A woman measures a drought-resistant pearl millet plant in a test plot at a farmer field school in Tsholotso District, Zimbabwe, where women implement new farming methods to survive drought and also to prosper in better times.
The Concept of the Global Hunger Index

The Global Hunger Index (GHI) is a tool designed to comprehensively measure and track hunger at the global, regional, and country levels. The International Food Policy Research Institute (IFPRI) calculates GHI scores each year to assess progress, or the lack thereof, in combating hunger. The GHI is designed to raise awareness and understanding of the struggle against hunger. By calling attention to the issue, we hope that this report will help to increase the commitment and resources dedicated to ending hunger worldwide.

All 17 Sustainable Development Goals (SDGs)—including Goal 2, ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture—should be achieved by 2030. Other global initiatives, like Compact2025, have set the goal of ending hunger worldwide by 2025. Yet this cannot be achieved without increased effort and mobilization of resources. We believe there is truth to the adage that “what gets measured gets done”; thus, we intend to consistently and systematically measure global hunger to help ensure that it will be eradicated quickly and once and for all.

Because hunger is a complex problem, a variety of terms are used to describe the different forms it takes (Box 1.1). To capture the multidimensional nature of hunger, GHI scores are based on the following four indicators:

1. **Undernourishment**: the proportion of undernourished people as a percentage of the population (reflecting the share of the population with insufficient caloric intake);

2. **Child Wasting**: the proportion of children under the age of five who are wasted (that is, have low weight for their height, reflecting acute undernutrition);

3. **Child Stunting**: the proportion of children under the age of five who are stunted (that is, have low height for their age, reflecting chronic undernutrition); and

4. **Child Mortality**: the mortality rate of children under the age of five (partially reflecting the fatal synergy of inadequate nutrition and unhealthy environments).

There are several advantages to measuring hunger using this combination of factors (Figure 1.1). This method reflects the nutrition situation not only of the population as a whole, but also of children—a particularly vulnerable subset of the population for whom a lack of dietary energy, protein, or micronutrients (essential vitamins and minerals) leads to a high risk of illness, poor physical and cognitive development, or death. The inclusion of both child wasting and child stunting allows the GHI to reflect both acute and chronic undernutrition. Also, combining multiple, independently measured indicators in the index minimizes the effects of random measurement errors.

GHI scores are calculated using the process described in Box 1.2. The current formula was introduced in 2015 and is a revision of the original formula that was used to calculate GHI scores between 2006 and 2014. The primary differences are that the indicator values are

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**Box 1.1 Concepts of Hunger**

**Hunger** is usually understood to refer to the distress associated with lack of food. The Food and Agriculture Organization of the United Nations (FAO) defines food deprivation, or undernourishment, as the consumption of fewer than about 1,800 kilocalories a day—the minimum that most people require to live a healthy and productive life.*

**Undernourishment** goes beyond calories and signifies deficiencies in any or all of the following: energy, protein, or essential vitamins and minerals. Undernourishment is the result of inadequate intake of food in terms of either quantity or quality, poor utilization of nutrients due to infections or other illnesses, or a combination of these factors. These in turn are caused by a range of factors including household food insecurity; inadequate maternal health or childcare practices; or inadequate access to health services, safe water, and sanitation.

**Malnutrition** refers more broadly to both undernutrition (problems of deficiencies) and overnutrition (problems of unbalanced diets, such as consuming too many calories in relation to requirements with or without low intake of micronutrient-rich foods).

In this report, “hunger” refers to the index based on the four component indicators. Taken together, the component indicators reflect deficiencies in calories as well as in micronutrients. Thus, the GHI reflects both aspects of hunger.

Source: Authors.

*FAO considers the composition of a population by age and sex to calculate its average minimum energy requirement for an individual engaged in low physical activity. This requirement varies by country—from about 1,650 to more than 1,900 kilocalories per person per day for developing countries in 2014–2016 (FAO 2016c). Each country’s average minimum energy requirement for low physical activity is used to estimate undernourishment (FAO, IFAD, and WFP 2015).

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* For background information on the GHI concept, see Wiesmann (2006a).

According to recent estimates, undernourishment is responsible for 45 percent of deaths among children younger than five years old (Black et al. 2013).
now standardized, and child underweight has been replaced by child stunting and child wasting (Wiesmann et al. 2015).

The 2016 GHI has been calculated for 118 countries for which data on all four component indicators are available and where measuring hunger is considered most relevant. GHI scores are not calculated for some higher-income countries where the prevalence of hunger is very low. However, even for some high-income countries, hunger is a pressing concern among a portion of the population. Unfortunately, for most high-income countries, nationally representative data are not regularly collected on the prevalence of undernourishment, child stunting, and child wasting. While data on child mortality are usually available for these countries, child mortality does not necessarily reflect undernutrition in the developed world to the same extent as in the developing world. For these reasons, GHI scores are not calculated for most high-income countries of the world.

The GHI is only as current as the data for the four component indicators. This year’s GHI reflects the most recent country-level data between 2011 and 2016. The 2016 GHI scores therefore reflect hunger levels during this period rather than capturing the conditions solely for 2016.

For some countries, such as Burundi, the Comoros, the Democratic Republic of Congo, Eritrea, Papua New Guinea, South Sudan, Sudan, and Syria, GHI scores could not be calculated because of lack of data on undernourishment. However, all available component indicator data for these countries are listed in Appendix C. In Box 2.1, we have identified the countries with missing data where we believe the hunger situations are cause for significant concern.

GHI scores are based on source data that are continuously revised by the United Nations (UN) agencies that compile them, and each year’s GHI report reflects these revisions. While these revisions result in improvements in the data, they also mean that the GHI scores from different years’ reports are not directly comparable with one another. This year’s report contains GHI scores for 2016 and three reference periods—1992, 2000, and 2008—all of which have been calculated with revised data. To track the progress of a country or region over time, the 1992, 2000, 2008, and 2016 scores within this report can be compared.

For South Sudan, which became independent in 2011, and present-day Sudan, separate undernourishment estimates are not yet available from FAO (FAO 2016c).
The 1992, 2000, 2008, and 2016 GHI scores presented in this year’s report reflect the latest revised data for the four component indicators of the GHI. Where original source data were not available, the estimates for the GHI component indicators were based on the most recent data available. (Appendix B provides more detailed background information on the data sources for the 1992, 2000, 2008, and 2016 GHI scores.) The four component indicators used to calculate the GHI scores in this report draw upon data from the following sources:

UNDERNOURISHMENT: Data from the Food and Agriculture Organization of the United Nations (FAO) were used for the 1992, 2000, 2008, and 2016 GHI scores. Undernourishment data and projections for the 2016 GHI are for 2014–2016 (FAO 2016c; authors’ estimates).

CHILD WASTING AND CHILD STUNTING: The child undernutrition indicators of the GHI—child wasting and child stunting—include data from the joint database of UNICEF, the World Health Organization (WHO), and the World Bank, and additional data from WHO’s continuously updated Global Database on Child Growth and Malnutrition, the most recent Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS) reports, and statistical tables from UNICEF. For the 2016 GHI, data on child wasting and child stunting are from the latest year for which data are available in the period 2011–2015 (UNICEF/WHO/World Bank 2016; WHO 2016; UNICEF 2016a; UNICEF 2013; UNICEF 2009; MEASURE DHS 2016; authors’ estimates).

CHILD MORTALITY: Updated data from the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) were used for the 1992, 2000, 2008, and 2016 GHI scores. For the 2016 GHI, data on child mortality are from 2015 (UN IGME 2015).

The GHI incorporates the most up-to-date data that are available. Nevertheless, time lags and data gaps persist in reporting vital statistics on hunger and undernutrition. Despite the demand for these data and the existence of advanced technology to collect and assess data almost instantaneously, more reliable and extensive country data are still urgently needed. Improvements in collecting high-quality data on hunger and undernutrition will allow for a more complete and current assessment of the state of global hunger, a better understanding of the relationship between hunger and nutrition initiatives and their effects, and more effective coordination among efforts to end global hunger and malnutrition in all its forms.