The need for nuance with dietary data

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What people eat, why people make certain food choices, who has choices, how these food choices influence dietary patterns, and how these patterns impact health outcomes are still largely unknown (1). There are various reasons why the nutrition community has been navigating within a dietary black box. Some factors include the limited comprehensiveness, temporal coverage, use of dietary recall, expense, representativeness, disaggregation, comparability, and standardization of collecting individual dietary data (2). Filling these knowledge gaps is critical because the types of suboptimal dietary patterns consumed worldwide now pose significant risk factors for morbidity and mortality (3, 4). Understanding what people consume, the nutritional adequacy and quality of that consumption, and its ramifications on dietary quality and nutrition outcomes is critical to construct evidence-based policy recommendations to improve diets (5).

The study by Passarelli et al. (6), "Estimating national and subnational nutrient intake distributions of global diets," published in this issue of *The American Journal of Clinical Nutrition*, attempts to fill that knowledge gap by analyzing individual dietary intake data from a large set of food consumption surveys of various sources to estimate the intakes of 32 micronutrients and 21 macronutrients, disaggregated by sex and age, across 31 geographically distinct countries around the world. They also examined these data across at least 2 days of recall to get a more holistic picture of dietary variability of what people consume day to day. The authors analyzed these recall data and estimated best-fit parametric distributions of nutrients across country, sex, and age groups. They then compared variance and skewness among types of nutrients to better assess a population's usual nutrient intake distribution and the estimated prevalence of inadequacy.

Their analysis presents some interesting findings. First, a range of vitamins, including vitamins B12, C, A, K, folate, and D, demonstrate high variability, less similarity, and diverging patterns of inadequate intake both geographically and by sex, as did omega-3 fatty acids and minerals such as iron and selenium. Some of these patterns could be assumed to be influenced by the local agro-ecological context of where food is grown or more prominent factors of food system insufficiencies, such as a lack of food availability due to underdeveloped supply chains and/or inadequate economic, social, and physical access to nutritious foods. Second, their findings suggest that women had higher levels of inadequate intake across some nutrients, particularly in low- and middle-income countries of Southeast Asia and sub-Saharan Africa. Third, there was a high prevalence of inadequate intake of nutrients, such as in Bangladesh, Laos, and Ethiopia, where poverty is a major driver of malnutrition.

These distribution data suggest that nuance in understanding the dietary contributions to nutrient intakes is everything. Global modeling and estimate averages of dietary intake can give a generalizable signal on what direction to take when it comes to the design and implementation of policies and programs. However, they are just that: generalizable but maybe less transferable. Models and estimates consist of various surveys and mixed sources of secondary data analysis to make amends for data gaps in which dietary data are either unavailable for all countries or not nationally represented 24-hour dietary recall data (7). Passarelli and colleagues' (6) data show that widely variable and asymmetric nutrient intake distributions justify augmented targeted nutrition interventions that are more geographically precise, people-centered, and situation-oriented. In addition, more attention to disaggregation of geographic and population-specific dietary and nutrient intake data can highlight vulnerabilities and marginalization, allowing for more tailored programs to improve dietary diversity and quality through food system interventions and nutrient-specific programs, such as biofortification, fortification of staple foods, and supplementation for some populations (8).

While fragmented or incomplete dietary data should not stymie governments to make decisions, there is a need to invest significant resources in collecting and analyzing better and more frequent quality dietary intake data (9). As the authors point out, this study was limited because some of the country dietary surveys utilized were outdated—harking back to 20 years—and many countries did not collect dietary data across multiple time points. Thus, while some countries have been collecting dietary surveys regularly, the majority of countries have very old data, unavailable data, or 1-time-only surveys available. Because of this dearth of data, details about what people eat have been primarily based on estimates of national food supply data (what foods or commodities are produced, imported, exported, and wasted in a country) or estimates from other countries, rather than direct measurements of the foods people consume.

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This paper presents a new analysis of dietary consumption data and gives insights into the distribution of nutrient intakes across different populations and places. While their data present nuance, more questions arise as to why there is such variance and asymmetry, and the factors that influence those patterns across gender and geographic dimensions. Furthermore, why vitamin intake distributions were more variable and less similar among regions than macronutrients and minerals is a less understood and interesting future area of research.

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