

## *Iodine Status among the Local Population*

### *Key Messages*

- ※ Iodine is an essential micronutrient required for the production of thyroid hormones to support growth and development. Persistent low iodine intake will lead to significant health consequences across the age spectrum.
- ※ The Department of Health (DH) conducted the Population Health Survey (PHS) 2020-22 to collect pertinent information on the patterns of health status and health-related issues of the local general population, including iodine nutrition and status. Results showed that the iodine intake was “insufficient” with “mild iodine deficiency status” for persons aged 35 or above, while persons aged 15–34 was classified as having “adequate” iodine intake according to the epidemiological criteria set by the World Health Organization.
- ※ The abovementioned findings of the PHS 2020-22 are consistent with the previous Iodine Survey conducted in 2019. The survey at that time revealed that the iodine status of school-children was considered adequate, while that of pregnant and lactating women was “insufficient” (except pregnant women taking iodine supplements at an average daily intake of equal to or above 150 micrograms per day).
- ※ The Working Group on Prevention of Iodine Deficiency Disorders recommends members of the public to increase iodine intake to maintain adequate iodine nutrition by consuming iodine-rich foods and use iodised salt instead of ordinary table. For pregnant and lactating women, they should take iodine-containing supplements containing at least 150 micrograms per day.
- ※ The DH will continue to monitor the iodine status among local population, enhance public awareness about the importance of healthy eating against iodine deficiency and work in close partnership with community partners to improve population’s iodine nutrition.

# Iodine Status among the Local Population

Iodine is an essential micronutrient required for the production of thyroid hormones to support growth and development. Persistent low iodine intake will lead to significant health consequences across the age spectrum, including goiter (enlarged thyroid), delayed physical development and impaired mental functions. Severe iodine deficiency occurring during foetal growth and neonatal development can cause irreversible brain damage and cretinism (characterised by severe mental retardation and varying degrees of deaf mutism, spasticity, motor dysfunction and short stature)<sup>1</sup>. Depending on age and physiological status, the recommended nutrient intake for iodine ranges from 90 micrograms per day ( $\mu\text{g}/\text{d}$ ) for children 0 to 59 months to 150  $\mu\text{g}/\text{d}$  for adults. During pregnancy and lactating, women’s iodine requirements increase substantially to 250  $\mu\text{g}/\text{d}$  to ensure adequate supply to the fetus and transfer of iodine to breastmilk<sup>1</sup>.

Recognising the importance of preventing iodine deficiency and related disorders, the World Health Assembly adopted in 1991 the goal of eliminating iodine deficiency as a public health problem<sup>1, 2</sup>. While remarkable progress has been made in reducing the incidence and prevalence of iodine deficiency disorders with public

health policies (including health education and awareness campaigns, salt iodisation and iodine supplementation to pregnant women<sup>3, 4</sup>), iodine deficiency remains a significant health issue affecting people in many parts of the world<sup>3, 5</sup>. In 2019, there were about 177 million prevalent cases and 8.11 million incidence cases of iodine deficiency globally<sup>6</sup>. This article aims to report the iodine status among the local population with recommendations on iodine nutrition.

## Iodine Status Evaluation

Iodine status is typically assessed using urinary iodine measurements<sup>4</sup>. To monitor iodine status of a population, the World Health Organization (WHO) recommends using the median urinary iodine concentration from spot urine sample. According to the epidemiological criteria for assessing iodine nutrition set by the WHO (Table 1), an adequate iodine intake is indicated by a median urinary iodine concentration within 100 to 199 micrograms per liter ( $\mu\text{g}/\text{L}$ ) for school-age children aged 6 years or older and adults (excluding pregnant women and lactating women). For pregnant women and lactating women, the corresponding median urinary iodine concentration should be within 150 to 249  $\mu\text{g}/\text{L}$  and 100  $\mu\text{g}/\text{L}$  or above, respectively<sup>7</sup>.

**Table 1: Epidemiological criteria for assessing iodine nutrition based on median urinary iodine concentrations in different target groups<sup>7</sup>**

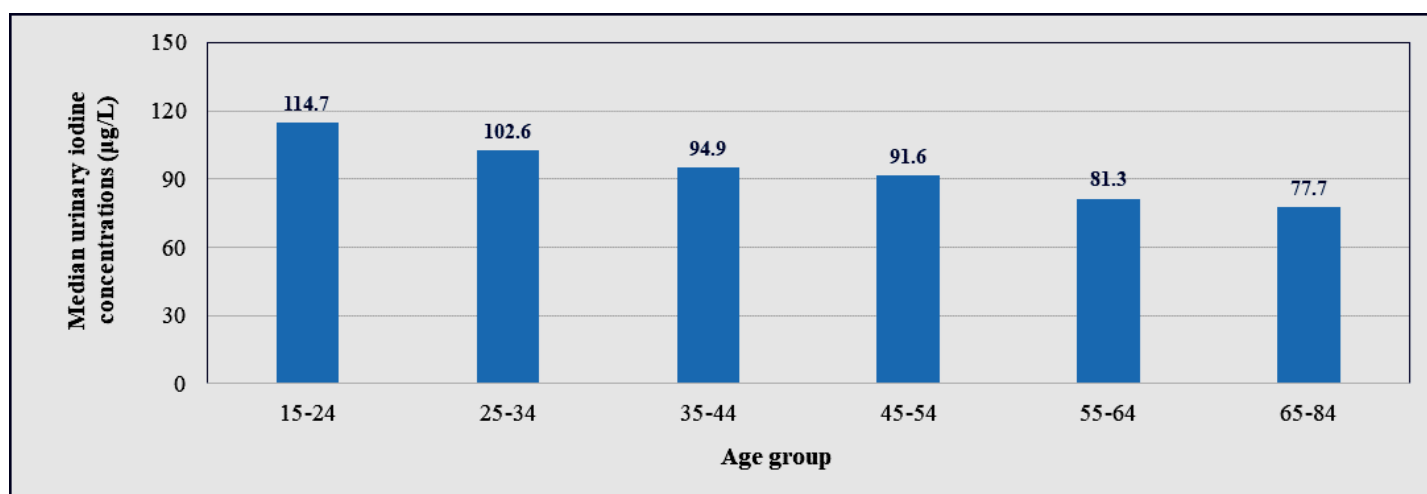
Median urinary iodine ( $\mu\text{g}/\text{L}$ )	Iodine intake	Iodine status
<b>School-aged children aged 6 years or older including adults (excluding pregnant women and lactating women)</b>		
● Less than 20	Insufficient	Severe iodine deficiency
● 20–49	Insufficient	Moderate iodine deficiency
● 50–99	Insufficient	Mild iodine deficiency
● 100–199	Adequate	Adequate iodine nutrition
<b>Pregnant women</b>		
● Less than 150	Insufficient	
● 150–249	Adequate	
<b>Lactating women</b>		
● Less than 100	Insufficient	
● 100 or above	Adequate	

## Iodine Status of the General Population

The Department of Health (DH) conducted the Population Health Survey 2020-22 to collect pertinent information on the patterns of health status and health-related issues of the local general population, including iodine nutrition and status<sup>8</sup>. A total of 16 655 land-based non-institutionalised persons aged 15 or above (excluding foreign domestic helpers and visitors) were enumerated and face-to-face interviewed for information, among others, about their use of iodised salt at home as well as frequency of consumption of iodine-rich food including seaweeds (such as kelp/laver but excluding ready-to-eat seaweed snack) and ready-to-eat seaweed (including pre-packed snacks/nori sheet). The survey also successfully invited 2 066 respondents aged 15–84 to complete a spot urine test for urinary iodine concentrations, which reflected their recent iodine intake.

The survey found that the median urinary iodine concentrations of persons aged 15–84 was 91.3  $\mu\text{g/L}$  (93.7  $\mu\text{g/L}$  for males; 88.1  $\mu\text{g/L}$  for females). Among different age groups, the median urinary iodine concentrations in younger age groups was observed to be higher (Figure 1). The median urinary iodine concentrations of persons aged 15–34 was 107.5  $\mu\text{g/L}$ , while that of persons aged 35–54 and 55–84  $\mu\text{g/L}$  was 92.7  $\mu\text{g/L}$  and 79.8  $\mu\text{g/L}$ , respectively. According to the epidemiological criteria set by the WHO (the cut-off of 100–199  $\mu\text{g/L}$  for median urinary iodine concentration is classified as “adequate” iodine intake), iodine intake was insufficient with “mild iodine deficiency status” for persons aged 35 or above, while persons aged 15–34 was classified as having “adequate” iodine intake<sup>8</sup>.

**Figure 1: Median urinary iodine concentrations among land-based non-institutionalised persons aged 15–84 by age group**



Source: Population Health Survey 2020-22.

The survey also observed that the use of iodised salt was not common among local domestic households. Only 21.0% of persons aged 15–84 reported the use of iodised salt at home. Besides, 8.7% and 6.7% of respondents reported consumption of seaweed and ready-to-eat seaweed respectively at least once per week.

Of note, median urinary iodine concentrations increased as seaweed consumption frequency increased, from 90.4  $\mu\text{g/L}$  among persons who consumed seaweed none/less than once per month to 104.9  $\mu\text{g/L}$  among those reported consumed seaweed once per week or more; and from 87.8  $\mu\text{g/L}$  among persons who consumed ready-to-eat seaweed none/less than once per month to 108.0  $\mu\text{g/L}$  among those reported consuming ready-to-eat seaweed once per week or more<sup>8</sup>.

## Iodine Statuses among Vulnerable Target Groups

To assess the iodine statuses of the three target vulnerable groups, namely school-aged children, pregnant women and lactating women, the DH had also commissioned the Chinese University of Hong Kong to conduct a territory-wide Iodine Survey in 2019<sup>9</sup>. The survey recruited 1 023 school-aged children, 1 513 pregnant women and 482 lactating women from different regions of Hong Kong. While information on consumption of specified iodine-rich food, iodised salt and nutrition supplements, among others, were collected via face-to-face questionnaire interview, spot urine iodine tests were conducted for all participants. In addition, thyroid ultrasonography was performed for school-aged children.

Based on the survey results, the iodine status of school-children was considered “adequate”, while that of pregnant and lactating women was “insufficient” (except pregnant women taking iodine supplements at an average daily intake of equal to or above 150  $\mu\text{g/d}$ )<sup>9</sup>.

**Table 2: Median urinary iodine concentrations and iodine statuses of school-aged children, pregnant women and lactating women**

	Median urinary iodine ( $\mu\text{g/L}$ )	Iodine status
<b>School-aged children aged 6-12</b>	115	Adequate
<b>Pregnant women</b>		
● With iodine supplementation at an average intake of equal to or above 150 $\mu\text{g/d}$	156	Adequate
● With iodine supplementation at an average of intake of less than 150 $\mu\text{g/d}$	132	Insufficient
● Did not consume any supplement or consumed supplement without iodine	97	Insufficient
<b>Lactating women</b>	65	Insufficient

Source: Iodine Survey Report 2021.

## Meeting the Dietary Iodine Requirement and Preventing Iodine Deficiency

The Working Group on Prevention of Iodine Deficiency Disorders was set up by the DH and the Centre for Food Safety of the Food and Environmental Hygiene Department with representatives from the Hospital Authority, the Hong Kong College of Community Medicine, the Hong Kong College of Family Physicians, the Hong Kong College of Obstetricians and Gynaecologists, the Hong Kong College of Paediatricians, and the Hong Kong College of Physicians. The Working Group has reviewed the local situation and the latest scientific evidence, and made the following recommendations:

Members of the public are advised to increase iodine intake to maintain adequate iodine nutrition.

### (1) Consume iodine-rich foods

- ◆ Consume food with more iodine as part of a healthy balanced diet. Seaweed, kelp, seafood, marine fish, eggs, milk, dairy products are food rich in iodine.
- ◆ When choosing iodine-rich snacks, avoid those which are high in salt or fat content.

### (2) Use iodised salt

- ◆ Use iodised salt instead of ordinary table salt, keeping total salt intake below 5 g (1 teaspoon) per day to lower the risk of raised blood pressure.
- ◆ As iodine content in iodised salt may be affected by humidity, heat and sunlight, iodised salt should be stored in a tight and coloured container and kept in a cool dry place.

- ◆ To minimise loss of iodine through the cooking process, in particular from prolonged boiling and pressure cooking, add iodised salt to food as close to the time of serving as possible.
- ◆ Persons with thyroid problems should seek medical advice regarding use of iodised salt.

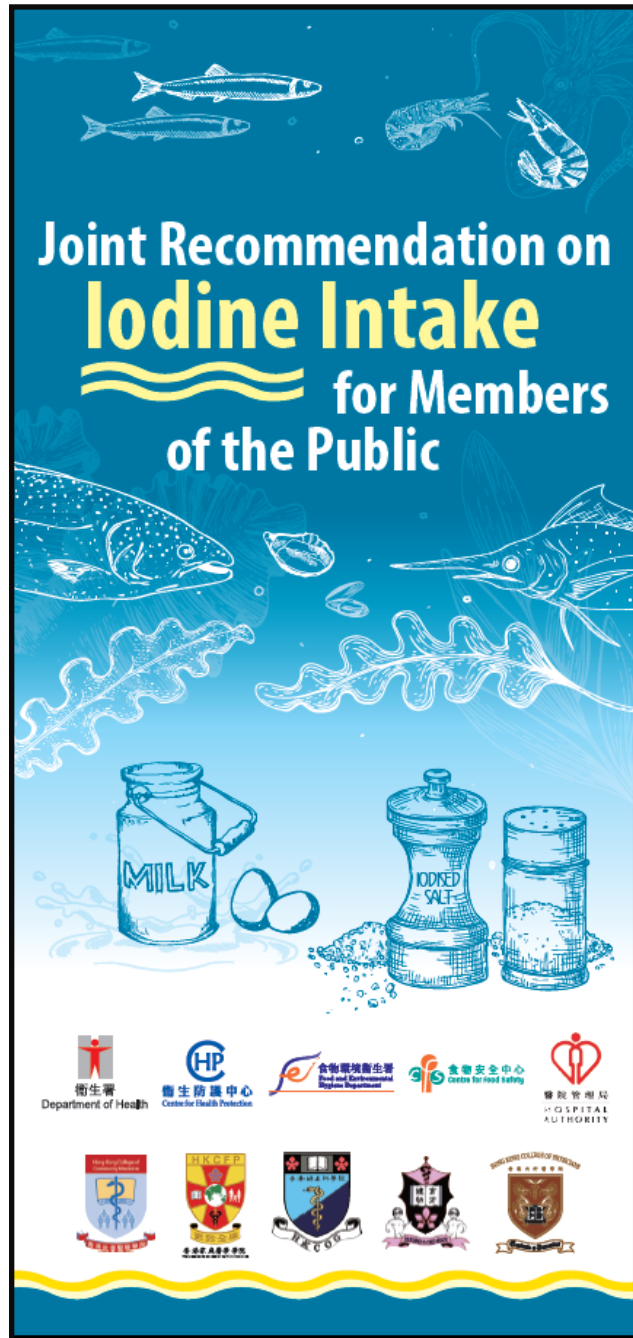
### (3) Additional measures for pregnant and lactating women

- ◆ Take iodine-containing supplements containing at least 150 µg iodine per day.
- ◆ Seek medical advice if in doubt.
- ◆ Persons with existing medical conditions or thyroid problems should consult healthcare professionals and take supplements as instructed.

The DH will continue to monitor the iodine status among local population, enhance public awareness about the importance of healthy eating against iodine deficiency and work in close partnership with community partners to improve population's iodine nutrition.

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For access to the pamphlet, please visit [https://www.chp.gov.hk/files/pdf/joint\\_recommendation\\_on\\_iodine\\_intake\\_for\\_the\\_public\\_pamphlet.pdf](https://www.chp.gov.hk/files/pdf/joint_recommendation_on_iodine_intake_for_the_public_pamphlet.pdf).

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