



Total individual micronutrient intake

Overview

Total individual micronutrient intake is in the class of indicators that measures individual intake of a single nutrient (e.g. vitamin A, thiamin, riboflavin, niacin, vitamin B6, folates, vitamin B12, vitamin C, calcium, iron, zinc). It quantifies the daily intake of individual micronutrients, and can also be paired with further data in order to calculate insufficient micronutrient intake or prevalence of (adequacy or) inadequacy.

Micronutrients are of particular nutritional importance because malnutrition due to micronutrient deficiency continues to be a widespread problem in low-income countries. Micronutrients, especially iron, iodine, vitamin A, and zinc, are essential not just for infants and children to ensure proper growth and development, but also adults for continued work productivity, healthy pregnancies, and overall cognitive and physical health ([Muller & Krawinkel, 2005](#) [1]). Some of the other indicators that measure individual intake include Nutrient Adequacy Ratio (NAR) and [Mean Adequacy Ratio](#) [2] (MAR), [probability of inadequacy of specific micronutrient intake](#) [3], Mean Probability of Adequacy (MPA) across several micronutrients, [total individual macronutrient intake](#) [4], and [total individual energy intake](#) [5]. For more discussion on the comparative uses of these indicators, refer to the 'Uses' section below.

Method of Construction

In order to estimate individual daily intake of micronutrients, data from a [24-hour Dietary Recall](#) [6] method, a [Weighed Food Record](#) [7], or a [Food Frequency Questionnaire](#) [8] (FFQ) are required. Population mean consumption can be estimated with a single survey but the survey must be repeated on at least a subsample of the survey population for two non-consecutive days of intake to estimate 'usual intake'. The number of days of intake per subject that must be collected depends on the micronutrient of interest ([Institute of Medicine \[IOM\], 2000](#) [9]). The final sample should be representative of all days of the week. It is important that enumerators ensure individuals report not just food consumed, but also any supplements taken and if any of the foods were potentially fortified. Using the weight of foods consumed and a Food Composition Table (FCT), the amount of each micronutrient of interest contained in the reported foods is calculated. If information is available in the FCT, phytates and other factors that inhibit the absorption of key nutrients such as iron and zinc should be taken into consideration.

For more information on how this indicator is constructed, see Chapter 2 entitled 'Overview of the WHO Intake Monitoring, Assessment and Planning Program (IMAPP)' of the following World Health Organization (WHO) report ([WHO, 2009](#) [10]). If this indicator will be used to calculate inadequacy or deficiencies, intake can then be compared to the distribution of Estimate Average Requirements (EARs) or Recommended Daily Allowances (RDAs) of specific micronutrients, which depend on the individual's age and sex (for more information, see [Murphy & Poos \[2002\]](#) [11]).

Uses

Individual micronutrient intake can be a useful indicator in assessing the need for, or impact of nutrient-specific interventions including fortification and supplementation, which may be desirable in given locations or with specific population subgroups, such as pregnant and lactating women. Additionally, if micronutrient intake data are available

for all members of a household, this indicator could shed light on the dynamics of intra-household allocation of food. However, this indicator alone cannot be used to assess adequacy of intake, and indicators that incorporate age and sex specific nutrient requirements, such as [MAR](#) [2] or probability of (in)adequate intake, may be more appropriate. Additionally, indicators such as [total intake of macronutrients](#) [4] or [total individual energy intake](#) [5] may need to be used in conjunction with this one to provide a fuller picture of the components of a healthy diet.

Strengths and Weaknesses

One strength of this indicator is that it allows researchers to estimate an individual's intake of specific micronutrients and, in gathering data on individual micronutrient intake, researchers are able to pair findings with individual demographic information, such as religion, age, sex, education, or any other characteristics of interest, assuming the study has been designed for these purposes ([Nayga, 1994](#) [12]). However, this indicator does not speak to the adequacy of the diet as a whole, to dietary patterns, or the ability of individuals to absorb and use the micronutrients.

Data Source

Intake data can be obtained from individual [24-hour Dietary Recall](#) [6] surveys, [Weighed Food Records](#) [7], or [FFQ](#) [8]. The Food and Agriculture Organization and WHO's Global Individual Food consumption data Tool ([FAO/WHO GIFT](#) [13]) is a source for individual-level quantitative dietary data. The FAO/WHO GIFT aims to make publicly available existing quantitative individual food consumption data from countries all over the world. National or regional Food Composition Tables should be used to identify the nutrient contents of the foods and can be found at FAO's International Network of Food Data Systems ([INFOODS](#) [14]) or the International Life Science Institute's (ILSI) World Nutrient Databases for Dietary Studies ([WNDDS](#) [15]).

Links to guidelines

- [WHO, \(2009\). "Report of the WHO meeting on estimating appropriate levels of vitamins and minerals for food fortification programmes"](#) [10]

Links to validation studies

- [Kennedy et al., \(2007\). "Dietary diversity score is a useful indicator of micronutrient intake in non-breast-feeding Filipino children"](#) [16]

Expert review conducted by:

- Dr. Yves Martin-Prével, Director of Research, Institut de Recherche pour le Développement (IRD)

Food Security Dimensions

- [Quality](#) [18]

Data Collection Levels

- [Individual](#) [19]

Data Sources and Methods

- [24-Hour Dietary Recall \(24HR\)](#)
- [Weighed Food Record \(WFR\)](#)
- [Food Frequency Questionnaire \(FFQ\)](#)
- [Food Composition Databases](#)

Requires Food Composition Database

- [Yes](#) [20]

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