



SALT IODISATION IN VIET NAM:

**Learning from the Past and
Building Back Better**

Acknowledgements

UNICEF Viet Nam supported documentation and analysis of the history, achievements and current status of the salt iodisation programme in Viet Nam in order to learn from the past. It is hoped that these lessons will help shape the future of salt iodisation in Viet Nam.

This report was written by Karen Codling, public health nutrition consultant based on interviews with stakeholders of the salt iodisation programme in September 2012 and a review of a variety of documents, reports, evaluations, and surveys from the salt iodisation programme. The author also drew upon several years of personal experience with the Viet Nam salt iodization programme, including a programme assessment and field visits. Dr. Nguyen Vinh Quang, Vice Director, Hospital of Endocrinology; Dr. Le Phong, Vice Director, Centre for Subnational Directing & Training, Hospital of Endocrinology; and Mr. Nguyen Huy Quang, Vice Director, Legislation Department, Ministry of Health provided assistance in the writing of this review.

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- Photo on page 5, 15 taken in Dam Vua, Ninh Hai, Ninh Thuan. Photographer: Truong Viet Hung

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Acronyms

AusAID	Australian Agency for International Development
CEM	Committee for Ethnic Minority Areas
EQUIP	Ensuring the Quality of Urinary Iodine Procedures
HoE	Hospital of Endocrinology
HCMC	Ho Chi Minh City
IDD	Iodine deficiency disorders
IEC	Information, education and communication
KAP	Knowledge, attitudes and practice
KIO3	Potassium iodate
MARD	Ministry of Agriculture and Rural Development
MICS	Multi Indicator Cluster Survey
MoCI	Ministry of Culture and Information
MoH	Ministry of Health
MoIT	Ministry of Industry and Trade
NIDDC	National IDD Control
NSC	National Salt Corporation
PPCs	Provincial People's Committee
UNICEF	United Nation's Children Fund
UIC	Urinary iodine concentration
VFA	Viet Nam Food Administration
WHO	World Health Organization



Introduction

In 2005, more than 90% of Vietnamese households were using adequately iodized salt and the urinary iodine concentration level of women with children below five years of age was in the optimal range. A national law was in place requiring the iodisation of salt for human consumption and a strong monitoring system ensured the quality of iodisation. By most criteria Viet Nam had a strong salt iodisation programme and had eliminated a formerly severe iodine deficiency public health problem. However, just three years later, when a follow up national survey was conducted in

2008/9, household coverage was found to have fallen to 70% and urinary iodine concentration levels indicated inadequate iodine intake. This paper reviews the strengths and weaknesses of the original programme and the reasons for the decline after 2005. It discusses how lessons can be learnt from the past and from other countries in the region to ensure that an effective and sustainable programme can be re-established for the long-term elimination of iodine deficiency disorders in Viet Nam.

Salt Iodisation as a National Target Programme: 1993 - 2005

From as early as 1970, Viet Nam has had a programme to address iodine deficiency disorders (IDD). Initially, the programme was focused in 17 mountainous provinces where goiter rates were high (16-55%). At the time, the interventions were manually-produced iodized salt and iodized oil capsules. In 1993 however, a national survey was undertaken, which found 22% of school age children with goiter and a medium urinary iodine concentration of 32 µg/L in the same age group. This compares to a World Health Organization (WHO) recommendation that median urinary iodine concentrations should be above 100 µg/L.¹ On the basis of this data, the government extended the IDD Control programme to the whole country and issued Decision No. 481 which called upon the whole population to purchase and use iodized salt.² In 1999, the government replaced Decision 481 with Decree 19, which directed

the production of iodized salt. In a separate development, iodized salt was included in a list of subsidized essential commodities for minority communities.

The National IDD Control (NIDDC) Programme as implemented between 1993 and 2005 had a number of unique features. A high level of political commitment to address IDD was evident and the programme benefited from significant resources. Special systems were established to ensure the iodisation of salt and the access of priority communities to iodized salt. However it is now clear that the system established was unsustainable and many features of the programme that initially appeared as strengths and evidence of political commitment, in retrospect, now appear as weaknesses, which directly contributed to the collapse of the programme after 2005.

Political Commitment: The National IDD Control programme was designated a “National Target Programme”, which means it was a national priority programme with special funds and oversight. It was managed by the Central IDD Committee, which was situated within

1 WHO, UNICEF, ICCIDD. Assessment of iodine deficiency disorders and monitoring their elimination. A guide for programme managers. Third Edition. WHO 2007

2 Decision No. 481/TTg of the Prime Minister dated September 1994 on organizing and calling upon all people to buy and use iodized salt.



the Ministry of Health (MoH) and under the ultimate responsibility of the Vice Minister of Health. The Chair was usually the Director or Deputy Director of the Therapy Department of the MoH and the vice-chairs and secretary were usually from the Hospital of Endocrinology (HoE). Despite the existence of the multi-sectoral Central IDD Committee however, the NIDDC programme was run very much as a health programme, with limited collaboration with other Ministries such as the Ministry of Agriculture and Rural Development (MARD) or Industry and Trade (MoIT), which were both very much involved in salt production, or even the Committee for Ethnic Minority Areas, which administered the subsidy programme for iodized salt (further discussed below).

At provincial level, the IDD programme was the responsibility of the Provincial People's Committee. The Provincial Primary Health Care Committee functioned as the provincial IDD Committee, and was often chaired by the Vice Chairman of the Provincial People's Committee. The IDD department was usually housed in the Provincial Preventative Health Centre and operated as the focal point of the IDDC programme of the province.

Legislation: Decree 19 on the Production and Supply of Iodized Salt for Human Consumption³ was issued at the request of the MoH and comes under the Law on the Protection of People's Health. It was supported by an inter-ministerial circular of 20 November 1999 with Guidelines on the "Implementation of Government Decree 19/1999/ND-CP". The Decree aimed to eliminate iodine deficiency and IDD by regulating the production and supply of iodized salt for human consumption. It specified that all salt for direct human consumption and "salt used in food processing" must be iodized. It excludes however "common salt" which includes "grain salt, refined salt, crushed salt, pit salt and other types of salt produced from sea water or exploited from salt mines". In other words Decree 19 appears to require that salt marketed for direct human consumption (and food processing) is iodized but all other salt is excluded. This could include salt that in all other ways resembles salt for direct human consumption, e. g. refined, packaged salt. Thus Decree 19 did

³ Decree No. 19/1999/ND-CP dated April 10, 1999 on the Production and Supply of Iodized Salt for Human Consumption.



not require the iodisation of all salt for human consumption and did not enable the banning of non-iodized salt for human consumption.

Decree 19 specified the roles and responsibilities of government ministries and production facilities with respect to “edible salt” which is essentially “common salt that has been iodized”. As such Decree 19 applies to all salt that is iodized. Moreover it requires that all producers of edible salt (i.e. iodized salt) must apply for and be granted a ‘certificate of eligibility and qualification’ from the MoH. The requirement for a ‘certificate of eligibility and qualification’ is in addition to the normal business registration and is thus an extra step that producers of iodized salt must go through, which does not apply to producers of common (or non-iodized) salt. In addition, producers of edible (iodized) salt must have an internal quality control system (including

“necessary instruments and chemicals for testing each production batch”) and meet established hygiene and quality criteria. Decree 19 prohibits salt producers from procuring their own KIO₃ however; they may only access KIO₃ from the NIDDC, through the HoE. The outcome of Decree 19 was thus the creation of a separate system for the production of iodized salt, rather than incorporating iodisation into the routine system for production of salt for human consumption. Moreover, producers of iodized salt had to comply with several more requirements than producers of other salt, and are closely monitored by, and dependent on the NIDDC, which was potentially a deterrent to some salt producers.

A further problem of Decree 19 is that it is ambiguous about whether salt for food processing, should be iodized. Although it specifies that “salt used in food processing” must be iodized, no definition of this term was provided and it was interpreted by many as meaning ‘salt used in cooking’. The Guidelines for the Decree encourage use of iodized salt for animals (article 1.5 reads “Using human consumption salt in livestock and animal breeding is encouraged”) but it says nothing about iodized salt for food processing. As will be discussed further, this is a major limitation of Decree 19 because use of ‘salty condiments’ in place of ‘table salt’ is widespread in Viet Nam.

Salt production and iodisation system: Salt is produced throughout the country from sea salt and mined rock salt, with the majority produced in the South by solar evaporation. It is produced by a mixture of private producers, producers that are part of the National Salt Corporation (NSC) of Viet Nam (a state owned corporation) and provincial government authorities. The NSC produced about 30% of national salt production in 2003. A list of all salt producers did not exist although it is known that Viet Nam produces about 1 million tons of salt per year, with only about 300,000 tons of that going for direct human consumption. The remaining amount is used by industry (200,000 tons), for animal consumption or food processing (400,000 tons) and export (100,000 tons). Imports of salt are controlled and only

high-grade industrial salt can be imported under a quota system. Imports of food grade salt are not permitted.

Salt iodisation was undertaken by 75 registered producers in 2003. As noted above all producers of iodized salt must first be registered by the NIDDC programme. At the time, only 26 of these 75 registered producers were under the NSC and the rest were under provincial authorities or privately owned. All registered producers of iodized salt received free potassium iodate (KIO₃) for salt iodisation from the NIDDC. The HoE purchased KIO₃ based on the amount of KIO₃ required in the previous year and iodized salt producers must apply for the KIO₃ and go to Hanoi to collect it from the HoE if approved. In 2003, production of iodized salt was 206,501 tons, based on KIO₃ disbursements. This represented 71% of Viet Nam's estimated requirements of salt for human consumption. NSC facilities produced 55% of the iodized salt and private and provincial producers produced the rest. Available figures suggest that private and provincial producers were producing about 125,000 tons of non-iodized salt for human consumption (based on requirements of salt for human consumption) and the NSC produced an additional 11,000 tons of non-iodized salt for human consumption. Overall, under the system established, it was not possible to control the production of non-iodized salt for human consumption, as a total list of salt producers did not exist. The only way of controlling the availability of non-iodized salt for human consumption would have been through market monitoring which was not apparently a routine activity.

A further aspect of the salt production system in Viet Nam, at the time, was that while salt production overall was under the direction and assistance of MARD, the production of iodized salt was essentially managed and supported by the MoH. This organization essentially created two salt production systems in Viet Nam, with iodized salt seen as a 'special, health commodity' rather than one type of salt. In addition, there was a certain amount of competition between MARD and the MoH as the iodized salt programme was seen as limiting the salt trade and being bad for salt

farmers and the salt industry in Viet Nam. As already noted, collaboration between the MoH/HoE and MARD and the NSC was very limited and information was not routinely shared between the two.

Salt subsidy system: The coverage of iodized salt in Viet Nam at the time appears to have been significantly facilitated by a Government subsidy for essential items for people living in mountainous areas, off-shore islands and ethnic minority areas. Government Decree 20⁴ governs the "subsidy policy" for iodized salt (and other items such as seeds, fertilizer and lighting oil) and aims to ensure that people living in subsidy areas can buy iodized salt for the same price as applied in mountain towns. Thus Decree 20 provides that subsidies can be applied for transport costs, the costs of mixing iodine with salt and for packaging costs. The subsidies were allocated to Provincial People's Committees (PPCs), which then passed the subsidies onto local salt iodisation facilities that were judged to be the best facility for producing iodized salt or to the NSC. The MoH administered the subsidy programme until 2000 and thereafter the Committee for Ethnic Minority Areas (CEM) administered it. The subsidy system benefited an estimated 12 million people in 2004 - 39% of Viet Nam's population. The subsidy was applied only to coarse grain iodized salt and not refined iodized salt.

In addition to applying the subsidy to supplies of iodized salt, PPCs were encouraged to introduce local regulations banning the production, sale and distribution of non-iodized salt. It does not appear however that there was any legal basis for such bans. Thus in subsidy areas, selected salt producers were paid to produce iodized salt and non iodized salt was banned from some subsidy areas, essentially ensuring household use of only iodized salt. Many provinces, such as Hoa Binh and Ha Giang in the North Mountain region, achieved 100% coverage with adequately iodized salt as a result of the subsidy system.

When the MoH administered the subsidy system, the budget, approximately US\$4

4 Government Decree No 20/1998/ND-CP dated 31 March 1998 on developing commerce in mountain areas, off-shore islands and in ethnic minority regions.



million, came directly out of the NIDDC budget but when CEM took over administration, the funds for the subsidy were transferred to the CEM and the NIDDC budget was reduced accordingly - from US\$5.1 million to US\$ 1.1 million.

Iodized salt quality assurance system: An extensive and effective internal and external quality assurance system was established for iodized salt. Internal quality assurance requirements were specified in Decree 19 and its guidelines and all registered iodized salt producers had an on-site laboratory in which they tested each batch of iodized salt by titration in order to ensure appropriate iodisation levels. At the time, salt was iodized at $40\text{ppm} \pm 5\text{ppm}$ at production level with the aim of having at least 20ppm at household level. In addition, a member of the provincial IDD department/unit visited regularly (usually twice per month) to take samples for titration testing in the provincial salt laboratory, which existed in all provinces. In 2003, 11% of the NIDDC budget (excluding the proportion spent on purchase of KIO_3) was spent on “inspection” which is taken to refer to quality

assurance monitoring. Therefore there was capacity and incentive to ensure accurate iodisation, although the objective of the external monitoring appear to be to undertake ‘additional checks’ on iodisation levels as opposed to verifying that internal quality assurance systems were functioning. Although data was not reported at the time,⁵ a survey undertaken in the South in 2008 recorded that only 7.1 of total household salt samples had inadequate levels of iodine (i.e. 5-15ppm).⁶ This data compares favourably to that from several other countries in the region, such as Indonesia and the Philippines where a significantly higher proportion of salt is iodized but does not meet national standards.

5 In national survey reports at the time, the proportion of households with adequately iodized salt was reported but not the proportion with non-iodized salt or inadequately iodized salt. It was therefore not possible to differentiate between non-iodized and inadequately iodized salt. As the national surveys measured each sample by titration however, it is obviously possible to extract this information from the raw data.

6 KAP Report on Iodine Utilization in Southern Provinces, Iodine Deficiency Status 3 Years after Completion of National Target Project on Goitre Prevention, HoE, December 2008



Information, education and communication:

Significant amounts of information, education and communication (IEC) on IDD and iodized salt were undertaken at all levels. Provincial health offices were guided, supported and funded to implement IEC activities such as the development of radio spots, posters and loudspeaker dissemination. Early on in the programme the main messages were concerning goiter, for example, “eat iodized salt to prevent goiter” and the 2000 national survey found that 99% of people knew that iodine deficiency caused goiter while only 21% knew that it caused mental retardation. The IEC focus on goiter was replaced by a focus on mental retardation however and by 2005/6 although 99% of respondents in the national survey still mentioned goiter as a consequence of iodine deficiency, 46% now knew that it also caused mental retardation. IEC efforts were not able to reduce reasons for consuming non-iodized salt however; in 2005/6 34% of people said they were ‘in the habit’ of using non-iodized salt and 24.5% said it had a bad taste and smell. In 2003, 33% of the NIDDC budget (excluding the proportion spent on KIO3) was spent on IEC.

Monitoring of programme achievements: An aspect of the Vietnamese NIDDC programme that was a clear strength was the monitoring and evaluation component. The monitoring system was developed with AusAID and Belgian support, with some input from UNICEF in 1995. It was written up and printed in a book that was widely available. The system consisted of surveys undertaken by provincial IDD committees three times per year – in April, July and October. Data was collected on household iodized salt coverage, use of other salty condiments, knowledge, attitudes and practices (KAP) and urinary iodine levels. The data, including the response to KAP questions, was sent to the central level for analysis, although titration of the salt was also done at the provincial level. Seven regional laboratories around the country were capable of measuring iodine levels in urine, with quality assurance coordinated by the National Laboratory in the HoE. The central level (HoE) sent the results of their analysis back down to the provincial level. In some cases the province would then report to the commune level. The three rounds of results were reported, by province, at the National IDD Meeting in November each year and in the Annual Report of the NIDDC Programme.

In addition, national surveys at household and school level were undertaken every three years. Household surveys were undertaken in 1997, 1998, 2000, 2003 and 2005/6 and school surveys were undertaken in 1993, 1998, 2000, 2003 and 2005/6. The surveys collected samples of salt from households⁷ for assessment of household coverage of iodized salt and urinary iodine data. In the household surveys the urinary iodine concentration (UIC) levels of women with children under 5 were collected (proxy for reproductive age women) and in the school surveys, UIC levels of school-aged children 8-10 years were collected. Goitre data (by palpation and ultrasound) was also collected from school surveys.

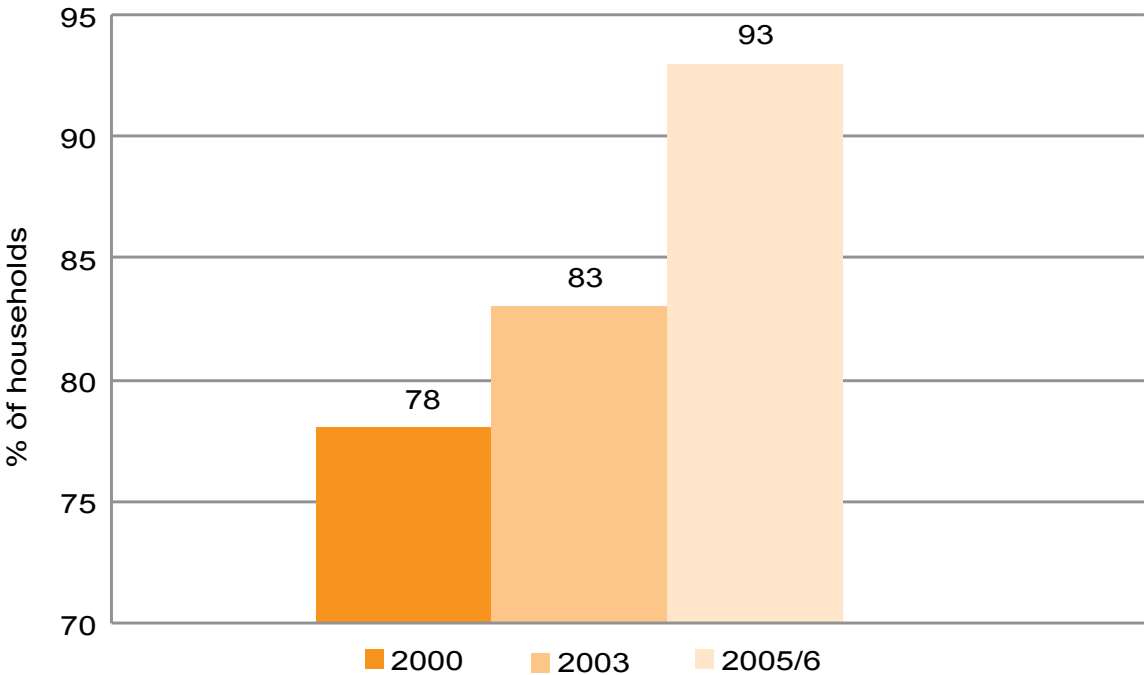
7 In the school surveys, students brought samples of salt from their homes

These two data collection systems generated significant amounts of data for evaluation of the success of the programme and the data, in particular the results of the household surveys, were used to fine tune the programme. For example, lower coverage was identified in the south and extra resources and additional programme activities were directed at southern provinces with some success. The tri-annual surveillance data appears to have been relatively under-utilized, although it correlated well with the national survey data. In 2003, 33% of the NIDDC budget (excluding the proportion spent on KIO3) was spent on monitoring. It is important to note however that the monitoring system was funded and supported wholly by the NIDDC. None of the monitoring activities were integrated into other existing systems. Thus when the NIDDC programme ended, all monitoring activities were stopped.

Achievements of the NIDDC 1993-2005

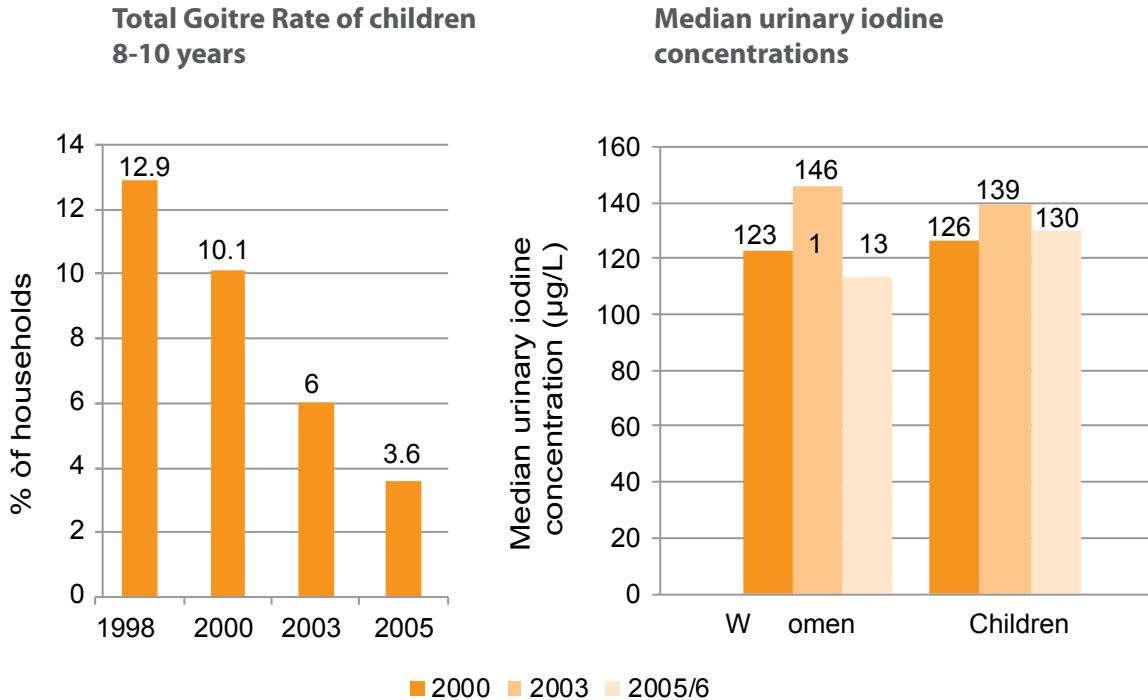
The NIDDC Programme enabled Viet Nam to achieve universal salt iodisation and to eliminate iodine deficiency disorders within a decade. Data from the national surveys of 2000, 2003 and 2005/6 indicate that household coverage of adequately iodized salt increased from 78% in 2000 to 93% in 2005/6. [See Figure 1] The international goal is >90%. As a result of the high coverage of iodized salt, median urinary iodine concentrations of both women and school aged children remained above the global recommendation of >100µg/L throughout the period. In addition, goiter rate in school aged children fell from 12.9% in 1998 to 3.5% in 2005/6. [See Figure 2] The global and national targets were to achieve a total goiter rate of less than 5%.

Figure 1: NIDDC Programme Achievements 1993-2005: Coverage of adequately iodized salt



Ref: Report on Iodine Deficiency Disorder Preventative Activities in Viet Nam, HoE July 2012.

Figure 2: NIDDC Programme Achievements 1993-2005: Health impact

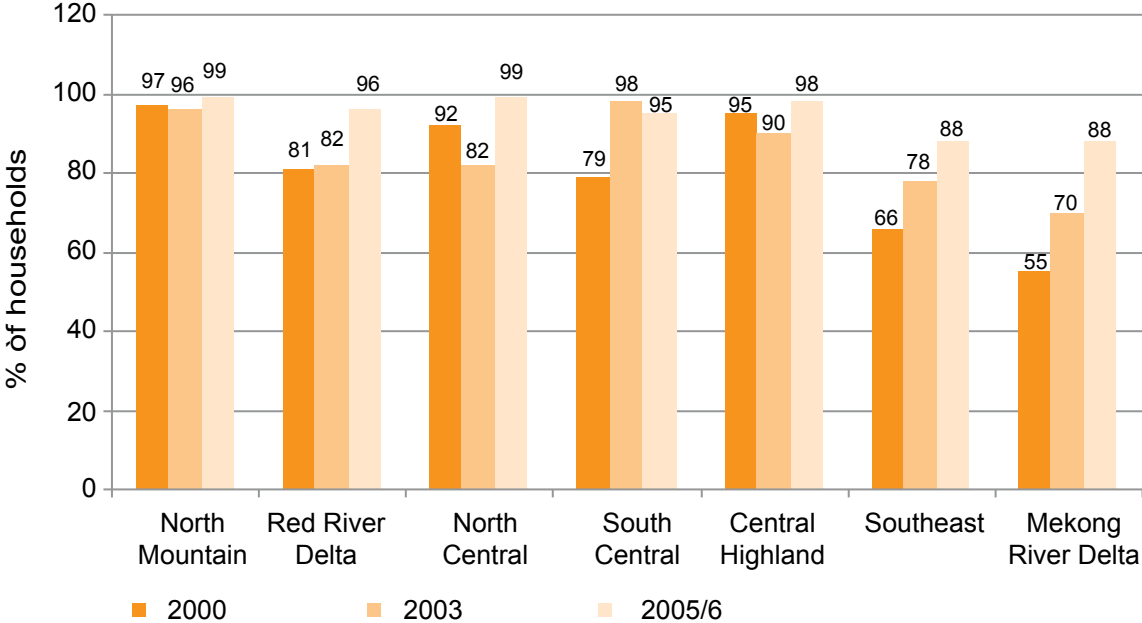


Ref: Report on Iodine Deficiency Disorder Preventative Activities in Viet Nam, HoE July 2012. NB. Optimal urinary iodine concentration for reproductive age women and children is shown in the grey area of the second graph.

A major concern during this period was lower coverage of iodized salt and urinary iodine concentrations in the Southeast and Mekong River Delta regions. Accelerated efforts were therefore implemented within these regions including increased information, education and communication and iodized salt quality assurance. Diversification of iodized products, for example to include iodized fish sauce, was also discussed. The situation improved as

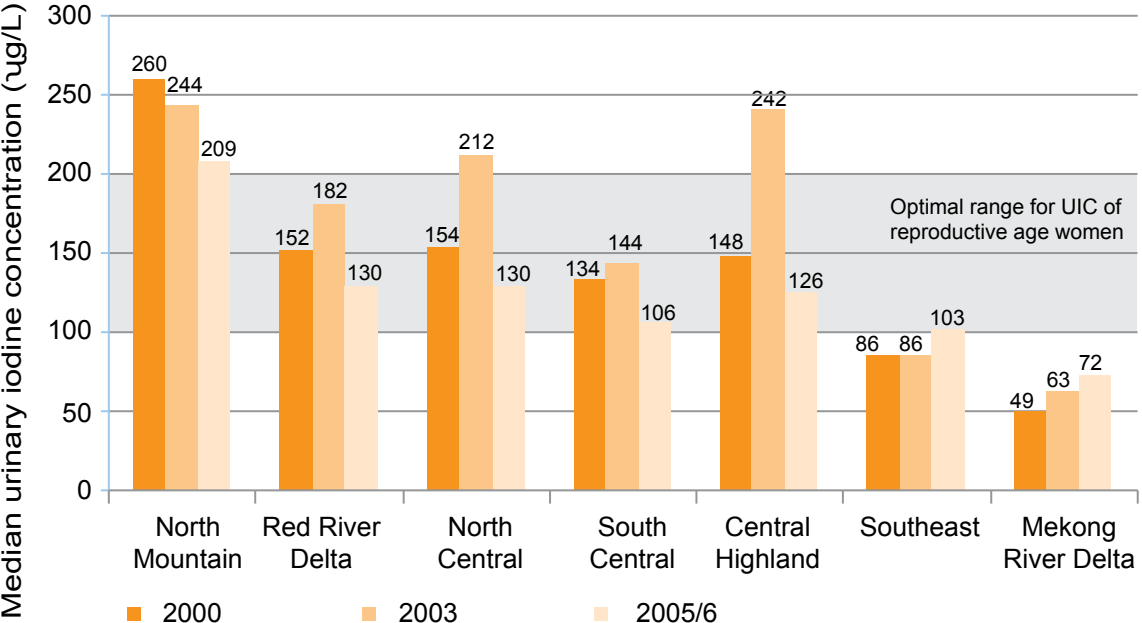
shown in the below figures, although even by 2005/6, universal coverage with adequately iodized salt (>90%) was not achieved and the median UIC of women remained below 100µg/L in the Mekong River Delta. [See Figure 3 & 4] The median UIC of school-aged children was also below global recommendations in the Mekong River Delta although total goiter rate was below the global and national target (<5%) in all regions (data not shown).

Figure 3: Consumption of Adequately Iodized Salt by Region



Ref: IDD Surveillance in Viet Nam for the Year 2000, NIDDC Programme; Knowledge, Attitude and Practices Survey on Iodine Deficiency Disorders Control in Viet Nam in 2003, HoE; Report on National IDD Survey 2005-2006, HoE

Figure 4: Urinary Iodine in Mothers of Children Under Five



Refs: Report on iodine deficiency disorder prevention activities in Viet Nam, HoE, July 2012



A further problem in this period was that processed foods were not made with iodized salt, as Decree 19 was unclear on this issue. Of particular concern was the fact that consumption of salty condiments, often in place of table salt, was widespread yet these condiments were generally not iodized or made with iodized salt. The national surveys that monitored the achievements of the NIDDC programme recorded that almost 100% of households in all regions of Viet Nam, except the North Mountain region, consumed fish sauce, and very little of this fish sauce was iodized. In addition, about half of all households in the North Mountain and Red River Delta regions consumed bot canh, a seasoning powder. Unlike other salty seasonings, the majority of bot canh was iodized however (data not shown).

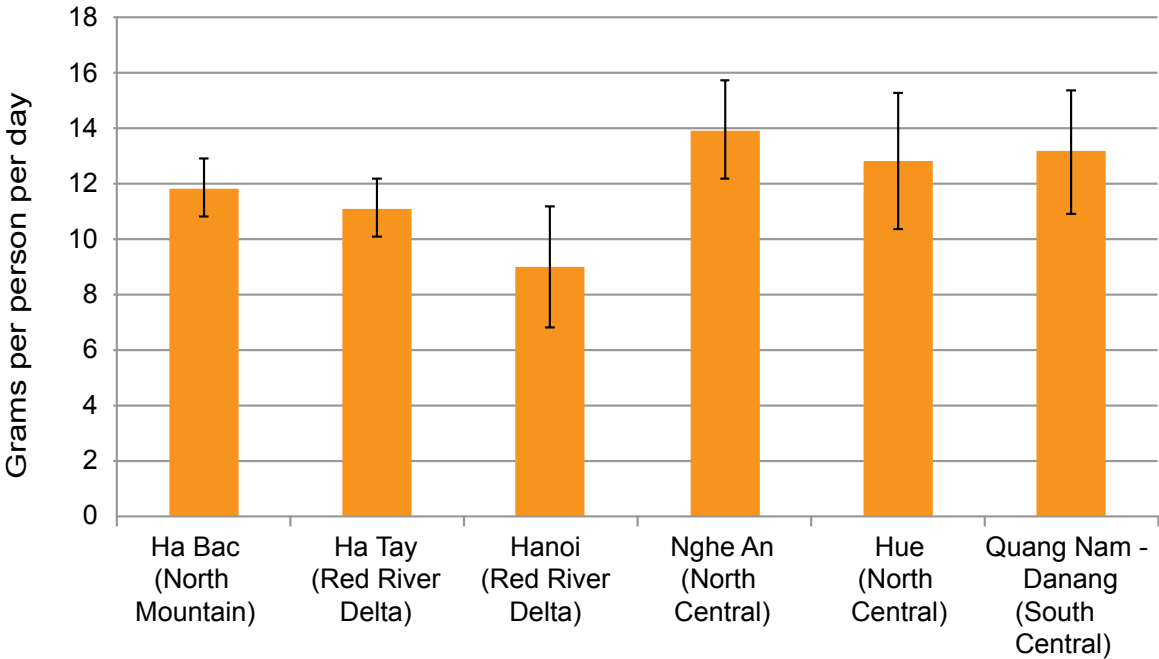
A study in 2004⁸ found that total salt consumption (including direct salt, salt from

fish sauce, seasoning salt [bot canh] and soya sauce) in the Mekong River Delta was $10.99 \pm 5.18\text{g/day}$, of which 5.06g came from salt and $3.6\text{g} \pm 2.33$ came from fish sauce. Thus about one third of total salt consumption in the Mekong River Delta came from fish sauce. The study went on to calculate that at current salt iodisation levels, people with this pattern of consumption would only achieve 50% of their iodine requirement. While Vietnamese people exhibit different consumption patterns of salt and salty condiments, another study showed that overall intakes of salt (from all sources) are relatively similar; consumption varied between 10-14 grams per person per day across six provinces.⁹ [See Figure 5]

8 Ta Van Binh et al. "Initial survey about situation of usage of salty spices in some regions in Mekong River Delta, 2004" from "Some scientific studies from national project done by the National Hospital of Endocrinology, 1969-2004", National Hospital of Endocrinology, Medical Publishing House, Hanoi.

9 National Institute of Nutrition, 1992

Figure 5: Total Salt Consumption in Selected Provinces in North and Central Viet Nam



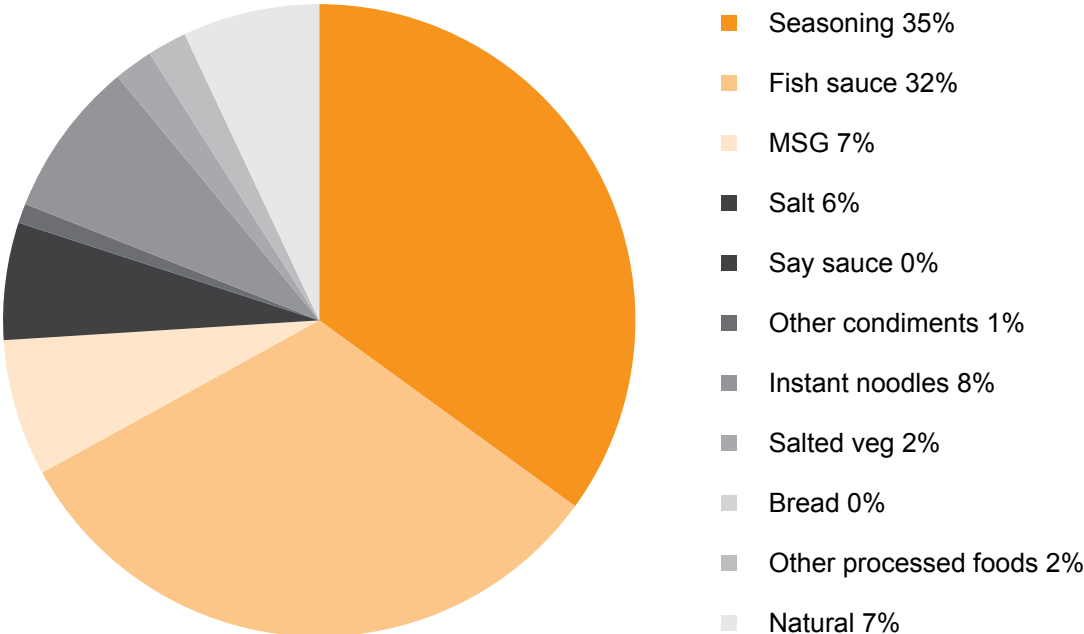
Ref: National Institute of Nutrition, 1992. NB. Region names are given in brackets below the province names

A further study of sodium intakes in a district of Hanoi found the mean salt intake to be 10.8 ± 3.3 g/day. The study also showed that seasoning (bot canh etc) and fish sauce made up 67% of sodium intake compared to just 6% from salt. Other processed foods contributed 11.6% of salt intake with the majority coming from instant noodles.¹⁰ [See Figure 6] The optimal way to ensure appropriate iodine intakes therefore is to ensure all foods, and in particular salty condiments, are made with iodized salt. This would be far easier and safer than trying to establish iodisation levels for different salty condiments in the absence of detailed information about salt and salty condiment consumption patterns of the Vietnamese population. A study has shown that losses of iodine from fish sauce made with iodized salt are minimal and there are no significant negative effects on the appearance or taste of fish sauce.¹¹



10 National Institute of Nutrition. Investigation of dietary sodium intake and sources in adults, aged 25-64 years. 2010
 11 Chanthilath et al. Iodine stability and sensory quality of fermented fish and fish sauce produced with the use of iodated salt. Food and Nutrition Bulletin, 2009.

Figure 6: Sources of Sodium Intake in Thanh Oai District of Hanoi



Ref: National Institute of Nutrition. Investigation of dietary sodium intake and sources in adults, aged 25-64 years. 2010

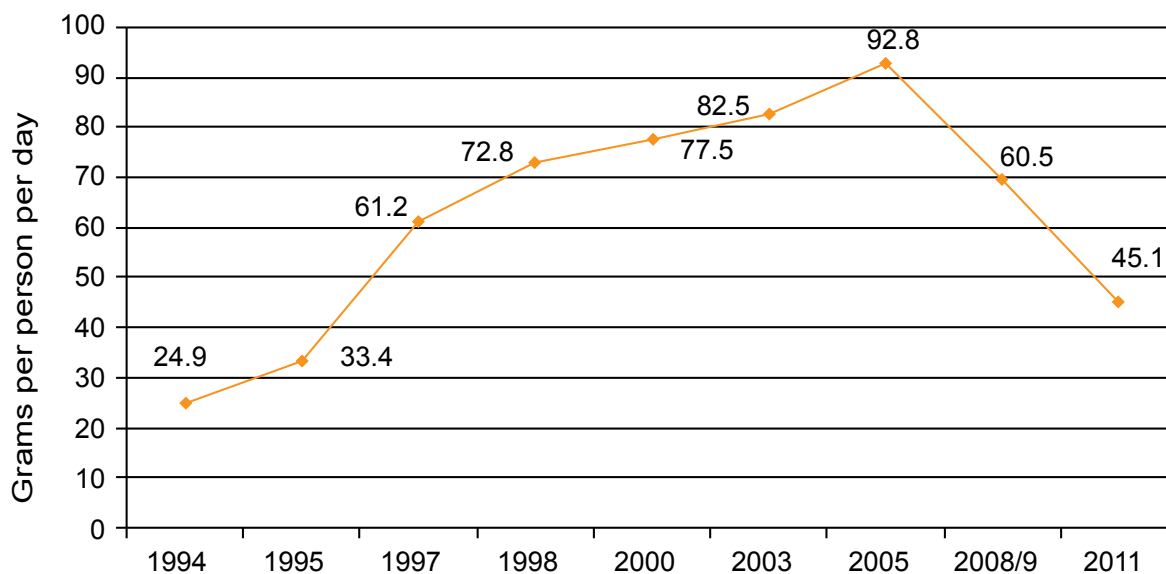


The Decline of Universal Salt Iodisation in Viet Nam: 2005 - 2012

With the release of the results of the 2005/6 national surveys which indicated that Viet Nam had achieved universal salt iodisation (>90% coverage with adequately iodized salt), that women's median urinary iodine levels, nationally and in five out of Viet Nam's seven regions, were within the recommended range and that the total goitre rate of children had declined below the national and global target of 5%, the Government of Viet Nam downgraded the NIDDC programme from a national target programme to a routine programme. This decision led to a change in management and

supervision structure, a cut in the budget and the issuance of a new Decree. It also led to a dramatic decline in iodized salt coverage and urinary iodine levels to the extent that IDD has re-emerged as a public health problem in Viet Nam. Nationally, median urinary iodine levels were 83µg/L in 2008, well below the optimal range of 100-199µg/L and lower than at any time in the last ten years. Less than half of all Vietnamese citizens are currently consuming adequately iodized salt. [See Figure 7]

Figure 7: Household Consumption of Adequately Iodized Salt

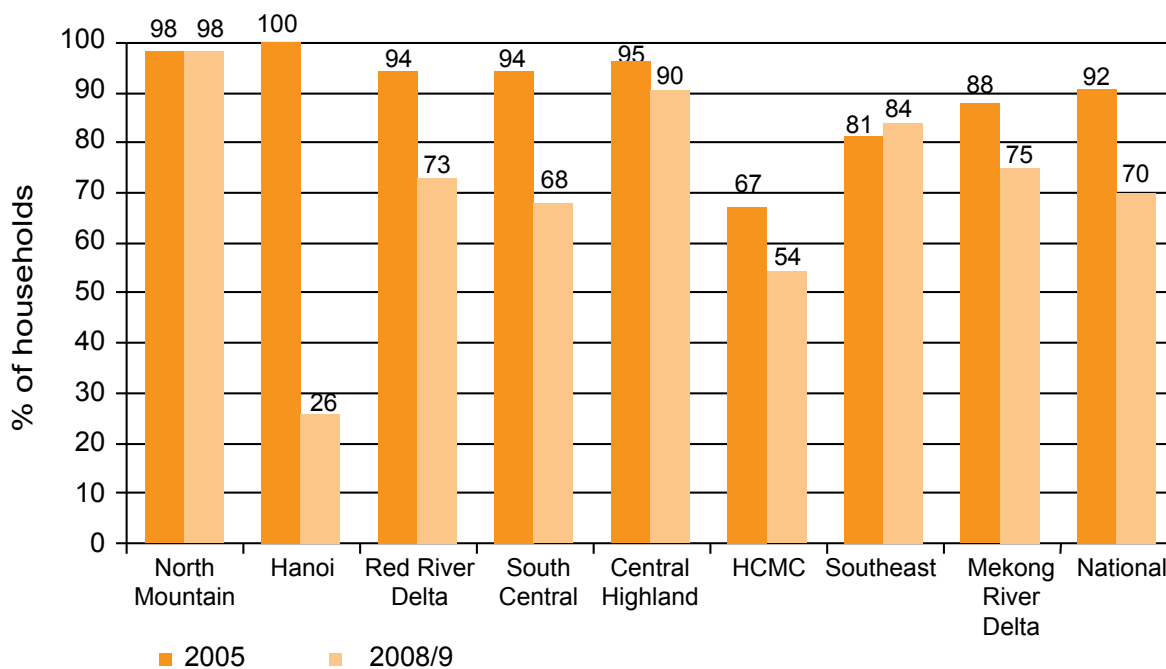


Ref: National IDD Surveys and Multiple Cluster Indicator Survey in 2011

Nationally, coverage of adequately iodized salt fell by about 20 percentage points from 92% to 70% between 2005 and 2008/9. In the North Mountain region it remained the same and in the Southeast it actually increased, possibly because of on-going efforts to increase iodized salt coverage in this region where coverage was formerly low. However, in all other

regions coverage has fallen and in Hanoi (not previously measured as a separate region in the national surveys), coverage has fallen from 100% to the lowest of any region, 26%. In Ho Chi Minh city the coverage is also very low at 54%. [See Figure 8]

Figure 8: Coverage of Adequately Iodized Salt, 2005 and 2008/9

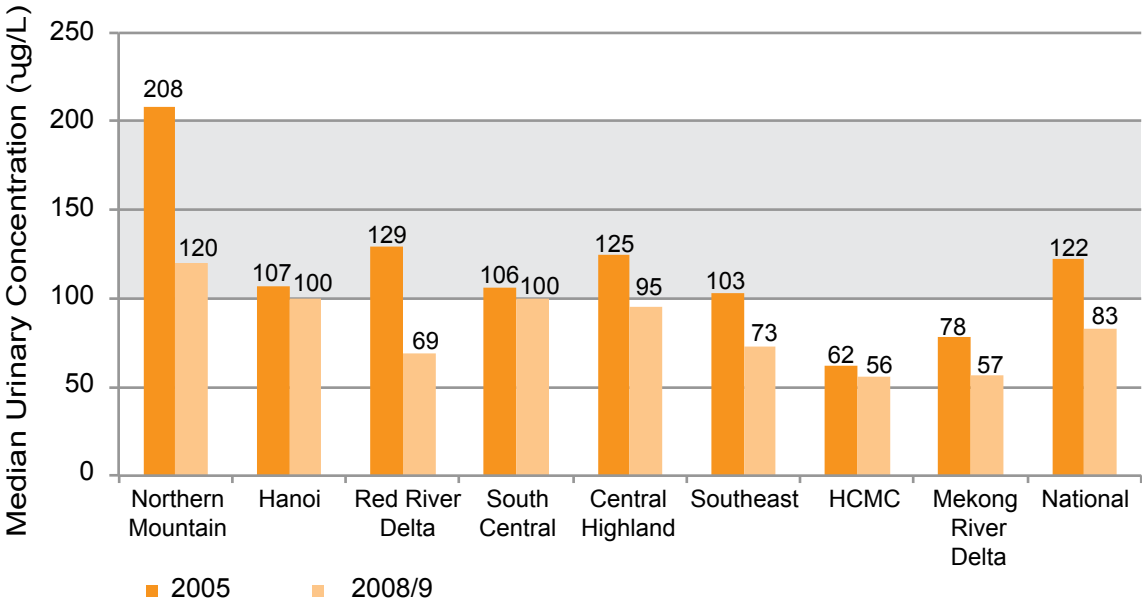


Ref: Report on IDD preventative activities in Viet Nam, HoE, July 2012

Urinary iodine levels have also fallen but not necessarily in line with the falls in iodized salt coverage. For example the biggest fall has been in the North Mountain region where iodized salt coverage was maintained while it has remained relatively unchanged in Hanoi, which had the biggest fall in iodized salt coverage. Regardless of the reason for the discrepancies, the end result of the falls in UIC, is that the women of every region, with the exception of the North Mountain region, were iodine deficient in 2008, compared to women in only two regions in 2005. [See Figure 9]



Figure 9: Median Urinary Iodine Concentration of Reproductive Age Women, 2005 and 2008/9



Ref: Report on IDD Survey 2008/9, HoE



The situation is even more alarming than the above figure indicates. Iodine is essential for the proper functioning of the thyroid gland. When iodine intakes fall below recommended levels, the thyroid may no longer be able to synthesize sufficient amounts of thyroid hormone with impacts on the developing brain of babies and other harmful effects, known collectively as iodine deficiency disorders. The most critical period in relation to iodine deficiency is from the second trimester of pregnancy to the third year after birth. Thus although iodine levels are often measured in school-age children or reproductive age women to give an indication of the iodine status of the community as a whole, the primary target for iodine programmes is pregnant women. Iodine deficiency in pregnancy leads to irreversible impairment of brain development in children.

Three small-scale studies, which measured the urinary iodine concentrations of pregnant women, were undertaken between 2008 and

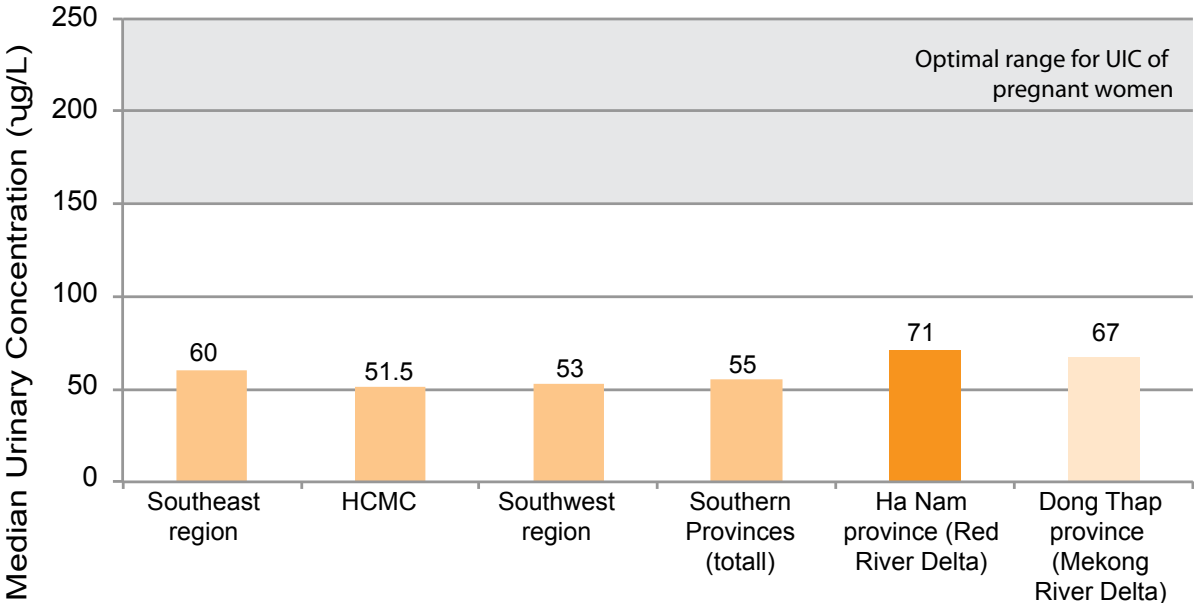
2010 in a number of different provinces and regions of Viet Nam. The studies reflect the situation in two regions in the South and in Ho Chi Minh city,¹² a province in the Mekong River Delta (South),¹³ and another in the Red River Delta (North).¹⁴ All indicate that the median urinary iodine concentrations of the pregnant women studied were far below the optimal levels. In addition, 83%, 70% and 78% of women in Ha Nam province, Dong Thap province and the Southern provinces respectively were found to have iodine concentrations less than the recommended minimum level of 150µg/L. [See Figure 10]

12 Hospital of Endocrinology. 2008 KAP report on iodine utilization in Southern provinces, iodine deficiency status 3 years after completion of national target project on goitre prevention. Hanoi, December 2008

13 Dong Thap Health Dept. Knowledge, attitude and practice (KAP) survey on iodized salt in Dong Thap province in 2009.

14 Fisher et al. Iodine status in late pregnancy and psychosocial determinants of iodized salt use in rural northern Viet Nam. WHO Bulletin. 2011

Figure 10: Median Urinary Iodine Concentration in Pregnant Women in three studies



Ref: (red bars) KAP Report on Iodine Utilization in Southern Provinces, ID Status 3 Years after Completion of National Target Project on Goitre Prevention, HoE, December 2008; (blue bar) Fisher et al. Iodine status in late pregnancy and psychosocial determinants of iodized salt use in rural northern Viet Nam, WHO Bulletin, 2011 (green bar) KAP survey on iodized salt in Dong Thap province in 2009, Dong Thap Health Department.

There are several reasons for the dramatic decline in the coverage of adequately iodized salt and urinary iodine concentrations.

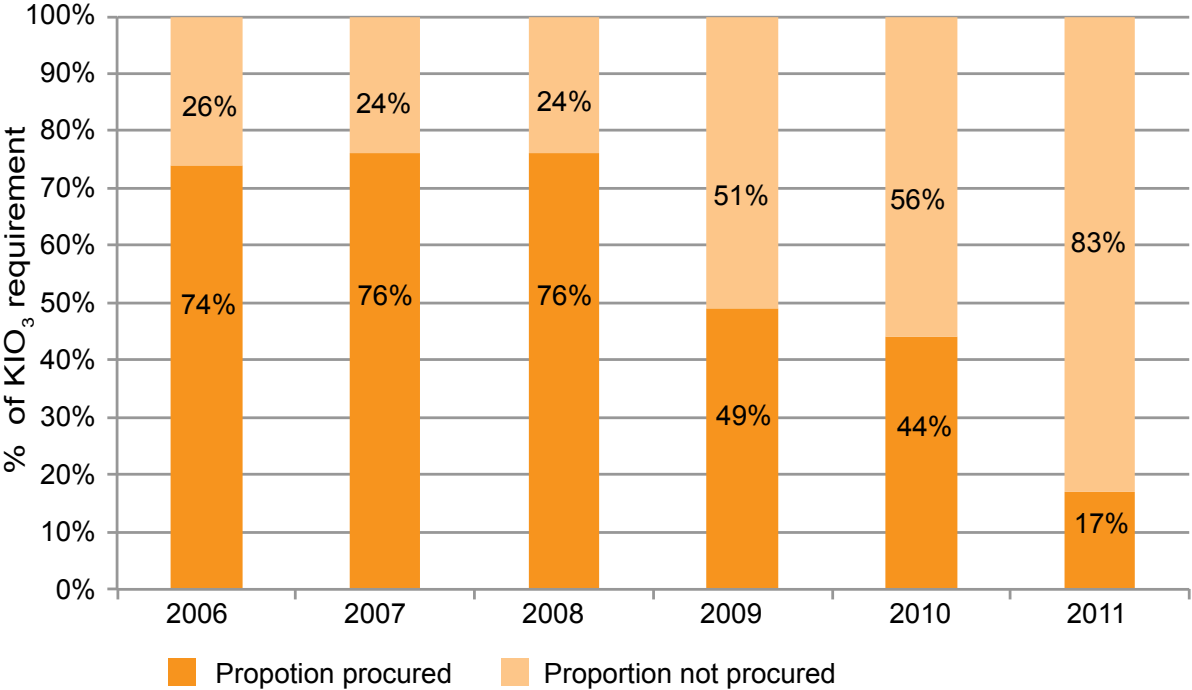
‘Downgrading of the programme’: As noted above, in 2005 the NIDDC programme was changed from a ‘national target programme’ to a routine programme of the public health sector. As part of this process the Central IDD Committee under the oversight of the Vice-Minister of Health was disbanded and the number of programme staff for the NIDDC Programme, mainly from the HoE, was scaled back. The HoE was assigned as the central level institution to advise and implement goitre control activities but many central level activities such as monitoring; training and supervision were drastically cut back due to budget and staff constraints. Maintenance of the regional and provincial urinary iodine laboratories was also constrained. Primary

responsibility for implementing the goitre control programme was transferred to the PPCs.

However, in 2009 the Training and Direction of Health Care Activities Centre (TDHCAC) of the HoE was assigned to implement the National Target Programme on Diabetes Prevention and Control. This enabled the HoE to re-start some of the activities of the IDD programme under the Diabetes programme. The Diabetes programme has also enabled the increase of the extent of IDD activities at provincial level and enabled the revival of some of the regional and provincial endocrinology laboratories.

The budget for the IDD programme was significantly reduced when it was downgraded from about US\$670,000/ year prior to 2005, to approximately US\$285,000 per year for the

Figure 11: Procurement of KIO3 by national requirement



Ref: Report on IDD preventative activities in Viet Nam, HoE, July 2012

period 2006-2011.¹⁵ The budget cut meant that funds were no longer transferred to the provinces for programme implementation and sufficient funding for total KIO3 requirements was no longer available. HoE figures suggest that procurement of KIO3 has declined to about 20% of national requirements. [See Figure 11] Insufficient budget for KIO3 has been exacerbated by large increases in the

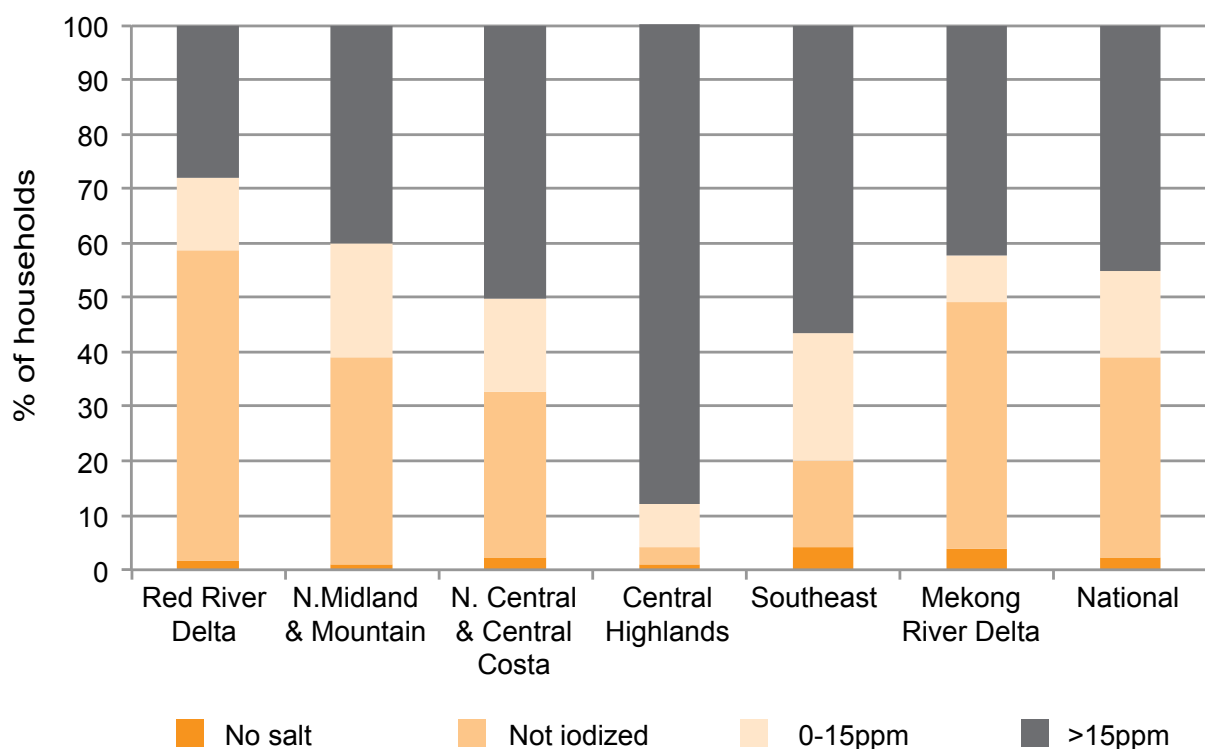
global price of KIO3 that occurred in 2009, 2010 and 2011. As KIO3 is a basic input to the salt iodisation programme, shortages in KIO₃ have had knock on effects, causing reductions in many other programme activities including monitoring and communication.

15 This compares to a budget of about US\$5 million pre 2000 when the budget for the subsidy programme was included in the NIDDC budget and a budget of about US\$ 1 million after 2000 when the budget for the subsidy programme was transferred to the CEM.

The shortage of KIO3 appears to have been a key reason for the decline in coverage of iodized salt recorded by the 2008/9 National Survey and the Multiple Indicator Cluster Survey (MICS) in 2011. Unlike previous HoE national surveys (which only reported coverage of adequately iodized salt), the MICS reported also on household usage of non-iodized and inadequately iodized salt (as measured by rapid test kits); the data indicate that in

2011 more than a third of households were using non-iodized salt (and 16% were using inadequately iodized salt). The proportion of non-iodized salt was particularly high in the North Mountain and Mekong River Delta regions. Whereas the Mekong River Delta has traditionally been a low coverage region, the North Mountain region had coverage above 95% between 2000 and 2005/6. [See Figure 12]

Figure 12: Household Consumption of Iodized Salt, 2011



Ref: Multiple Indicator Cluster Survey 2011, General Statistics Office

Alterations to the subsidy programme: The low iodized salt coverage in the North Mountain region is in all likelihood reflective of changes to the salt subsidy programme. Whereas previously the subsidy programme was administered by the CEM and subsidies for the production and transport of iodized salt were given directly to salt producers, in 2010, under Decision 120, the subsidies were instead given directly to the provinces. The PPCs were then supposed to procure subsidized items for

their population or they could give the funds directly to families to purchase normally priced goods. Several provinces have reportedly elected the latter option but families are not necessarily using the funds to purchase iodized salt. The new system also means that some salt producers are no longer receiving orders for iodized salt for the subsidy programme and have either switched to producing non-iodized salt (especially due to the shortage of KIO3) or have closed down altogether because they



have lost the competitive advantage they benefited from under the subsidy system. The total budget for the subsidy system from the central level may also have been reduced, with provinces expected to make up the difference.

Replacement of Decree 19 with Decree 163: A further reason for the decline in iodized salt coverage is that Decree 19, was replaced with Decree 163 in December 2005. Despite the weaknesses of Decree 19, Decree 163 is significantly weaker. It is also concerned with the “production and supply of iodized salt for human consumption” but unlike Decree 19, it is does not call for the iodisation of salt for human consumption. Rather it establishes “conditions for the production and supply of adequately iodized salt for human consumption” and indicates the roles and responsibilities of the MoH, MARD, Ministry of Industry and Trade (MoIT), the Ministry of Culture and Information (MoCI) and the People’s Committees in ensuring that iodized salt is available. Decree 163 set conditions and standards for salt

iodisation to ensure that iodized salt is of high quality and hygienic and it prohibits the “production, circulation and trading of fake iodized salt and iodized salt of poor quality.” It also calls on the MoH and MoCI to encourage people to use iodized salt but it does not require the iodisation of all salt for human consumption (or food processing) and also does not require the MoH to provide free KIO₃. While the latter could be seen as an advantage in that it allows salt producers to purchase their own KIO₃ (which was previously not allowed under Decree 19), it does not seem to be clearly recognized by either HoE or salt producers that this is now allowed. No Ministerial Circular was ever developed for Decree 163 to guide its implementation.

Universal Salt Iodisation and the Elimination of Iodine Deficiency Disorders in Viet Nam

Building Back Better: 2013 onwards

The Vietnamese NIDDC programme, as designed and implemented between 1993 and 2005 was not sustainable. It relied on the iodized salt subsidy programme and iodized salt producers only produced iodized salt because they were provided with free KIO₃. These features and the nature of governance in Viet Nam made up for deficiencies in the legislation, which did not require the iodisation of 'common salt'. The strong monitoring and evaluation system also provided detailed data on the situation that motivated provinces and districts to ensure the availability of iodized salt and encourage its purchase. Nevertheless, in the Southeast and Mekong River Delta where government control was less strong, private salt producers were

more common and the salt subsidy system did not operate, coverage with iodized salt remained lower than the national average. It also appears likely that despite high coverage of iodized salt, the majority of households throughout the country were simultaneously consuming non-iodized salt and non-iodized fish sauce.

In 2005, if the NIDDC programme had been downgraded but the salt iodisation legislation had been strengthened as originally planned (and advocated by UNICEF and others), it is likely that, after a difficult transition period, universal salt iodisation would have been maintained as the salt industry absorbed the cost of iodisation and supplies of non-iodized



salt for human consumption declined. Instead, Viet Nam is now in a position similar to that at the start of the IDD programme in 1994 when coverage with iodized salt was less than 50% and median urinary iodine concentrations were deficient. The only thing that remains of the success of the NIDDC programme is knowledge amongst some salt producers about how to produce quality-iodized salt, public knowledge of its benefits, and the experience of using it. In addition, valuable lessons have been learnt about what not to do and how to do it better.

The dramatic decline in iodized salt coverage and urinary iodine concentrations has caused concern amongst health authorities in Viet Nam. There is now agreement that the NIDDC programme has to be re-formulated and revived. Throughout the world, salt iodisation has proven to be an effective strategy for eliminating IDD. The objective in Viet Nam must therefore be to create an environment in which salt iodisation is effective and sustainable. Recommendations for how the new programme might be designed are discussed below, drawing upon lessons learnt

in Viet Nam and experiences of other countries in the region.

Evidence and analysis to support change:

An interesting observation from the time when the national target programme on IDD control was downgraded to a routine public health programme in Viet Nam, is that there was basically no analysis of why the national target programme had succeeded and what were the elements of the programme that needed to be maintained to sustain the achievements. The decision to make the change appears to have been rapidly taken on the basis of achievement of programme targets and an apparent mis-understanding that IDD had been 'cured'. There was no retrospective analysis or programmatic review and evaluation. In order to avoid a similar mistake, the design of the new programme must be based upon a full understanding of (i) why the programme was successful during the national target programme phase, (ii) why the second phase failed and (iii) what the current situation is. Multi-sectoral consensus is needed on these issues as multi-sectoral



collaboration and cooperation is going to be needed if the new programme is to be successful. A common understanding of what is needed by all involved is needed. Credible and comprehensive information on the current situation will also be necessary in order to advocate, at the highest level, for the necessary changes.

This review may be useful as an analysis of what worked well and what went wrong. In addition, a 2013 national IDD survey is ongoing. The survey will provide regionally representative data on iodized salt and salty condiment coverage and urinary iodine concentration. It is also collecting information on consumption of non-iodized salt and knowledge, attitudes and practices on IDD as in past surveys. Thus the survey will provide updated information on the current situation.

A 'gap' in programme information that has existed throughout the programme has been an incomplete understanding of how the salt industry operates in Viet Nam. Information on who produces salt and where and, in particular who produces non-iodized salt has long been lacking. The opportunity should be taken to

collate information from MARD, the NSC and the MoH on the salt industry, in particular to understand where non-iodized salt is coming from and how to prevent it and how salt for food processing is sourced and used. It would also be useful to understand how the salt subsidy system is operating and what future plans are.

Establishing mandatory, universal salt

iodisation: Global experience is that in order for food fortification programmes to be successful (in terms of having a public health benefit) it is necessary that they are mandatory and universal. Analysis of salt iodisation programmes has found that in one decade, countries with mandatory legislation had a greater increase in household coverage (from 49% to 72%) compared with the increases in countries with voluntary iodisation (40% to 49%).¹⁶ In addition, in the case of iodized salt, all salt for human and animal consumption, including salt for processing, needs to be iodized on a mandatory basis. The only way to achieve this in Viet Nam is through national legislation. A number of factors appear to have made this scenario unattractive at the time Decree No.163 was developed. One appears to be that salt iodisation, as previously operated, was seen as being in conflict with the development of the salt industry and domestic and international trade in salt. This perception was related to the fact that (i) the production of iodized salt was supported and coordinated by the MoH as opposed to MARD, which supported the salt industry in general, (ii) that KIO₃ was provided free to approved producers of iodized salt as opposed to all producers of salt for human consumption, and (iii) the subsidy system which also provided competitive advantages to selected producers. There may also have been a misunderstanding that mandatory salt iodisation would have been in violation of World Trade Organization rules.

A further complication seems to be the way salt has been categorized in Viet Nam; there appears to be no category of 'salt for human

16 Horton S., Mannar, V., Wesley, a. Micronutrient Fortification (Iron and Salt Iodisation) Copenhagen Consensus Best Practice Paper 2008. (<http://www.copenhagenconsensus.com/Default.aspx?ID=1303>, accessed 20 February 2013).

consumption' or 'food grade salt'. Thus Decree 19 differentiated between 'common salt' which appears to be all salt and salt that was iodized. This created a large loophole and made it impossible to ensure that all salt that could be used for human consumption was iodized. Optimally food grade salt would be distinguishable from other salt, such as salt for (non-food) industry, and all food grade salt would be iodized. It has also been argued that people should have the right to choose what type of salt they consume. Such people argue for voluntary fortification of salt accompanied by education campaigns, and the continued availability of non-iodized salt. However, global experience shows that public health campaigns that aim to educate the public to chose healthier products over less healthy ones are seldom successful. Thus, in order to protect public health, it is necessary to iodize all salt for human consumption with very specific exceptions such as organic salt or 'medical salt for special needs' for the very small minority of people who cannot consume iodized salt or have very strong objections to it.

Revised legislation for salt iodisation in Viet Nam should explicitly include salt for food processing, with a clear definition/explanation of this term. This is to address the fact that use of salty condiments, in place of salt, is very common in Viet Nam.¹⁷ If only salt for direct consumption is iodized, it is likely that some segments of the population will not have sufficient iodine intake to prevent iodine deficiencies. Bot canh is already frequently made with iodized salt and a study in Thailand and Laos demonstrated that fish sauce can be made with iodized salt with no negative effects on taste or appearance.¹⁸ In addition, a clause can be included in the legislation that enables the exemption of any processed foods for which the producers can demonstrate a negative impact if it is made with iodized salt. Such a clause is included in the Philippines salt iodisation legislation. A requirement to iodize all salt for food processing will be much easier to monitor and enforce than a requirement for

all or selected processed foods to be iodized directly.

Discussions are already underway on how to develop legislation for mandatory salt iodisation. This legislation should avoid the weaknesses of Decree 19 (and Decree 163) and establish mandatory iodisation of all food grade salt within the routine food control system of Viet Nam such that it is monitored and enforced through routine food control systems and not a separate, stand-alone programme. One way of doing this may be to simply establish a national technical regulation for food grade salt, which includes iodisation. This would replace the current national technical regulation for iodized salt.¹⁹ Another option under discussion is to have a Decree on Food Fortification, under the recently passed Food Safety Law, which mandates the fortification of all food grade salt, wheat flour and other foods deemed important, such as cooking oil. This would follow the example of the Philippines, which has an Act mandating the fortification of rice, wheat flour, cooking oil and sugar, and other foods as designated by the MoH.

A further consideration is whether or not the government will continue to provide free KIO₃ for salt iodisation. Viet Nam is currently the only country in the East Asia and Pacific and South Asia regions²⁰ in which the cost of KIO₃ is borne by the government, with the exception of Afghanistan and the Democratic People's Republic of Korea.²¹ If all food grade salt is required (and enforced) to be iodized, there is no need for the government to cover the cost for the KIO₃ as an 'even playing field' will have been created in which all producers have the same costs for iodisation, which they can either chose to absorb or pass onto the consumer. It will also avoid government funds subsidizing the iodisation of salt exported out of Viet Nam. This is a key consideration that will affect the sustainability of salt iodisation in Viet Nam. MARD or the NSC could facilitate salt producers to access KIO₃ such as by acting as importing

17 National Institute of Nutrition. Investigation of dietary sodium intake and sources in adults, aged 25-64 years. 2010

18 Chanthilath et al. Iodine stability and sensory quality of fermented fish and fish sauce produced with the use of iodated salt. Food and Nutrition Bulletin, 2009.

19 National technical regulation on iodized salt. 2011. QCVN9-1:2011/BYT

20 UNICEF regional categorization

21 UNICEF EAPRO Review of National Legislation for Universal Salt Iodisation: South Asia and East Asia and the Pacific. January 2013

agents for KIO₃, as it is not otherwise for sale in Viet Nam.

In order for optimal legislation to be passed, the support of a variety of ministries will be needed including the Ministry of Justice, Finance and MARD. These apparently were responsible for last minute changes to Decree 163 in 2005. It will therefore be necessary to dialogue and advocate with these ministries in advance of submission of new legislation for mandatory salt iodisation in order to ensure their support.

Programme management and coordination:

It seems unlikely, and potentially counter-productive, that the IDD programme would be reestablished as a national target programme. It should however, not be a stand-alone programme. Ideally it would be part of a general food fortification programme or micronutrient programme or it might be part of a programme to control and prevent non-communicable diseases (NCDs), linked to obesity reduction and salt intake. There are pros and cons of all the options and these should all be considered before a decision is made. If part of an NCD programme, salt iodisation should be coordinated with a campaign to reduce salt and sodium intake, including measures to reduce the salt/sodium content of processed foods, monitoring of both sodium and iodine intake, public education to reduce salt/sodium intake and ensuring that achievements in reducing sodium intake are matched by progressive increases in iodine content of salt and other sodium containing products, as required to maintain good iodine status.

Depending on how the salt iodisation programme is managed, a multi-sectoral committee that has an oversight function over universal salt iodisation and the elimination of IDD (and possibly other responsibilities) is likely to be needed. This committee should give a much more prominent role to MARD, the NSC and the Ministry of Industry and Trade (MoIT) than in the previous National Committee for the NIDDC, to reflect the recognition that salt iodisation will be implemented as a routine aspect of salt production in Viet Nam. While the MoH and the Hospital of Endocrinology should be key members of the committee,

ideally a Ministry other than Health or MARD should chair the committee in order to facilitate inter-ministerial collaboration; the Ministry of Planning and Investment might be appropriate, especially if salt iodisation is implemented as part of a strategy to reduce NCDs.

The responsibility of quality assurance of iodized salt should fall to salt producers themselves (internal monitoring) and the Viet Nam Food Administration (VFA), as the primary government institution responsible for food control (external monitoring). All producers of food grade salt should be monitored by the VFA and they should be monitored on all aspects of quality food production, including the requirements of the national technical requirement for food grade salt, which includes iodine content. Measurement of salt samples for iodine content should be carried out in VFA laboratories at central or provincial level, in line with routine food control procedures. Routine, quality assurance systems for the laboratories should be implemented. MARD, NSC or VFA should support salt producers to implement necessary quality assurance systems in their factory laboratories. Any requirement for salt producer registration/ certification should be applied to all producers of food grade salt, rather than only those that produce iodized salt. The VFA should coordinate with MARD, MoIT and NSC as necessary.

The role of the MoH should be to establish the technical standard for food grade salt and KIO₃ and to monitor the outcomes of the programme i.e. the household coverage of adequately iodized salt and salty condiments and urinary iodine concentrations of target populations, in particular reproductive age and pregnant women. Measurement of these two indicators should be incorporated into appreciate existing national surveys such as national nutrition surveys or NCD/ diabetes surveys. Only information that can guide programme implementation should be collected and all data collected should be reported to all stakeholders and used for identification of problems. It is unlikely that three rounds of surveillance at provincial level needs to be maintained; rather resources should be applied to ensuring that all salt is adequately iodized at production level and



that only iodized salt is used for making salty condiments and other processed food.

The laboratory of the HoE should be established as the national monitoring laboratory for urinary and sodium excretion. It should provide quality assurance for all regional and provincial laboratories carrying out urinary iodine and sodium excretion analysis, although if urinary iodine is only to be measured in periodic national surveys it may not be necessary to maintain the same number of regional and provincial laboratories. Any laboratories that do routinely carry out urinary iodine analyses, and certainly the national reference laboratory in the HoE, should enroll in the US Centers of Disease Control EQUIP quality assurance programme for urinary iodine analysis.²²

If all food grade salt is iodized, such that only iodized salt is available for purchase, there will be no need to maintain the subsidy system for iodized salt. Alternatively, marginalized communities could continue to be given a subsidy for iodized salt, which can then be

use to purchase iodized salt from the market, utilizing strategies such as coupons, to ensure that only specific items can be purchased. As no other type of salt will be available for sale, the current problem of the subsidy being used to purchase other products will no longer exist.

Along the same lines, if all food grade salt is iodized, it will no longer be necessary to have a large budget for IEC on IDD and iodized salt. Nevertheless the central level and all provinces should still be encouraged to increase public understanding of the value of iodized salt for preventing iodine deficiency and to encourage the public not to purchase non-iodized food grade salt if they find it in the market. IEC on iodized salt should be coordinated with education on reducing sodium/salt intake and the role of iodized salt in protecting optimal brain development, rather than causing goitre, should be highlighted.

22 <http://www.cdc.gov/labstandards/equip.html>



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