

Median Urinary Iodine Concentration in School-Age Children Does Not Consistently Vary by Inflammation or Sociodemographic Factors: Multi-Country Analysis From BRINDA

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Objectives: Iodine is an essential micronutrient that plays a critical role in child growth and development. This study aimed to examine median urinary iodine concentrations (mUIC) by country and key health and sociodemographic factors.

Methods: Nationally representative surveys from Bangladesh (n = 1282), Ecuador (n = 6063), Malawi (n = 758), and the U.S. (n = 3548) were analyzed to estimate mUIC among school-age children (6–12 years old) from the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia (BRINDA) project. WHO classifies mUICs into four categories: insufficient iodine intake, defined as mUIC < 100 µg/L; adequate iodine nutrition categorized as mUIC from 100 to 199 µg/L; above the required intake as mUIC from 200 to 299 µg/L; and excessive intake as mUIC > 300 µg/L. Inflammation was defined by Alpha 1-acid glycoprotein (AGP) of >1 g/L or C-reactive protein (CRP) of >5 mg/L. Underweight was defined by Body Mass

Index (BMI) for age z-score < -2 and overweight was defined as BMI z-score > 2. Complex survey designs were applied to calculate the mUIC for each country. Design-based median tests were used to examine whether mUICs differed by age, sex, weight status, and inflammation status by country.

Results: mUIC was adequate in Bangladesh (138.5 µg/L) and above the required intake in Ecuador (251.0 µg/L), Malawi (265.5 µg/L), and the U.S. (230.0 µg/L). Boys had a significantly higher mUIC than girls in Ecuador (257.0 vs. 237.0 µg/L, P = 0.03), Malawi (302.0 vs. 226.8 µg/L, P = 0.01), and the U.S. (264.0 vs. 210.3 µg/L, P = 0.04). mUIC was not significantly different by age groups (6–9 vs. 10–12 years), weight status, and inflammation status, except in Bangladesh where the group with inflammation had a higher mUIC than the group without (153.0 vs. 130.0 µg/L, P = 0.04).

Conclusions: Although heterogeneity existed in mUICs across different countries, iodine intake was adequate or above requirements in all four countries. Compared to girls, boys had higher mUIC in 3 countries, and the group with inflammation had higher mUIC in 1 country. mUIC did not differ by other socioeconomic or anthropometric factors.

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