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Billions worldwide consume inadequate levels of micronutrients critical to human health

Food isn't just energy, it's nutrition as well. And new research revealed that much of the world isn't getting its vitamins. More than half of the global population consumes inadequate levels of several essential micronutrients, according to a new study by researchers at UC Santa Barbara, Harvard T.H. Chan School of Public Health, and the Global Alliance for Improved Nutrition (GAIN). The study, published in The Lancet Global Health, is the first to describe inadequate consumption of 15 micronutrients critical to human health.

Micronutrient deficiencies are one of the most common forms of malnutrition globally, and each deficiency carries its own consequences, from pregnancy issues, to blindness, to increased susceptibility to diseases. Previous research has estimated the amounts of micronutrients available to, and consumed by, people; this study evaluates whether these intakes meet requirements recommended for human health and looks at the inadequacies specifically facing males and females across their lifespans.

"Our study is a big step forward," said co-lead author Chris Free, a research professor at UCSB. "Not only because it is the first to estimate inadequate micronutrient intakes for 34 age-sex groups in nearly every country, but also because it makes these methods and results easily accessible to researchers and

practitioners.”

The team used data from the Global Dietary Database, the World Bank and dietary recall surveys in 31 countries to compare nutritional requirements with nutritional intake among the populations of 185 countries. (They have made these data, as well as code for analysis, freely available.) They divided populations into males and females belonging to 17 age groups: zero to 80 in five-year spans, as well as an 80+ group. The assessment included 15 vitamins and minerals: calcium, iodine, iron, riboflavin, folate, zinc, magnesium, selenium, thiamin, niacin, and vitamins A, B6, B12, C and E.

The authors found significant intake inadequacies for nearly all of the evaluated micronutrients, excluding fortification as a potential source of additional nutrients. This was especially prevalent for calcium (72% of the global population), iodine (68%), vitamin E (67%) and iron (65%). More than half of the study population consumed inadequate levels of riboflavin, folate, and vitamins C and B6. Intake of niacin was closest to sufficient, with 22% of the global population consuming inadequate levels, followed by thiamin (30%) and selenium (37%).

Estimates for inadequate nutrient intakes were higher in women than men for iodine, vitamin B12, iron and selenium within the same country and age groups. Conversely, more men consumed inadequate levels of calcium, niacin, thiamin, zinc, magnesium, and vitamins A, C and B6 compared to women.

While patterns of micronutrient inadequacy emerged more clearly on the basis of sex, the researchers also observed that males and females ages 10-30 were most prone to low levels of calcium intake, especially in South and East Asia and sub-Saharan Africa. Calcium intake was also low across North America, Europe and Central Asia.The researchers noted that a lack of available data, especially on individual dietary intake worldwide, may have limited their findings.

“These results are alarming,” said Ty Beal, a senior technical specialist at GAIN. “Most people — even more than previously thought, across all regions and countries of all incomes — are not consuming enough of multiple essential micronutrients. These gaps compromise health outcomes and limit human potential on a global scale.”

“The public health challenge facing us is immense, but practitioners and policymakers have the opportunity to identify the most effective dietary interventions and target them to the populations most in need,” added senior author Christopher Golden, an associate professor of nutrition and planetary health at Harvard Chan School.

This release was prepared by Maya Brownstein at the Harvard T.H. Chan School of Public Health.

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