# NATIONAL IODINE DEFICIENCY DISORDERS CONTROL PROGRAMME

## PUNJAB

### Introduction:

Iodine is an essential micro nutrient. It is required for normal human growth and development. The disorders caused due to deficiency of nutritional iodine in the food/diet are called Iodine Deficiency Disorders (IDDs).

Iodine deficiency during pregnancy leads to decreased availability of iodine to the foetus. This prevents normal development of the brain and body, resulting in a condition known as Neonatal Chemical Hypothyroidism (NCH). Such foetal brain damage is permanent and irreversible and limits intellectual growth in later years.

Iodine Deficiency Disorders are a worldwide major public health problem. As per information available, more than 1.5 billion people all over the world are at risk of IDD.

The Ministry of Health and Family Welfare is the nodal ministry for policy decisions on National Iodine Deficiency Disorders Control Program. The Central Nutrition and Iodine Deficiency Disorders Cell at the Directorate General of Health Service is responsible for the implementation of National Iodine Deficiency Disorders Control Program (NIDDCP) in the country.

The Salt Commissioner's Office under the Ministry of Industry is responsible for licensing, production and distribution of iodated salt to States/UTs. This office is also responsible for monitoring the quality of iodated salt at production level.

### Magnitude of IDD

**A) World:**

- Significant public health problem : 118 countries
- At risk (who live in areas where iodine
- Deficiency is prevalent (total goiter rate s above 5%) : 1572 million
  suffering from IDDs : >666 million
- Some degree of Mental impairment : 43 million

**B) India:**

- At risk: more than 200 million
- Suffering from IDDs: more than 70 million
- Surveys have shown that not even a single State/Union Territory is free from the problem of IDDs.
- 263 out of 324 districts surveyed have prevalence of IDDs more than 10%.

**C) Punjab:** Districtwise prevalence of Iodine Deficiency Disorders as per surveys carried out from time to time is given in the table below:

**Prevalence of Iodine Deficiency Disorders in Punjab**

| S.No. | District | Year of Survey | | | | |
|---|---|---|---|---|---|---|
| | | 1961 | 1962 | 2003 | 2006 | 2007* |
| 1 | Gurdaspur | 40.3% | | | | |
| 2 | Hoshiarpur | 52.3% | | | | 6.07% |
| 3 | Ropar | | 45.8 | 3.93 % | 5.33% | |
| 4 | Bathinda | | | 3.8 % | 2.33% | |
| 5 | Nawanshahar | | | | 0.05% | |
| 6 | Fatehgarh Sahib | | | | 0.2% | |
| 7 | Patiala | | | | | 6.99% |
| 8 | Mohali | | | | | 6.74% |

*Adequately iodized salt (more than 15 ppm) is 92-95% and No sample was found Non-iodized. All districts are mildly endemic (Prevalence of goiter lies between 5 to 19.9%.

**Salt Samples Tested for years 2006-07, 2007-08, 2008-09**
**(State Food Laboratory)**

| Year | Samples | | PFA Limit | |
|---|---|---|---|---|
| | Received | Analysed | > 15ppm | < 15ppm |
| 2006-07 | 179 | 179 | 179 | 0 |
| 2007-08 | 154 | 154 | 154 | 0 |
| 2008-09 | 191 | 191 | 188 | 3 |

**National Family Health Survey (Punjab)**

- **National Family Health Survey-II (1998-99):** 75.5% (>15 ppm) households consume adequately iodized salt, 7.8% households are consuming inadequately iodized salt (<15 ppm) and 16.7% are consuming nil iodine salt.
- **National Family Health Survey-III (2005-2006):** 72.8% households consume adequately iodized salt.

## Survey: Innovative Development Foundation 2007

### Iodine content in Salt Consumed (2007)

- **District Mohali:** All salt samples had more than 15 ppm of Iodine
- **District Hoshiarpur:** 96% salt samples had more than 15 ppm of Iodine
- **District Patiala**: 95% salt samples had more than 15 ppm of Iodine

## Sex wise Prevalence of Goitre among Children (2007)

| District | Male | Female |
|---|---|---|
| Mohali | 4.59% | 8.88% |
| Hoshiarpur | 3.25% | 8.88% |
| Patiala | 4.66% | 9.33% |

## Age wise Prevalence of Goitre among Children (2007)

| District | Age Group/Prevalence | | | |
|---|---|---|---|---|
| | 6-7years | 8-9 years | 10-11 years | 12 years |
| Mohali | 4.16% | 7.69% | 7.91% | 8.33% |
| Hoshiarpur | 3.80% | 6.28% | 7.50% | 8.05% |
| Patiala | 5.00% | 7.56% | 7.91% | 8.61% |

## Urinary Excretion of Iodine among Children (2007)

| District | Urinary Excretion Levels (Micrograms per litre) | | |
|---|---|---|---|
| | Above 100 | 50-99 | Less than 20 |
| Mohali | 34% | 62% | 1% |
| Hoshiarpur | 9.2% | 90.8% | - |
| Patiala | 20% | 80% | - |

**Spectrum of IDDs:** Iodine deficiency results in physical and mental retardation. It affects people of all ages, both sexes and different socioeconomic status. The various disorders associated with iodine deficiency are:

| Spectrum of Iodine Deficiency Disorders | | |
|---|---|---|
| **S.No.** | **Development Stage** | **Iodine Deficiency Disorders** |
| 1 | Foetus | Abortions |
| | | Still births |
| | | Congenital anomalies |
| | | Increased Perinatal Mortality |
| | | Increased Infant Mortality |
| | | Neurological Cretinism: mental deficiency, deaf mutism, spastic diplegia, squint |
| | | Myxoedema Cretinism: dwarfism, mental deficiency |
| | | Psychomotor defects |
| 2 | Neonate | Neonatal Goitre |
| | | Neonatal Hypothyroidism |
| 3 | Child and Adolescent | Goitre |
| | | Juvenile Hypothyroidism |
| | | Impaired mental function |
| | | Retarded physical development |
| 4 | Adult | Goitre with complication |
| | | Hypothyroidism |
| | | Impaired mental function |

**Prevention is Better than Cure**

Iodine Deficiency Disorders with the exception of few are permanent and incurable. However, all these disorders can be easily prevented before they occur. The simplest, most effective and inexpensive method to prevent the broad spectrum of IDDs is to consume iodated salt daily. The average consumption of iodated salt per person per day is about 10 gms.

**Endemicity**

- Prevalence of IDDs more than 10% of the population
- Total Goiter rate more than 5% in the children of age group 6-12 years

**Requirement of Iodine**

- ✓ Daily requirement: 100-150 micrograms [ 50 micrograms for infants(first 12 months of age) 90 micrograms for preschool children (2-6years), 120 micrograms for school children (7-12 years), 150 micrograms for adults ( above 12 years0 , and 200 micrograms for pregnant and lactating mothers)
- ✓ Even less than a small teaspoon for life.
- ✓ The daily requirement of iodine can be met by consuming approximately 10 gms of iodized salt.
- ✓ Iodine is essential for both physical and mental development of the body.
- ✓ It is required for synthesis of thyroid hormones.

**Sources of Iodine**

- Sea foods: sea fish, sea salt, sea weed
- Cod liver oil
- Milk, meat , eggs, vegetables, fruits, cereals,
- Fresh water (1-50 microgram/L)
- Food color Erythrosine is very rich in iodine

- ❖ Daily requirement is normally supplied by well balanced diet and drinking water except in regions where food and water are deficient in iodine.
- ❖ Iodine content of soil determines its presence in both water and locally grown foods.
- ❖ **Requirement of Iodized salt**: Requirement of Iodized salt for entire country is 50 lakh MT. the production is 49.83 lakh MT (2005-06)

**Required Iodine levels in Salt:**

Assumptions:

1. Iodine lost from salt is 20% from production site to household;
2. Another 20% is lost during cooking before consumption.
3. Average salt intake per capita is 10 g/day

**Standards of Iodated Salt:**

Iodated salt means a crystalline solid m white, pale pink of light grey in colour, free from visible contamination such as clay, grit and other extraneous adulterants and impurities. It shall conform to the following standards:

| | |
|---|---|
| Moisture | Not more than 6.oo% by weight of the sample salt |
| Sodium chloride | Not less than 96.0% by weight on dry basis |
| Matter insoluble in water | Not more than 1.0% by weight on dry basis |
| Matter soluble in water other than Sodium Chloride | Not more than 3.0% by weght on dry basis |
| **Iodine Content at** | |
| Manufacturing level | Not less than 30 ppm on dry weight basis |
| Distribution level | Not less than 15 ppm on dry weight basis |

**Packing of Iodated Salt:**

The iodated salt has to be packed only in HDPE or polythene-lined jute bags of 50 kg for bulk quantity and in polythene pouches of 500 gms/1000 gms for retail packing with the following legend on it:

- Name of manufacturer
- Month and year of packing
- Iodine content (when packed)
- Net weight
- Batch number

**Safety of Iodated Salt Consumption:**

As per the WHO report, a safe daily intake of iodine should be in between a minimum of 50 microgram and a maximum of at least 1000 microgram. Since iodine, when taken in a large quantity, is easily excreted through the kidney into urine, the consumption of iodated salt is absolutely safe for each and everyone.

**Indicators for assessing IDD and Criteria for Classifying IDD as a Public Health Problem (WHO)**

| Indicator | No Deficiency | Mild | Moderate | Severe |
|---|---|---|---|---|
| Prevalence of Goitre | - | 5-19.9% | 20-29% | 30% or >30% |
| MedianUIE (microgram per litre | 100 or >100 | 50-99 | 20-49 | < 20 |

**Evolution of National Iodine Deficiency Disorders Control Program**

Government of India launched a 100% centrally sponsored National Goitre Control Program. Brief evolution of the program is as follows

1. 1962: National Goiter Control Program
2. 1984: Policy decision to iodate the entire edible salt in the country
3. 1992: National Iodine Deficiency Disorders Control Program.
4. 2006: Notification regarding ban on sale of non-iodized salt for direct human consumption under the prevention of Food Adulteration Act, 1956 in the entire country issued on 17th May, 2006. There is no ban on the sale of salt for iodization, iron fortification, preservation, industrial, medicinal and animal use.

**Goal:** To reduce the prevalence of Iodine deficiency below 10% in entire country by 2012.

**Objectives**

1. Surveys to assess the magnitude of Iodine deficiency disorders
2. Supply of iodized salt in place of common salt.
3. Resurveys after every 5 years to assess the extent of Iodine deficiency disorders and the impact of iodated salt.
4. Laboratory monitoring of iodized salt and urinary iodine excretion.
5. Health Education & Publicity.

**State IDD Cell:**

IDD cell at the state level has been established in the Directorate of Health and Family Welfare, Punjab. The staff of the cell has been deputed by internal arrangement of staff from the Directorate.

**State IDD Monitoring Laboratory:**

State IDD Monitoring Laboratory has been established at the State Food Laboratory, Sector 11, Chandigarh. Staff has been deputed by internal arrangement from existing staff of the State Food Laboratory. Salt samples are tested for iodine content in this laboratory.

**Program Status**

1. Supply of iodized salt in place of common salt: The findings of survey conducted by Innovative Development Foundation in 2007 in three districts i.e. Mohali, Hoshiarpur and Patiala are as given below:
    - Adequately iodized salt (more than 15 ppm): 92-95%
    - No sample Non-iodized
    - Goitre more in female children
    - Goitre more in children of higher age group i.e. 10 to 12 years
2. Surveys to assess the magnitude of Iodine deficiency disorders: Survey has been undertaken in 2 districts in 2003,4 districts in 2006 and 3 districts in year 2007
3. Laboratory monitoring of iodized salt: - monitoring is done in State Laboratory at Chandigarh
4. Health Education: -To make the people aware of the importance of use of iodized salt, continuing health education of the masses is undertaken through exhibitions, cultural shows, folk media activities, mass rallies, posters, pamphlets, radio/TV spots etc. 21st October is celebrated as Global Iodine Deficiency Disorders Control Program