Ideal iodine intake in women across India
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Introduction

Iodine is an important micronutrient required for optimal mental and physical development in human beings. Iodine Deficiency Disorders (IDD) encompass a range of disabilities and disorders such as goiter, hypothyroidism, cretinism, abortion, still-birth, mental retardation and psycho-motor defects. A majority of these consequences are invisible and irreversible but are fully preventable.

Globally, iodine deficiency is the single-largest cause of preventable brain damage. Children born in areas where the soil is deficient in iodine have 13.5 IQ points less than those in iodine sufficient areas.

Based on the results from a study conducted in Kangra valley (Himachal Pradesh 1), India became one of the first countries to initiate a National Goitre Control Program (NGCP), a public health program in 1962 which was renamed in 1992 as the National Iodine Deficiency Disorders Control Program (NIDDCP). Universal Salt Iodization (USI) was adopted as a strategy to ensure more than 90 per cent of the population has access to adequately iodized salt available at the household level.

India Iodine Survey 2018–19

Nutrition International (NI) along with the All India Institute of Medical Sciences (AIIMS), New Delhi and the Association for the Indian Coalition for the Control of Iodine Deficiency Disorders (ICCIDD) commissioned a first-of-its kind of national level survey titled 'India Iodine Survey 2018-19' across all 29 states and 7 Union Territories (UTs) in India to estimate the household coverage of iodized salt and iodine status, and women of reproductive age (15–49 years) were considered as a proxy for the population.

Key objectives

The primary objective of the survey was to:

- Estimate the coverage of adequately iodized salt at the household level.
- Assess the iodine status among pregnant women, lactating women with an infant less than 6 months, and non-pregnant non-lactating women of reproductive age (15 to 49 years) by measuring their median Urinary Iodine Concentration (UIC);
• Assess knowledge and practices regarding IDD and iodized salt amongst respondents;
• Use the survey findings for strengthening the iodine deficiency disorder control program.

Design
The survey covered a total of 21,406 households in 702 Primary Sampling Units (PSUs) across 29 states and 7 UTs in India. The survey followed a multi-stage cluster sampling with clusters selected using a probability proportional to size (PPS) method.

The fieldwork was undertaken between October, 2018 and March, 2019. Salt samples were collected to estimate the iodine content at the household level through iodimetric titration in the laboratory and urine samples were collected to estimate the status of urinary iodine concentration among pregnant, lactating and non-pregnant non-lactating women in the reproductive age of 15 to 49 years.

Key findings

Household coverage with iodized salt
• At the national level, the household coverage with iodine content equal to or more than 15 Parts Per Million (ppm) was 76.3 per cent. Salt iodized with some iodine, equal to or more than 5 ppm at the household level was 92.4 per cent.
• Among 29 states and 7 UTs, the front runner states with the highest household coverage with iodine content more than and equal to 15 ppm were Jammu & Kashmir (99.8%), Nagaland (99.7%), Manipur (99.5%), Mizoram (99.2%) and Meghalaya (98.4%).

![Household coverage of iodized salt (%) in rural and urban areas.](image1)

![Household coverage of iodized salt (%) by wealth quintile.](image2)

![Median UIC (μg/L) among pregnant, lactating and nonpregnant nonlactating women by place of residence and zones](image3)

![Median UIC (μg/L) among pregnant women across place of residence and across zones in India](image4a)

![Median UIC (μg/L) among lactating women across place of residence and across zones in India](image4b)

![Median UIC (μg/L) among non-pregnant non-lactating women across place of residence and across zones in India](image4c)
The aspirational states and UTs with lowest household coverage with iodine content more than and equal to 15 ppm were Tamil Nadu (61.9%), Andhra Pradesh (63.9%), Rajasthan (65.5%), Odisha (65.8%), Jharkhand (68.8%) and Puducherry (69.9%).

**Urinary Iodine Concentrations in Women**

At the national level, the median urinary iodine concentration (UIC) for pregnant women was 173.4 μg/L, for lactating women was 172.8 μg/L and for non-pregnant non-lactating women it was 178.0 μg/L.

- Across place of residence, the median UIC in urban areas was slightly higher (180.2 μg/L) as compared to rural areas (168.9 μg/L).
- Across place of residence, the median UIC in urban areas for all three respondent groups was slightly higher as compared to rural areas.

**Respondent knowledge and awareness about iodized salt**

- More than half of the respondents (55%) reportedly had heard about iodized salt and 61.4 per cent of them mentioned prevention of goiter as the primary benefit.
- Among 55 per cent of the respondents who had heard about iodized salt, major identifiers reported by them were the word ‘iodized’ (55.3%), brand name (48.5%), information from the shopkeeper (21.1%) and the Smiling Sun logo (20.5%).
- Awareness about iodized salt among urban respondents (62.2%) was higher than rural respondents (50.5%).
- The head of the household (51.8%) was found to be the primary decision maker for purchasing cooking salt.
- About 74.4% of the respondents found electronic mass media (TV and Radio) and 41.1% identified formal interpersonal communication channels as major sources of information on iodized salt.
- The two most important factors in decision making for purchase of cooking salt were found to be price (41%) and brand (40.9%).
Recommendations
Based on this survey findings, the report suggests the following way forward:

- The data shows that 13 states/UTs have achieved USI and so it is recommended that the successful strategies from these states could be contextualized and replicated in the remaining states/UTs to achieve and sustain USI nationally.
- Enforcement and monitoring of iodized salt quality needs to prioritized by government agencies at state level.
- Inclusion of estimation of UIC in national surveys, as an indicator to report the iodine status of the population along with household coverage of adequately iodized salt tested through iodometric titration could be considered by Ministry of Health and Family Welfare.
- The survey also reveals that a larger proportion of refined salt is adequately iodized and hence efforts are needed to promote production and consumption of refined iodized salt.

Conclusions
It is envisaged that this survey will be quite useful for researchers, programmers and policy makers to engage in further discussions to craft a road map to achieve universal salt iodization. The evidence from this survey could be taken into consideration, while treading the path towards reaching the last mile to achieve and sustain USI in the country.

References