained; proper salt iodization levels are attained.
- Total supply of domestically produced and imported iodized salt for use by households and food industry is currently sufficient. Avan Salt Company (ASC) continues to remain a strong proponent of USI; the ASC dominates the salt market; it consistently and adequately iodizes its edible salt production and, thus, largely contributes to the maintenance of optimum iodine nutrition in the population.
- RA DHS and the MoH/NCDC regular external monitoring indicate that throughout recent several years almost all households (> 97%) in Armenia consume adequately iodized salt (at the table and for cooking).The SFSS has proceeded to inspecting/monitoring of iodized salt in the markets and food industry.Iodized salt products are available at all food stores and are largely used by food processors
- Population-representative UI survey (biomonitoring, conducted recently with external assistance) confirms that the country's population has adequate iodine nutrition and is protected against iodine deficiency. NCDC, the major public health institution in the country, created a universal laboratory network operational since mid-2016, with a modern National Reference Laboratory (NRL) on top and having capacity to follow up UI assays in the future.

Main weaknesses:

- Regulations in support to USI in Armenia are scattered thought out several normative acts – government decrees, action plans, and ministerial orders. The monitoring of the

iodine content in household salt and in the salt at retail and food processing levels is implemented in health (NCDC) and agriculture (SFSS) sectors respectively, and the latest UI biomonitoring– by YSMU of education sector (though again with external support).Every sector deals with its own component: an overarching and updated action plan to have the above stakeholders across the board does not exist.The regulatory provision in Go A decree No 353-N, permitting use of non-iodized salt in food processing is not so far addressed (at least, to avoid using non-iodized salt in bread baking).

- The National IDD elimination programme and USI strategy in Armenia does not enjoy an overriding mechanism (an intersectoral committee or a board) to coordinate this effort within and beyond the health sector.The MoH Multidisciplinary Working Group, established and effectively functioning at the start of the national programme, is not revived, yet; IDD elimination programme manageris not appointed.The strategy lacks joint collaborative oversight.
- NCDC regular salt monitoring at household level encompasses an enormous amount of salt analyses- thousands per year, though no incompliance throughout recent years is found (DHS and other studies do); apparently, the quality of the product from the supply source is certain (most probably, ASC “Extra” table salt), however, the source and type of salt is not specified, the frequent salt quality control strategy is not revised. SFSS scarce data on monitoring of the salt in retail system and food industry (since 2017)is not accompanied with information on sources, types of the salt, sampling site, other, and is not accessible at SFSS website; apparently, salt of foreign sources is not the main focus(an imported salt sample was found labeled as iodine fortified, but the content did not match the label; hence, the work of SFSS officers is needed).
- Notwithstanding the preferred practice of using iodized saltin food processing, many food processors do not appear to have a fair level of knowledge about iodine as an essential element for proper functioning of thyroid gland, about IDD and their prevention through use of salt as a vehicle for iodine.There are no plans for targeted communication activities to address lack of knowledge and/or misperceptions that support demand for non-iodized salt among traders and food processors.
- Notwithstanding the availability of a modern laboratory network in the country, a specialized laboratory to conduct regular UI studies is still absent.

8. Main recommendations

As Armenia achieved national USI and elimination of IDD (reiterated in this report),theassessment of implementation status of various components of the National IDD elimination programme is aiming to provide several additional steps on the way forward (towards strengthened sustainability), with the following recommendations:

- The MoH in cooperation with the Ministry of Agriculture should address the gap in regulatory provisions of mandatory salt iodization (decree No 343) – the one that makes ***exception for use of non-iodized salt based on food production technology*** (without specifying it) and achieve a "true USI strategy," that encompasses the entire supply of salt destined for both the households and the food industry. The SFSS should reflect (in audit instructions) the irrelevance of the above exception to the salt in widely used processed food, first and foremost to the salt in commercial bread production - the major staple food in Armenia(and the best vehicle for iodine). Universal use of iodized salt in bread-baking will contribute to equal access of all population groups to iodine-fortified salt.
- The MoH should re-establish the Multidisciplinary Working Group (MWG) and appoint an IDD elimination programme manager to ensure the USI strategy oversight that aims at bringing the stakeholders together to jointly manage the progress, discuss emergent information, make decisions on barriers, and promote public accountability by regular publicity.To this end, the major stakeholders (NCDC and SFSS)need to strengthen the latest regulatory document on USI -the Joint Order of the MoH and the Ministry of Agriculture (2016),amending it with additional provision to include MWG Chair, members from sectors and partners – health (NCDC, IAC), agriculture (SFSS), economy, YSMU, salt industry (ASC), representatives of traders' and food manufacturers' associations, media and consumer NGOs (a sample ToR is presented in Annex 6). The MWG should convene quarterly meetings to review data from USI monitoring (from NCDC and SFSS), as well as an annual forum to discuss achievements and needs and to promote information dissemination (not only limited to formal exchange of summary data between NCDC and SFSS).
- The system for assessment of iodine nutrition (biomonitoring) should be strengthened to ensure sustainability of elimination of iodine deficiency for future generations. To this end, the MoH needs to strengthen the monitoring capacity to include urinary iodine

assays at the newly-established modern National Reference Laboratory of the MoH/NCDC.

- Communication on USI strategy should be part of IEC activitiesat the MoH/NCDC and Public Relations Unit, SRSS, YSMU.Targetedcommunication activities should be envisaged, specifically to address lack of knowledge and/or misperceptions that support demand for non-iodized food-grade salt among traders and food processors (at this stage, the NCDC and SFSS need to develop a leaflet/poster for bakeries stressing "Salt is good for health when less but iodised").

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Annex 1.

Deliverables and the timeframe of the project on assessment of implementation status of various components of the National IDD elimination programme in Armenia (reviewing progress towards elimination of IDD and universal salt iodization)

Deliverables

Report with draft recommendations, including:

- Information on current regulatory framework, including recommendations for development/strengthening of multi-sectoral coordination mechanism and formation of multidisciplinary IDD group or committee,
- Recommendations for improving of official health data collection and reporting (prevalence and incidence of thyroid disorders) at primary health facility level, including updated information for 2015-2016 with recommendations for establishment of IDD monitoring capacity (including urinary iodine assays) at the newly-established National Reference Laboratory of the MoH.
- Information on supply of domestic and imported food-grade salt, including identification of loop-holes for supply of non-iodized salt, and recommendations to prevent leakage of technical salt to food market,
- Recommendations for development of IEC materials for health care providers and general population specifically addressing misperceptions that support demand for non-iodized food-grade salt.

Project timeframe

01 July 2017 – 30 November 2017

Annex 2

Production and import of iodized food-grade salt in Armenia, 2013-2016.

Salt production/supply (MT per year)	**2013**	**2014**	**2015**	**2016**
Total domestic production/supply:	30,786	29,792	27,392	32,250
a) Food-grade iodized salt, including: -"Extra" quality vacuum salt - Edible rock salt, grind N2	14,347 295	15,456 294	14,463 306	14,952 303
b) Ground rock salt for deicing	9,786	7,227	6,602	11,471
c) Selective rock salt for animal consumption and, partially, for grinding/supply to food stores and food processors (including above amounts of ASC-produced iodized edible rock salt, grind N2)	6,358	6,815	6,021	5,525
d) **Total imported iodized salt** (in brackets – non-iodized salt)	2,638 (n/a)	1,952 (n/a)	3,021 (0)	2,771 (90 MT or 89905 kg packs)
e)Grand total of the domestic and imported food grade iodized salt supply (sum of lines on the points "a" and "d")	17,280	17,702	17,790	18,026

Annex 3

Types of food-grade salt supplied through retail food stores.

No	**Store category and name**	**Marz, city/district, village, address**	**Food-grade salt (iodized or non-iodized, grind, pack)**	**Supplier/packer**
1.	SP "Manvel Mkhitaryan"	5, Bakunts str. Yerevan, Arabkir	Iodized, "Extra" vacuum Iodized rock salt, 1 kg , grind 2	Avan Salt Company (ACS); the same
2.	SP Gegham Abelyan	6, Artsakhi str., Yerevan, Shengavit	Iodized, 'White gold" rock salt, grind 1, 1kg polyethylene bags Non-iodized rock-salt, 0,9 and25 kg packs	C/Z Salt Co, Iran, Import. DAAAR ltd. 150/20, Tichina str., Yerevan SP "S. Bayunts" (Avan, 20/3 Acharyan str.,26)
3.	SP "Susanna Poghosyan	Kotayk marz, v. Nor-Geghi, crossroad	Iodized, "Extra" vacuum Non-iodized rock-salt, large size, 0,7 kg	ASC; SP "Rudik Gasparyan" (1/15 Guy str, city Nor-Hajn)
4.	SP "Angin Lalayan"	5, v. Arzni, Kotayk marz	Non-iodized rock-salt, 0,9 kg pack	SP "G. Shamiryan", 1A/8 Rubinyants str., Yerevan
5.	Supermarket "Hajn"	6, Torozyan str. City Nor-Hajn, Kotayk marz	Iodized, "Extra" vacuum Iodized, 'White gold" rock salt, grind 1, 1kg bags Non-iodized rock-salt, 0,9 kg	ASC; C/Z Salt Co, Iran, Import./packer –DAAAR ltd. 150/20, Tichina str., Yerevan; SP "G. Shamiryan", 1A/8 Rubinyants str., Yerevan
6.	"ER FOOD" ltd, Food Supermarket "Bakalea"	62,Hanrapetutyan str. , Yerevan Kentron	Iodized, "Extra" vacuum Iodized, 'White gold" rock salt, grind 1; 1kg Non-iodized rock-salt, N2, 0,9kg	ASC C/Z Salt Co, Iran, Import./packer – DAAAR ltd. 150/20, Tichina str., Yerevan SP "A .Sahakyan", 6 Lepsius str., bld.11, app 22, Yerevan
7.	"Supermarket" (food and other commodities)	8b, 101, Artsaki str., Yerevan, Shengavit	Iodized, "Extra" vacuum Iodized, rock salt, 0,9 kg, gr. 2 Iodized, rock salt, 1 kg, grind1	ASC; the same "ARTEMSOL", UKR ,c.Soledar.Imp.: "OGA-BRIZ" ltd., Yerevan, 14, Arin-berd str.
8.	Market "Under the bridge"	v. Parakar, Armavir marz	Iodized, "Extra" vacuum Iodized, rock salt, 0,9,kg, gr. 2 **Iodized** (in Armenian, ?) salt "Iletskaya" for cann., 1 kg	ASC; the same; "Russol" ltd., Orenburg obl., c.Sol-Iletsk

9.	SP Victoria Gharibyan	1/A, V. Kostanyan str., Vagharshapat, Armavir marz	Iodized, "Extra" vacuum Non-iodized rock-salt, 0,9 kg pack, grind 2	ASC; SP "G. Shamiryan", 1A/8 Rubinyants str., Yerevan
10.	SP Hovik Poghosyan	36 Acharyan str., Yerevan (Avan)	Iodized, "Extra" vacuum Iodized, 'White gold" rock salt, grind 1, 1 kg Iodized, rock salt, 1 kg, grind 1	ASC; C/Z Salt Co, Iran, "ARTEMSOL", UKR, c. Soledar. Import.: "Alex Star" ltd., Tavush
11.	SP Vachagan Petrosyan	58, Hanrapetutyan str., Yerevan, (Kentron)	Iodized, "Extra" vacuum Iodized, rock salt, 1 kg, grind 1	ASC; "ARTEMSOL", UKR, Soledar. Importer: "OGA-BRIZ" ltd.
12.	"Yerevan City" Network of supermarkets	10, Tigran Mets str. Yerevan, (Kentron)	Iodized, "Extra" vacuum Iodized, rock salt, 0,9 kg, N2 Iodized, 'White gold" rock salt, grind 1, 1kg bags Iodized, rock salt, 1 kg, grind 1	ASC; the same; Producer – C/Z Salt Co, Iran, "ARTEMSOL", UKR ;
13.	SP Hrachya Harutyunyan (food store at Fair Market "Petak")	17a, Arshakunyats avenue, Yerevan	Iodized, 'White gold" rock salt, grind 1, pack 1kg Iodized (in Armenian, ?) salt "Iletskaya" for cann., 1 kg	C/Z Salt Co, Iran, Import. – DAAAR ltd. 150/20, Tichina str., Yerevan "Russol" ltd., c.Sol-Iletsk, Packer: "Pashar group"
14.	SP Anahit Apresyan (food store at the Fair Market "Surmalu")	15, Arshakunyats avenue, Yerevan, (Kentron community)	Iodized, 'White gold" rock salt, grind 1, pack 1kg **Iodized** (in Arm, ?) salt "Iletskaya" for cann., 1 kg	C/Z Salt Co, Iran, Import./packer – DAAAR ltd. 150/20, Tichina str., Yerevan "Russol" ltd., c.Sol-Iletsk Packer: "Pashar group"
15.	Brand store "Mush"	118, Tpagrichneri str. Yerevan (Kentron community)	Iodized, "Extra" vacuum **Iodized** (in Arm, ?) salt "Iletskaya" for cann., 1 kg Non-iodized rock-salt, grind 2, cardboard pack of 0,75 kg	ASC; "Russol" ltd., c.Sol-Iletsk; Packer: "Hamov" ltd SP "A.Sahakyan", 6 Lepsius str., bld.11, app 22 Yerevan
16.	"Nor Zovk" Network of supermarkets	52/140 Babajanyan str., Yerevan (South-West community)	Iodized, "Extra" vacuum Non-iodized rock-salt, 0,9 kg Non-iodized salt "Green farm", small size, 04 kg bag Marine salt, various packs	ASC; SP "G. Shamiryan", 1A/8 Rubinyants str., Yerevan Producer "Broccoli" ltd., 9/u Kochinyan str., Yerevan Produced in Russia
17.	"Lil Grig" ltd Food store	Fuchiki str., Yerevan (Achapnyak)	Iodized, "Extra" vacuum Iodized, rock salt, 1 kg, grind 1	ASC; "ARTEMSOL", UKR , c. Soledar; Imp: "OGA-BRIZ", 14, Arin-berd

18.	"Kaiser" Supermarket	23/6 Margaryan str., Yerevan (Achapnyak community)	Iodized, "Extra" vacuum Iodized, rock salt, 0,9 kg, N2 Iodized, 'White gold" rock salt, grind 1, 1kg (plastic& paper), 0,5 kg (plasmas) 2 types of marine salt with sodium iodine at **10 mg/kg**	ASC; the same; Producer (all): C/Z Salt Co, Iran, Import./packer – DAAAR ltd. Exporter: Spain
19.	"Mini Market" ltd	16, Margaryan str., Yerevan (Achapnyak)	Iodized, "Extra" vacuum, 1kg Iodized, rock salt, 0,9 kg, N2 Non-iodized rock-salt, grind 2, pack of 0,75 kg	ASC; the same; SP "A. Sahakyan", 6 Lepsius str., bld.11, app 22 Yerevan
20.	"Hatik" food store	4, Safaryan str., Yerevan (Nor Nork community)	Iodized, "Extra" vacuum Iodized rock salt, 25 kg bag Iodized (Arm.?) salt Iletskaya Non-iodized rock-salt, 0,7 kg Non-iodized rock-salt, 0,9 kg	ASC; Produced in Iran; Producer: "Russol" ltd. SP "S.Bayunts", Avan, 20/3 Acharyan str., app. 26 SP "A.Grigoryan", 313/12 microshrjan, c.Hrazdan
21.	SP Tigran Vardanyan	34, Acharyan str., Yerevan (Avan community)	Iodized, "Extra" vacuum Non-iodized rock-salt, 0,7 kg Cardboard pack Non-iodized rock-salt, 0,8 kg, cardboard pack	ASC; SP "S.Bayunts"(Avan, 20/3 Acharyan str.,26) Ptoducer/packer not indicated
22.	SP Susanna Ginoyan	30, Acharyan str., Yerevan (Avan)	Iodized, "Extra" vacuum Non-iodized rock-salt, 0,9 kg cardboard pack	ASC; SP "S. Bayunts"(Avan, 20/3 Acharyan str.,26)
23.	SP Hasmik Ghayfajyan	62 Harapetutyan str., Yerevan (Kentron)	Iodized, "Extra" vacuum, 1 kg Iodized, rock salt, 0,9 kg polyethylene bag, grind 2	ASC; ASC;
24.	"Nor Nork" Supermarket	8/2 Guy avenue (Nor Nork community)	Iodized, "Extra" vacuum, 1 kg Iodized, rock salt, 0,9 kg, N 2 Iodized, 'White gold" rock salt, grind 1, bags of 1kg Iodized, rock salt, 1 kg, grind 1 Non-iodized rock-salt, 0,9 kg	ASC; ASC; C/Z Salt Co, Iran, Import./packer – DAAAR ltd.; "ARTEMSOL", UKR , Soledar; Importer: "OGA-BRIZ"; SP "G. Shamiryan", 1A/8 Rubinyants str., Yerevan

25.	"SAS" Supermarket	21, Kajaznuni str., Yerevan (Kentron community)	Iodized, "Extra" vacuum, 1 kg Iodized, rock salt, 0,9 kg plastic bag, grind 2 Iodized, rock salt, 1 kg, grind 1 Iodized (15-20 mg/kg), Alpine salt, polyethylene bag, 1 kg	ASC; ASC; "ARTEMSOL", UKR , Donetsk Prod.:Kotanyi GmbH, Austria, Imp: OOO Kotani, RF
26.	SP Artak Mkrtchyan	76/5,Hanrapetutyan str. , Yerevan (Kentron)	Iodized, "Extra" vacuum, 1 kg Iodized (Arm.) salt "Iletskaya" for cann., 1 kg Non-iodized rock-salt	ASC; "Russol" ltd., Orenburg obl., .c.Sol-Iletsk; SP Armen Hakobyan
27.	SP Arthur Galstyan	27/111 Mamikonyants str., Yerevan (Arabkir)	Iodized, "Extra" vacuum, 1 kg Iodized, 'White gold" rock salt, grind 1, 1kg Iodized, 'White gold", refined	ASC; C/Z Salt Co, Iran, (DAAAR) 150/20, Tichina str., Yerevan; The same
28.	Supermarket "Karusel"	21, Mamikonyants str., Yerevan (Arabkir)	Iodized, "Extra" vacuum, 1 kg Iodized salt "Iletskaya" for cann., 1 kg, cardboard bag Non-iodized rock-salt, grind 2, pack of 0,75 kg	ASC; "Russol" ltd., Orenburg obl., .c.Sol-Iletsk; SP "A.Sahakyan", 6 Lepsius str., bld.11, app 22 Yerevan
29.	Supermarket "Nor Tun"	25/1, Mamikonyants str., Yerevan (Arabkir)	Iodized, "Extra" vacuum, 1 kg Iodized, rock salt, 1 kg, grind 1 Non-iodized rock-salt, 0,6-0,7 kg bags without labels	ASC; "ARTEMSOL", UKR , Donetsk Source not indicated, packed in the store
30.	"Yerevan City" Network of supermarkets	60/2, Komitas avenue, Yerevan (Arabkir)	Iodized, "Extra" vacuum, 1 kg Iodized, rock salt, 0,9 kg Iodized, 'White gold" rock salt, grind 1, bags of 1kg Iodized, 'White gold", refined Iodized, rock salt, 1 kg, grind 1 Marine salt	ASC; ASC; C/Z Salt Co, Iran, Import. /packer – DAAAR ltd. The same "ARTEMSOL", UKR , Donetsk Exporter: Spain
31.	SP Susanna Harutyunyan	12/24 Kievyan str., Yerevan	Iodized, "Extra" vacuum, 1 kg Iodized, 'White gold" rock salt, grind 1, 1kg bags Non-iodized rock-salt, grind 2, pack of 0,75 kg	ASC; Producer – C/Z Salt Co, Iran, Import./packer – DAAAR ltd. SP "A. Sahakyan", 6 Lepsius str., bld.11, app 22, Yerevan
32.	"SpitakTun TAS" ltd	56/45, Mamikonyants str, Yerevan (Arabkir)	Iodized, "Extra" vacuum, polyethylene bags of 1 kg	ASC

Total: stores – 32; salt samples - 93

Annex 4

NCDC data on monitoring of edible salt for iodine content in households, 2009 – 2016

N/N	Year	Total number of samples (per year)	Number of samples with levels beyond the national standard (40±15 mg/kg)
1.	2009	8073	10
2.	2010	6154	4
3.	2011	6107	2
4.	2012	12025	3
5.	2013	20777	3
6.	2014	14816	0
7.	2015	16449	0
8.	2016	13553	0

Annex 5.

Questionnaire for assessment of the extent of use of iodized salt in processed foods and the level of knowledge on iodine nutrition among food processors

This survey is being conducted for the goal of protecting the health of all of us.
Your expertise as a food processor is extremely valuable and we are asking for your assistance to complete the below brief questionnaire (provided you agree to participate). Please note, the information you provide to us will be compiled with responses from other food processors, and your name will not be associated with specific information. Several questions are provided with options, out of which one or more answers can be chosen.

Number_____ Date_____

1. Please specify the salt-containing product(s) you produce:
   Bread_____ Cheese_____ Pickles_____(other)_____.
2. Please specify if this food is frequently consumed (every day or almost every day) in your family, including close relatives:
   Yes_____ No_____.
3. Please specify if this food is supplied/sold to others:
   Yes_____No_____
   If "yes", please indicate average sales per year_____.
4. Do you purchase/use iodized salt for processing the specified food?
   Yes _____No _____Not sure_____
   If "yes", please give the main reason(s):
   a. Good for health_____
   b. Always available common salt_____
   c. A medical worker advised to buy_____
   d. Other_____
5. Do you use non-iodized salt for the product(s) you process?
   Yes_____ No_____ Not sure_____
   (For interviewer: If Q5-Yes, ask Q6, if No -skip Q6)
6. Please explain why iodized salt is *not* currently used in specified food products:
   a. It affects the food taste, appearance/consistence, else _____
   b. It is more expensive_____
   c. Not sure (I do not know why it is necessary)_____

d. Other _____

7. Which part of the body needs iodine for proper functioning?
   a. Kidneys_____
   b. Thyroid gland_____
   c. Pancreas_____
   d. Other_____
   e. Not sure_____
8. Have you ever heard of the effects of iodine deficiency on the human body?
   Yes _____ No _____
9. Have you ever heard/seen any kind of information on prevention of iodine deficiency in Armenia and the need/importance of salt iodization for that purpose?
   Yes _____ No _____
   (For interviewer: If Q9-Yes, ask Q10 and Q11, if No –go to Q12)
10. Where do you receive information about iodine deficiency and its prevention?
    a. Print media_____
    b. Television_____
    c. Medical worker _____
    d. Relatives/friends _____
    e. Other_____
11. When did you hear or read last about the need/importance of salt iodization?
    a. During the last month_____
    b. During the last year_____
    c. Several years ago_____
12. Where do you usually purchase salt?
    Iodized: At the store_____ Other_____
    Non-iodized: At the store_____ At the salt-producer shop _____Other_____

I have a personal question (provided you agree to discuss your personal data with me).

13. Your age: _____ Gender: _____Education:_____.

Interviewer _____

Marz _____ Settlement _____(urban, rural)

Food processing facility/person_____

Annex 6.

Terms of Reference
(of stakeholders for monitoring and oversight of USI strategy in Armenia)

- **Ministry of Health:**
  - Provide data on regular monitoring of food-grade salt at household level and ensure data interpretation (with information on geography of testing, sources and types of salt);
  - Identify specific needs for communication activities and implement IEC work on USI and sustained elimination of IDD;
  - Support and coordinate the work of the Multidisciplinary Working Group (MWG) to jointlymanage and evaluate the progress on IDD elimination programme and USI (convene quarterly meetings and an annual forum);
- **Ministry of Agriculture (SFSS):**
  - Provide data on regular monitoring of food-grade salt at retail and food industry levels and ensure data interpretation (with information on geography of testing, sources and types of salt);
  - Provide support for and participate in targeted communication work for salt traders and food manufacturers;
- **Ministry of Economic Development and Investments:**
  - Provide data on food-grade salt imports;
- **Yerevan State Medical University (Chief endocrinologists):**
  - Participate in evaluation of IDD elimination programme achievements and needs (interpretation of data on IDD recorded prevalence, burden of thyroid disease, development of diagnostic and treatment guidelines, review of data reporting forms, identify needs and conduct professional training activities);
- **Avan Salt Company (ASC):**
  - Provide data on domestic production and supply of food-grade salt and participate in assessment of overall salt supply situation in the country;
- **Salt Traders' and food manufacturers' associations, media and consumer NGOs:**
  - Participate in MWG meetings - in discussion of emergent information of interest, support organization of communication activities and participate in dissemination of information materials.