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Who Are the World's Food Insecure? Identifying the Risk Factors of Food Insecurity Around the World

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Who Are the World's Food Insecure? Identifying the Risk Factors of Food Insecurity Around the World

by Michael D. Smith and Birgit Meade



Highlights:

- The Food Insecurity Experience Scale (FIES) created by the Food and Agriculture Organization of the United Nations provides a common measure of food insecurity that can be used to track and study food insecurity around the world.
- Using the FIES, researchers found that in 2014, 27 percent of people around the world were food insecure; roughly half of the people in low-income countries experienced food insecurity compared with 10 percent in high-income countries.
- Low levels of education, weak social networks, and the inability of a person to count on friends and family in times of need were found to increase the likelihood of experiencing food insecurity.

Food insecurity—the lack of access to sufficient, safe, and nutritious food—exists at some level in every country. Identifying the world's food insecure and the risk factors for food insecurity can help governments and aid organizations target their assistance to those most in need and develop more effective assistance programs.

Until recently, there was not an individual-level measure that could be used to make valid comparisons of food insecurity across countries to help identify common causes and risk factors. Previous research relied on national-level proxy measures of food insecurity that were primarily used for monitoring global food insecurity. These national-level measures were unable to identify the characteristics of the food insecure or to determine where those people lived within a particular country. This changed in 2014 when the United Nations, Food and Agriculture Organization's (FAO) Voices of the Hungry project developed an experiential measure of food insecurity, the Food Insecurity Experience Scale (FIES). The FIES is the first standardized measure of people's direct experiences of food insecurity appropriate for application on a global scale.

The FIES is modeled after the ERS's U.S. Household Food Security Survey Module, which has been tested, validated, and used annually in the United States since 1995. The FIES consists of eight questions that capture experiences ranging in severity from worrying about running out of food to actually going without eating for a whole day—in both cases, because of a lack of funds or other resources. The questions are posed to a sample of individuals across 150 countries through Gallup's annual World Poll.

Recent research using the FIES found that—although some food insecurity risk factors (low levels of education and limited social networks, for instance) were the same in many countries—there were also differences across regions and levels of economic development. These findings highlight how country-specific data can inform policies to enhance economic development and reduce food insecurity.

The Evolution of Measuring Food Insecurity

U.S. ethnographic research in the early 1990s identified the stages that households experience when living with food insecurity. Household food insecurity is initially characterized by worry about having enough food; followed by dietary changes to make available food last longer; and finally, a decrease in food consumption—first in adults, then by any children in the household. Research has shown that these stages are consistent in both developed and developing countries and across languages and cultures.

Measures of food insecurity generated by experiential data collected through household or individual surveys offer greater precision than measures based on national per capita food supplies, as experiential data can capture people's direct access to food. FAO's measure of prevalence of undernourishment defines undernourishment as the proportion of the population whose dietary energy consumption is less than a predetermined threshold. The FAO measure acts as a national-level proxy for food insecurity but requires strong assumptions about the distribution of food within a country due to the lack of reliable food consumption survey data. ERS's International Food Security

Assessment uses a demand-oriented framework that adjusts for income disparities to estimate food insecurity at a national level (see box, “ERS’s International Food Security Assessment”).

As a complement to these two country-level measures, experiential food insecurity measures offer insights into the determinants of food insecurity at the individual level, making it possible to identify the characteristics and geographic concentration of the food insecure.

FAO Standardizes the FIES To Allow Cross-Country Comparisons

Prior research identifying predictors of experiential food insecurity in developing countries relied heavily on the collection of primary data, with small samples focused on a specific locality, often without a robust way to measure food insecurity. FAO created the FIES to gather consistent and comprehensive information on the prevalence and severity of global food insecurity and to provide countries with a tool to monitor their national food security. FAO contracted Gallup, Inc., in 2014 to collect data in most countries around the world.

The Gallup World Poll gathers information on an individual’s labor force participation, income, education, opinions, experiences, future aspirations, demographic characteristics, and country- and-region identifiers. In most countries, the Gallup World Poll interviews 1,000 individuals and is nationally representative. The number of individuals interviewed is higher for countries with larger populations. For example, in 2014, 3,000 and 5,000 individuals were interviewed in India and China, respectively. Telephone interviews are conducted for medium- and high-income countries with telephone coverage of at least 80 percent. Face-to-face interviews are administered in most developing countries.

The FIES survey consists of eight questions designed to assess the adequacy of an individual’s access to food. The questions focus on respondents’ behaviors and experiences when they have encountered difficulties in meeting their basic food needs over the previous 12 months. Typical of other food insecurity surveys, the FIES questions are asked in order of severity. Each question in the FIES specifies that the food-insecure condition stems from a lack of money or other resources to obtain adequate food.

Survey Questions: FAO Food Insecurity Experience Scale (FIES)

Q1. You were worried you would run out of food because of a lack of money or other resources?

Q2. You were unable to eat healthy and nutritious food because of a lack of money or other resources?

Q3. You ate only a few kinds of foods because of a lack of money or other resources?

Q4. You had to skip a meal because there was not enough money or other resources to get food?

Q5. You ate less than you thought you should because of a lack of money or other resources?

Q6. Your household ran out of food because of a lack of money or other resources?

Q7. You were hungry but did not eat because there was not enough money or other resources for

food?

Q8. You went without eating for a whole day because of a lack of money or other resources?

Source: USDA, Economic Research Service using United Nations, Food and Agriculture Organization, Voices of the Hungry project.

The severity of the respondent's food insecurity is based on the conditions and behaviors reported in response to the survey. An individual's food security status can be determined by summing the affirmed responses. This classification method, however, does not allow for cross-country comparisons, because the same number of affirmed responses would not necessarily correspond to the same level of severity in different countries. Differences across countries in languages, livelihood arrangements, and food-related cultural norms and expectations may affect the way in which the FIES questions are understood by the respondent, and, in turn, may affect their responses.

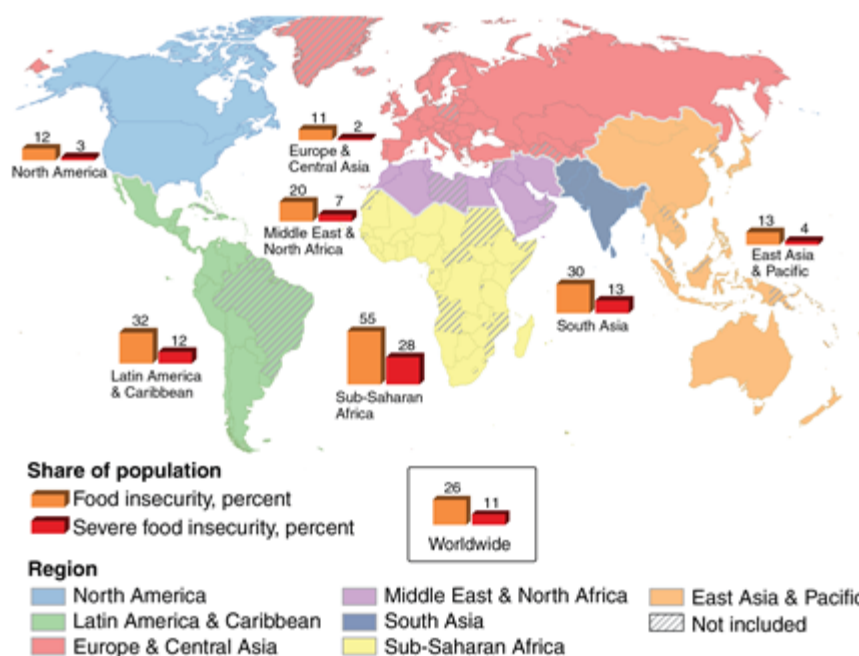
To ensure the measured severity of food insecurity is comparable across countries, FAO equates the food-insecurity scales for each country to the FIES Global Standard Scale. The FAO equating procedure maintains cross-country comparability by creating two standard food-insecurity thresholds—moderate food insecurity and severe food insecurity. The thresholds are adjusted to place the country's scale on the same metric as the global standard.

Individuals are classified as experiencing mild food insecurity if they report a raw score (i.e., number of affirmed responses after the equating procedure) of at least 1 but less than the country-specific threshold for moderate food insecurity (typically, a raw score of 3 or 4). Individuals are classified as experiencing moderate food insecurity if their reported raw score is greater than the FIES threshold for moderate food insecurity but less than the country-specific threshold for severe food insecurity (typically, a raw score of 7). Individuals are assigned a status of severe food insecurity if they report a raw score greater than or equal to the threshold for severe food insecurity.

Global Food Insecurity in 2017 Was Highest in Sub-Saharan Africa

Data from the 2017 FIES show significant variation across global regions and economic development in the prevalence of food insecurity and severe food insecurity. Food insecurity represents the sum of the share of people facing either moderate or severe food insecurity. Severe food insecurity captures individuals experiencing the most extreme range of food insecurity per the FIES and is commonly associated with individuals reporting experiences related to hunger. In 2017, Sub-Saharan Africa had the highest prevalence of food insecurity (55 percent) and severe food insecurity (28 percent), followed by Latin America and the Caribbean (32 percent food insecure and 12 percent severely food insecure), and South Asia (30 percent and 13 percent). Food insecurity and severe food insecurity were lowest in North America and Eastern Europe and Central Asia.

Sub-Saharan Africa has the highest rates of food insecurity and severe food insecurity



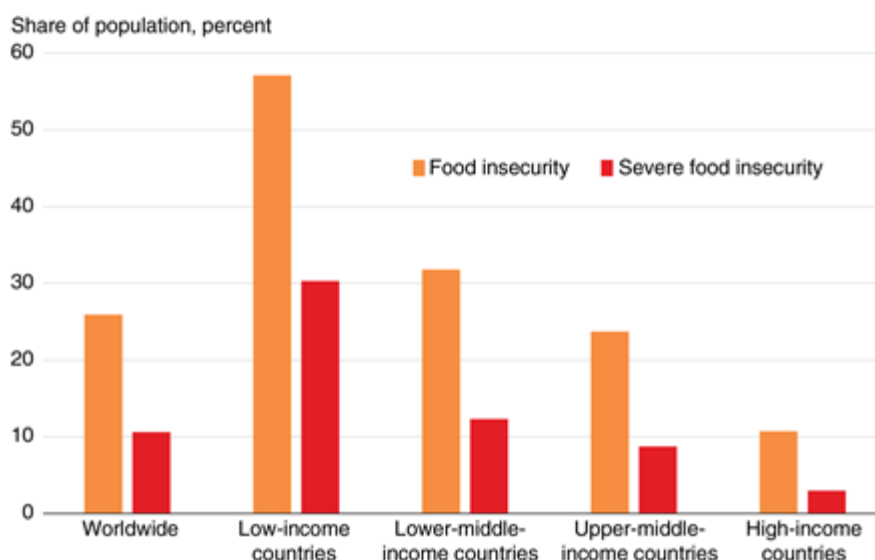
Source: USDA, Economic Research Service using data from the 2017 Gallup World Poll.

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As expected, food insecurity was highest among low-income countries (58 percent) and lowest in high-income countries (11 percent), as defined by the classification of economic development used by the World Bank in 2015. According to this classification, low-income countries have an annual Gross National Income (GNI) per capita of \$1,045 or less, and high-income countries have an annual GNI per capita above \$12,736.

In 2017, close to 60 percent of people in low-income countries were food insecure



Note: In the classification scheme used by the World Bank in 2015, low-income countries have annual Gross National Income (GNI) per capita of \$1,045 or less; lower-middle-income countries have annual GNI per capita between \$1,045 and \$4,125; upper-middle-income countries have annual GNI per capita between \$4,125 and \$12,736; and high-income have annual GNI per capita above \$12,736.
 Source: USDA, Economic Research Service using data from 2017 Gallup World Poll.

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Identifying Top Risks for Global Food Insecurity

Previous research has shown that poverty has the largest influence on whether an individual has adequate access to food. Early research emphasized the role played by economic growth in alleviating food insecurity. However, as discussed in the 2012 edition of FAO's *State of Food Insecurity in the World*, national economic growth is necessary but not sufficient for improving food security. Other factors, such as high food prices, income inequality, and the unequal distribution of food within countries and households, also affect food insecurity rates.

ERS researchers were the first to use the 2014 FIES measure to identify and examine the common determinants of food insecurity in 134 countries. Using a series of regression models that adjust for both individual- and country-level characteristics, they found that five characteristics are most strongly associated with the likelihood of experiencing food insecurity: low levels of education, weak social networks, limited social capital, low household income, and being unemployed. Social networks refers to the respondent's ability to make new friends. Social capital refers to the ability to count on friends and family in times of need.

The ERS researchers uncovered significant heterogeneity in the determinants of food insecurity across countries with different levels of economic development. The associations between food insecurity and gender, the number of adults in the household, living in a rural area, and Gross

Domestic Product (GDP) per capita were all found to vary by development ranking. For example, living in a rural area puts an individual at a greater risk of food insecurity (than living in an urban area) in low- and middle-income countries such as Rwanda and Honduras but is associated with a lower risk of food insecurity in a high-income country like France. Women are more likely to experience food insecurity than men in middle-income countries, but gender is statistically insignificant in low- and high-income countries. An increase in GDP per capita is associated with a decrease in the likelihood of experiencing food insecurity in low- and high-income countries but is statistically insignificant in middle-income countries.

A Detailed Look at Food Insecurity in the Latin America and the Caribbean

A second study using 2014 FIES data provides a more detailed look at food insecurity in Latin America and the Caribbean. Researchers from ERS, the World Bank, and the International Fund for Agricultural Development used the FIES data in combination with a broader set of Gallup World Poll data to analyze the prevalence and determinants of food insecurity in this part of the world. FIES data reveal significant regional variation in the prevalence of food insecurity. For example, the Caribbean region experienced more severe food insecurity (22 percent) than Central America (9 percent), the Andean States (9 percent), and the Southern Cone (4 percent).

In Latin America and the Caribbean, food insecurity is highest in the Caribbean region



Note: Average shares calculated using sample-weighted, individual-level data.
Source: USDA, Economic Research Service using data from the 2014 Gallup World Poll.

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This study examined additional characteristics that may be associated with food insecurity (e.g., education access, immigrant status, degree of religiosity, presence of the internet and/or cell phone in the respondent's home, and satisfaction with the local public transportation system). The top three characteristics associated with higher likelihoods of experiencing food insecurity in Latin America and the Caribbean were low levels of education, limited social capital, and living in a country with low GDP per capita. For example, adults with only elementary education were 15.9 percentage points more likely to experience food insecurity compared to those with a college degree. Educated individuals often possess more assets and have access to opportunities for nonagricultural employment, reducing dependence on more volatile agricultural sources of income.

Individuals with high levels of social capital had a 13.0-percentage-point lower probability of experiencing food insecurity. Social networks and social capital can provide the food insecure with private assistance in times of need that may help decrease the severity of food insecurity episodes. In developing countries, however, this private assistance is often too small and uneven in coverage to offer adequate assistance.

Looking Ahead: Combating Food Insecurity

In most countries, the prevalence of food insecurity, as measured by FAO's prevalence of undernourishment, has declined over the last several decades. Recent analysis by the FAO, however, has shown that global food insecurity rose in 2016 and 2017. In 2017, the number of undernourished people is estimated to have increased to 821 million—about 1 out of every 9 people on the planet. The second United Nations Sustainable Development Goal aims to “end hunger, achieve food security and improved nutrition” for all people by 2030. Tracking progress toward this goal will require both national and individual-level indicators, such as the FIES.

Effective policy interventions to address food insecurity require understanding questions of the whos, wheres, and whys of the food insecure. Experiential food-insecurity measures such as the FIES are crucial for answering these questions. Such experiential measures allow for cross-country comparisons of the severity of food insecurity and insights into the characteristics and geographic concentration of the food insecure.

ERS's International Food Security Assessment

The model used in ERS's International Food Security Assessment projects food demand and food gaps in 76 low- and middle-income countries for the current year and 10 years in the future. Each country's projected level of food demand is based on its projected food prices and income levels and reflects how much food people are projected to be able to afford. The model goes beyond measuring the amount of food in a country; it measures people's ability to purchase food.

Food demand is projected for four food groups covering 100 percent of food consumption: the

major grain consumed in each country (determined by caloric share), other grains, root and tuber crops, and all other food. Food-insecure countries tend to have diets characterized by large shares of grains and roots and tubers, which are typically the most affordable food groups.

The food security of a country is evaluated based on the gap between projected domestic food demand and a caloric target of 2,100 calories per person per day—the average calorie level necessary to sustain life at a moderate level of activity. ERS provides three food-security measures for each of the 76 countries: the number of food-insecure people (those projected to be consuming less than 2,100 calories per day); the share of the population that is food insecure; and the food gap, which is the amount of additional food needed to allow all people consuming below the caloric target to reach 2,100 calories per day. The food-security measures allow researchers to compare the state of food security across countries and to quantify unequal food consumption within a country.


This article is drawn from...

“Who Are the World’s Food Insecure? New Evidence from the Food and Agriculture Organization’s Food Insecurity Experience Scale”, by Michael D. Smith, Matthew Rabbitt, and Alisha Coleman-Jensen, *World Development*, May 2017, Vol. 93, pp. 402–412, doi: 10.1016/j.worlddev.2017.01.006

"Assessing Food Insecurity in Latin America and the Caribbean Using FAO's Food Insecurity Experience Scale", by Michael D. Smith, Woubet Kassa, and Paul Winters, *Food Policy*, August 2017, Vol. 71, pp. 48–61, doi: 10.1016/j.foodpol.2017.07.005

“Food Security Measurement in a Global Context: The Food Insecurity Experience Scale”, by C. Cafiero, S. Viviani, and M. Nord, *Measurement*, February 2018, Vol. 116, pp. 146–152, doi: 10.1016/j.measurement.2017.10.065

International Food Security Assessment, 2018-28, by Karen Thome, Birgit Meade, Kamron Daugherty, and Cheryl Christensen, ERS, June 2018

The State of Food Security and Nutrition in the World 2018. Building Climate Resilience for Food Security and Nutrition , U.N. Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), United Nations Children’s Fund (UNICEF), World Food Program (WFP) and World Health Organization (WHO), Rome, 2018

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