

## Intensified Iodine Deficiency Control in Indonesia

### Use of Salt Iodine Rapid Test for Program Management

D.Latief<sup>a</sup>, L.Palupi<sup>b</sup>, and E.P.L.M. Schoffelen<sup>c</sup>

<sup>a</sup> Directorate of Community Nutrition, Ministry of Health, Jl. HR. Rasuna Said Blok X5, Kav 4-9, Jakarta 12950, Indonesia.

<sup>b</sup> Central Secretariat Indonesia Intensified Iodine Deficiency Control Project, Ministry of Health, Jl. HR Rasuna Said Blok X5, Kav.4-9, Jakarta 12950, Indonesia.

<sup>c</sup> UNICEF, P.O. Box 8318 JKSMP, Jakarta 12083, Indonesia.

The elimination of Iodine Deficiency by the year 2000 is one of the nutritional goals that has been adopted by the Government of Indonesia. Good progress has been made in the reduction of IDD prevalence even though the effort to achieve the Universal Salt Iodization still have to be encouraged. This paper focuses on Indonesian experiences in the use of salt iodine rapid test for IDD control program management.

#### 1. INTRODUCTION

Iodine Deficiency Disorders (IDD) is a significant problem in many areas of Indonesia. It is a significant and preventable risk factor affecting the quality of human resources. The Government recognized that the consequences of iodine deficiency on the function of the thyroid gland is more critical rather than its effect on its structure. The deficiency of iodine can negatively influence human beings from embryonic stage through adulthood. Its most important effect is increased neonatal and infant mortality and reduced mental ability. As such, it can be an important factor limiting the educational achievement and economic development.

In accordance to the need for accelerating progress towards eliminating Iodine Deficiency Disorders in Indonesia, the Government wishes to intensify efforts to control IDD. Based on the recommended criteria defined by WHO/UNICEF/ICCIDD (1), there are three out of four criteria that have been identified as base line data: a) Thyroid size among school children, b) Urinary iodine, and c) Salt iodization.

The national total goiter rate (TGR) dramatically decreased from 27.7% in 1990 to 9.8% in 1998, but the IDD maps show that 7% of sub-districts are still categorized as severe endemic areas, 5% as moderate endemic areas, and 21% as mild endemic areas. The median values of Urinary Iodine showed that 21.3% of districts in Indonesia were in the category of mild to severe iodine deficient areas (2). The progress in salt iodization showed that the proportion of households consuming effectively iodized salt has improved from 58% to 62% and 65% respectively in 1996, 1997 and 1998 (3). The latest data show that it is close to the percentage of households living in countries with IDD where 68% now have access to iodized salt (4).

Two approaches are used in controlling IDD in Indonesia, a) Universal Salt Iodization which on per capita basis is inexpensive, and b) Iodized oil capsule distribution for vulnerable group in high endemic areas. This paper focuses on Indonesian experiences in the use of the salt iodine rapid test for IDD control program management, by enhancing the salt monitoring system.

## 2. INDONESIA INTENSIFIED IODINE DEFICIENCY CONTROL PROJECT

Committed to the resolution of World Health Assembly in 1990 towards the elimination of Iodine Deficiency Disorders by the year of 2000, Indonesia has been conducting the Intensified Iodine Deficiency Control Project since 1997 with the assistance of the World Bank (5). The objectives of the project are to improve the iodine status of the population and to accelerate in the reduction of the prevalence of iodine deficiency through a) monitoring the iodine status of the community, b) increasing consumption of iodized salt, c) increasing the supply and quality of iodized salt, d) targeted distribution of iodized oil capsules, and e) improving inter-ministerial policy and program coordination for the control of iodine deficiency. This project is implemented by the Ministry of Health, Ministry of Industry and Trade and Ministry of Home Affairs, coordinated by a National IDD Committee which is chaired by National Development Planning Agency. At the provincial and district level, the IDD committees have been established as well and coordinated by the local government.

The main strategy of the project is to increase the supply and consumption of adequately iodized salt throughout the country. Thus, the overall aim is to support activities which maximize the probability that most Indonesians will have access to and use iodized salt. This will involve activities which improve the supply of, and increase the demand for iodized salt, and improve the government role in coordination of policy formulation, monitoring and law enforcement.

An institutional strengthening to improve coordination among the three Ministries in supervising the production, distribution and consumption of iodized salt has been carried out.

## 3. INTEGRATED SALT MONITORING WITH SALT IODINE RAPID TEST

Adequately Iodized salt, though it has great potential cost effectiveness and coverage, three years ago was still only consumed by half of households in Indonesia. To support the salt iodization program, the Government of Indonesia

implement an enhancing monitoring system to ensure that all salt for human consumption is adequately iodized.

The monitoring is now recognized as a key requirement for ensuring the sustainability of IDD control program. These activities are carried out in many points of salt distribution and implemented by agencies at the Ministry of Industry and Trade and the Ministry of Health.

The salt iodine rapid test is used in the National Salt Consumption Survey which is integrated annually in the National Socio-Economic Survey (SUSENAS) as well as the routine external monitoring at every point of the salt distribution chain.

The focus of the routine monitoring activities need to be on action, where the collection of data is undertaken with the objective of confirming that the program is proceeding well, and to take immediate corrective action where problems are identified. For this reason, routine external monitoring at different points of the salt distribution chain are done also by salt iodine rapid spot test with lot quality assurance sampling (LQAS) methods (6).

The salt iodine rapid spot test is a technically simple, cheap and rapid check method for detecting iodine in salt, and can be readily performed outside the laboratory. The test can be classified into qualitative or semi quantitative test, and play an important role in salt monitoring programs (7). They provide valuable information about the quality of iodine content and the availability of iodized salt in a certain area. This system intends to be able to identify rapidly companies which produce adequately and inadequately iodized salt, as well as districts in which salt sold at retail markets contain adequate or inadequate iodine. Thus, the data of salt monitoring can be used in the decision making for IDD control program management.

The elements of the integrated salt monitoring system are: a) routine monitoring at production level, b) routine monitoring at the market level, c) community based monitoring, and d) data management and analysis.

#### 4. USE OF DATA FOR DECISION MAKING

The results from the three consecutive years of SUSENAS Surveys show that although the proportion of households consuming adequately iodized salt improved over the years, the total consumption of adequate and inadequate iodized salt has not improved yet, and around 20% of households remain consuming un-iodized salt (Figure 1).

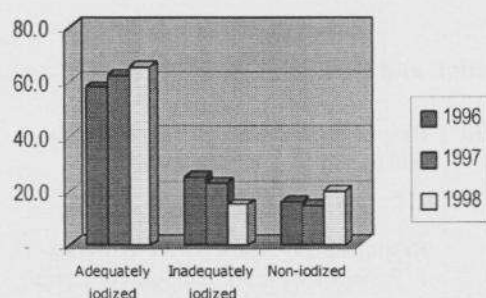


Fig 1. Percentage of households have access to iodized and un-iodized salt 1996-1998

Thus, the main constraint in achieving the Universal Salt Iodization is the infiltration of un-iodized salt to the markets and households from salt-farmers origin. More than this, lack of enforcement of the regulations remains a major difficulty.

To minimize data gathering in salt monitoring in Indonesia, a phased approach is considered where the most intensive and frequent monitoring is taken place in those areas where the need for information is greatest and where the actions to improve the program are most urgent.

The routine external monitoring at production level is especially done in districts where there are salt processors of any capacity, while salt monitoring at the market level and community based monitoring is targeted in those districts with high or low iodized salt coverage based on the annual SUSENAS results. This system is linked to several activities of the Intensified Iodine Deficiency Control Project in a complimentary way, and requires information from other project components, such as IDD status of the

community, as well as provide important inputs which help targeting of other program components, e.g. where to focus Information, Education and Communication (IEC), develop IEC on the basis of specific constraints identified, and ensure the sustainable distribution of adequately iodized salt to all areas of the country.

Figure 2 provides an overview of how the data of national iodized salt coverage by district level (SUSENAS) is used to decide the priority areas for routine intensive and verification salt monitoring at the market level and community based monitoring as well as the activities for Information, Education and Communication.

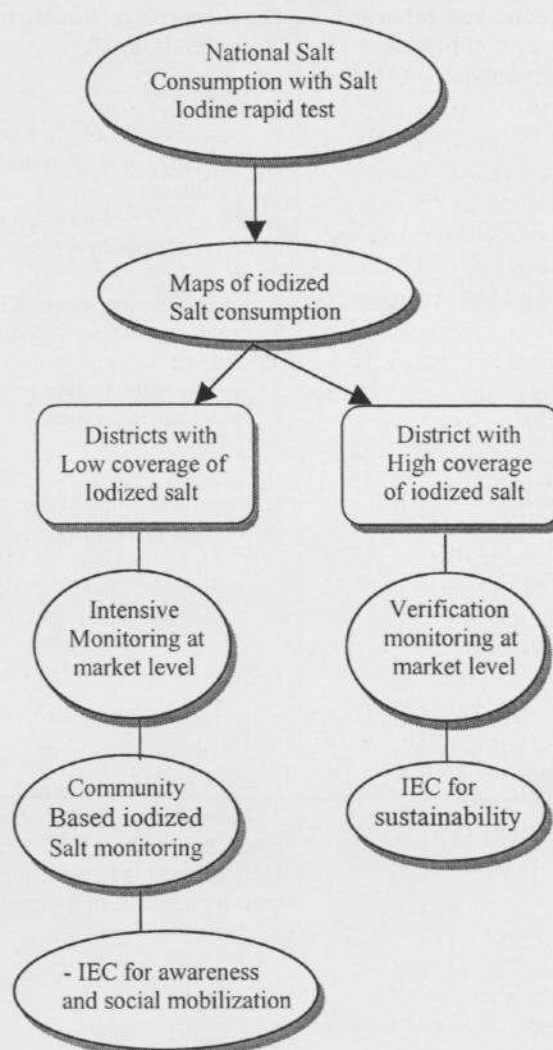


Figure 2. Targeting priority areas based on National Salt Consumption Survey with salt Iodine Rapid Test



The routine external monitoring at the production level is carried out by the Ministry of Industry and Trade who visit each plant on a quarterly basis. For each brand and type of salt, the rapid iodine spot test is used to check the qualitative iodine content of salt by LQAS method, but a small amount of samples is still analyzed by titration to know the average content of iodine for each brand and type of salt.

The routine monitoring at the market level are carried out also on quarterly basis by the Ministry

of Industry and Trade as well as the Directorate of Food and Beverage Control, Ministry of Health. The targeted areas for this kind of monitoring are decided based on the annual SUSENAS results. The Ministry of Industry and Trade is responsible for districts where the coverage of iodized salt is low (<75 % of households consumes adequately iodized salt), and the Directorate of Food and Beverage Control is responsible to verify the districts with high coverage of iodized salt.

**Table 1. Responses and Action from Production and Retail Salt Monitoring**

Iodine content in salt of brands		Possible problem leading to low salt iodine levels in salt	Responses and actions which may be taken to rectify problems
Production	Market		
Good	Bad	<ol style="list-style-type: none"> <li>1. Storage conditions in market</li> <li>2. Frequency of stock turnover and Distribution</li> <li>3. Salt is repacked from large containers or batches</li> </ol>	<b>Responsibility: local MoIT Officials</b> <ol style="list-style-type: none"> <li>1. Provide support to retailers concerning the importance of iodized salt and its proper storage and distribution</li> <li>2. Check packaging procedures</li> </ol>
Bad	Bad	<ol style="list-style-type: none"> <li>1. Inadequate supplies of KIO<sub>3</sub></li> <li>2. Problems with production of iodized salt</li> <li>3. Storage and transport practices</li> <li>4. Inadequate packaging</li> </ol>	<b>Responsibility: MoIT and Producers</b> <ol style="list-style-type: none"> <li>1. Check production procedures and suggest improvements</li> <li>2. Ensure consistent supplies of KIO<sub>3</sub></li> <li>3. Check packaging</li> <li>4. Take punitive action</li> </ol>
N/A	Bad	<ol style="list-style-type: none"> <li>1. Large proportion of raw, non-iodized salt in the market</li> </ol>	<b>Responsibility: Local Government &amp; MoHA</b> <ol style="list-style-type: none"> <li>1. Encourage local salt farmers to participate in cooperatives where iodization of raw salt can take place.</li> <li>2. Establish collaboration between salt farmers and local manufactures of iodized salt where the raw salt may be purchased and rapid reimbursement.</li> </ol>
Bad	Good	<ol style="list-style-type: none"> <li>1. Problem with monitoring</li> <li>2. Difficulties with cross-linking production -market level data</li> <li>3. Different companies using the same brand name in the market.</li> </ol>	<b>Responsibility: MoIT</b> <ol style="list-style-type: none"> <li>1. Check monitoring at production and retail level</li> <li>2. Make sure brands in market are produced by same manufacturers whose production is being monitored.</li> </ol>

Source : J. Gorstein, 1999

The community based salt monitoring is undertaken by school teachers in collaboration with health workers from a representative sample of school children. Data collection is carried out twice a year using LQAS methods. This data is very useful for social mobilization and increasing awareness about the importance of iodized salt at village or sub-district level.

These monitoring data from all points of the salt distribution are utilized to improve the universal salt iodization program through identifying and rectifying constraint to ensure that a greater amount of salt may be iodized with adequate iodine and reach all segment of the population.

Besides the external monitoring, the internal salt monitoring should be encouraged among salt producers. And a small amount of samples for titration is still needed at the production level to reliably quantify the iodine content of salt.

Depending upon the nature of the problem identified, several different responses may be required at different administrative levels and levels of salt distribution (8). Table 1 provides an overview of the types of responses which may be taken from salt monitoring data using salt iodine rapid test.

In supporting an effective monitoring programme to enable take immediate corrective action, an integrated strategy and formulation of standard operations procedure for the implementation of law enforcement is being developed by the National IDD committee. It is expected that in the future the control of IDD in Indonesia by iodization of salt will be succeed if the monitoring data could be used to support the law enforcement.

## 5. CONCLUSION

The Indonesian Programme for the Control of Iodine Deficiency Disorders regularly use the salt iodine rapid test for salt monitoring. The result of the National Salt Consumption Survey (SUSENAS) in terms of iodized salt coverage by district level is use in targeting the priority areas for routine salt monitoring at the market level and community based monitoring, as well as IEC activities.

The salt iodine rapid test is also used in routine salt monitoring at every point of the salt distribution chain. Eventhough the salt iodine rapid test only give a rough guide to iodine levels, the data of external salt monitoring using iodine rapid spot test is very useful to provide valuable information for follow up action. The system intends to be able to identify rapidly companies which produce adequately and inadequately iodized salt, as well as districts in which salt sold in retail markets contain adequate or in adequate iodine.

An institutional strengthening to improve coordination among Ministries is very important to take immediate response and corrective action for the improvement of salt iodization.

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