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Global measure underestimates the severity of food insecurity

Before you can address a problem, you need to understand its scope. That's why the United Nations developed the Integrated Food Security Phase Classification System. Aid organizations rely on analyses from this global partnership, which monitors and classifies the severity of food insecurity to help target assistance where and when it is most needed.

These analyses are multifaceted and complex — often taking place in regions where data is scarce and conditions are deteriorating — and stakeholders tend to assume they overestimate need. However, a **new study** in Nature Food finds the opposite: Global assessments systematically underestimate hunger.

"This matters because these metrics are used to trigger funding for emergency relief," said co-author Kathy Baylis, a professor in UC Santa Barbara's Department of Geography. "It also matters because overall, this process has been accused of exaggerating the number of hungry people."

Accurately identifying hunger crises is crucial to directing international humanitarian responses. In 2023, about 765 million people around the world lacked sufficient food to meet their basic needs. Nearly one-third of those experienced acute food insecurity that put their lives in danger.

Measuring need

The Integrated Food Security Phase Classification (IPC) system was established in 2004 as a consortium of 21 partner organizations, and it is used to allocate more than $6 billion in humanitarian aid annually.

The IPC analyzes the food security situation in about 30 countries across the world that are particularly vulnerable to food insecurity. To determine whether a location is “hungry” or not (i.e., in urgent need of aid), the evaluation committee uses a wide range of data to estimate the number of hungry people in that location and determine whether it's more or less than 20% of the local population. They base their decision on a variety of data, from food prices to weather patterns to dietary quantity and quality. Analysts then gather to evaluate this information — discussing the data and considering local contexts — according to IPC protocol. Based on their analysis, they assign classifications for each subnational zone, ranging from phase 1 (none/minimal) to phase 5 (catastrophe/famine).

Evaluating the accuracy of these assessments is a technical challenge, though. If they are effective, then the humanitarian community can respond to avert the hunger crisis. “In a sense this means that if they're correct and effective, they're always wrong,” said lead author Hope Michelson, a professor in the Department of Agricultural and Consumer Economics at the University of Illinois Urbana-Champaign (UIUC).

Michelson and Baylis conducted their research with Chungmann Kim, a doctoral student at UIUC, and led by Erin Lentz, associate professor of public affairs at the University of Texas at Austin. Lentz and her colleagues had previously researched food insecurity assessments, and in 2021, the IPC approached them to conduct an evaluation of their own system.

Because 20% of people facing hunger is the threshold for determining whether a location is in crisis (phase 3), this is where under- or overcounting is most likely to show up. “So if you see lots and lots of places that have 19% of the population being hungry, and very few showing 20 or 21% hunger, that could suggest that the committees are trying to be conservative,” Baylis said.

Doublechecking the IPC

The team began their evaluation by conducting approximately 20 interviews with different humanitarian agencies and organizations that use the IPC system in their decision-making. The results conclusively revealed that users tend to assume the IPC overstates the severity of crises.

The researchers then looked at the same data the IPC working groups use in order to assess the agency's process and results. They analyzed nearly 10,000 food security assessments covering 917 million individuals across 33 countries between 2017 and 2023. Many people were included in multiple assessments, so the total came out to 2.8 billion person observations.

The authors looked at the distribution of percentages between phase 2 and phase 3 — at that 20% threshold — and found that the IPC was more likely to classify an area as just under this threshold in cases when the data provide conflicting information about the severity of the situation on the ground. They saw clear evidence of "bunching" just below the phase 3 threshold, and this effect occurred for multiple countries with different levels of overall food insecurity.

The team came up with their own estimates based on the available data and compared their results to IPC's analysis. They identified 293.1 million people in phase 3 or higher, compared to IPC's assessments of 226.9 million people. That means 66.2 million people, or one in five, who are in urgent need could go uncounted.

"The food security indicators that are available to the IPC analysis teams don't always agree with each other," Michelson stated. "The working groups will have different information about the same region over the same amount of time. And we found that they tend to take a more conservative approach in their analysis, especially when indicators are contradictory."

"We think that the committees are worried about the accusation that they overestimate the numbers, so, when in doubt, they undercount," Baylis added. For instance, undercounting seems to be worse when the underlying data are noisier, suggesting that committees tend to be more conservative when the uncertainty is

larger.

That said, the IPC process continues to provide a critical measure of global food insecurity, the researchers point out. Working to refine data collection and decision-making can help to improve confidence in the system. While automation should not replace the current process, the authors note that machine learning could improve it by enhancing data collection and modeling.

Different measurements of food security also capture very different aspects of hunger, the authors explained. They're currently working on understanding how those metrics — in isolation or in combination — predict malnutrition, as well as gaining a better account of aid response.

"There already are huge shortfalls in aid for hunger and famine," Baylis said, "and our work shows that the need is even greater than we thought."

Michelson agreed, adding, "understanding that the current figures are likely to underestimate the actual global population of food-insecure people further underscores the scale and the scope of need, and the importance of allocating more resources to alleviating hunger worldwide."

Marianne Stein at the University of Illinois Urbana-Champaign contributed to this story.

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