Children queuing for porridge at a primary school in Blantyre, Malawi. The right nutrition during the first 1,000 days of a child’s life will improve her or his physical and cognitive development and ability to learn in the future.
The Global Hunger Index (GHI) is a tool designed to comprehensively measure and track hunger at the global, regional, and national levels. The International Food Policy Research Institute (IFPRI) calculates GHI scores each year to assess progress and setbacks in combating hunger. The GHI is designed to raise awareness and understanding of the struggle against hunger, provide a means to compare the levels of hunger between countries and regions, and call attention to the areas of the world in greatest need of additional resources to eliminate hunger.

To capture the multidimensional nature of hunger, GHI scores are based on four indicators:

1. **UNDEÑORishment**: the share of the population that is undernourished (that is, whose caloric intake is insufficient);

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

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

4. **CHILD MORTALITY**: the mortality rate of children under the age of five (in part, a reflection of the fatal mix of inadequate nutrition and unhealthy environments).²

There are several advantages to measuring hunger using this combination of factors (Figure 1.1). The indicators included in the GHI formula reflect caloric deficiencies as well as poor nutrition. By including indicators specific to children, the index captures 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, and death. The inclusion of both child wasting and child stunting allows the GHI to capture both acute and chronic undernutrition. By combining multiple indicators, the index minimizes the effects of random measurement errors.

GHI scores are calculated using the process described in Box 1.2, and the complete formula is shown in Appendix A. The current formula was introduced in 2015 and is a revision of the original formula that was used to calculate GHI scores from 2006 to 2014. The primary differences are that child stunting and child wasting have replaced child underweight, and the four indicator values are now standardized (Wiesmann et al. 2015).

### Box 1.1 Concepts of Hunger

The problem of hunger is complex. Thus there are different terms to describe its different forms.

**Hunger** is usually understood to refer to the distress associated with lack of sufficient calories. The Food and Agriculture Organization of the United Nations (FAO) defines food deprivation, or undernourishment, as the consumption of too few calories to provide the minimum amount of dietary energy that each individual requires to live a healthy and productive life, given his or her sex, age, stature, and physical activity level.*

**Undernutrition** goes beyond calories and signifies deficiencies in any or all of the following: energy, protein, or essential vitamins and minerals. Undernutrition 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 child-care 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.

*In estimating the prevalence of undernourishment, FAO considers the composition of a population by age and sex, taking into account the range of physical activity levels of the population and the range of healthy body masses for attained height to calculate its average minimum energy requirement (FAO/IFAD/WFP 2015). This requirement varies by country—from about 1,650 to more than 2,000 kilocalories (food calories) per person per day for developing countries in 2016 (FAO 2017b).

¹ For further background on the GHI concept, see Wiesmann (2006a).

² According to recent estimates, undernutrition is responsible for 45 percent of deaths among children younger than five years old (Black et al. 2013).
for some high-income countries where the prevalence of hunger is very low. Even within certain high-income countries, however, hunger and undernutrition are serious concerns for segments of the population. Unfortunately, nationally representative data for three of the four GHI indicators—undernourishment, child stunting, and child wasting—are not regularly collected in most high-income countries. While data on the fourth GHI indicator, child mortality, are usually available for these countries, child mortality does not reflect undernutrition in the high-income countries to the same extent as it does in low- and middle-income countries. For these reasons, GHI scores are not calculated for most high-income countries. In addition, GHI scores are not calculated for certain countries with small populations, nor for certain nonindependent entities or territories.

The GHI is only as current as the data for the four component indicators. This year’s GHI includes the most recent country-level data from 2012 through 2016. Thus the 2017 GHI scores reflect hunger and undernutrition levels during this period rather than in the year 2017.

Because data for all four indicators in the GHI formula are not available for every country, GHI scores could not be calculated for some, including Burundi, the Comoros, the Democratic Republic of Congo, Eritrea, Libya, Papua New Guinea, Somalia, South Sudan, and Syria. All available indicator values for these countries appear in Appendix C. Additionally, Box 2.1 of Chapter 2 explores the food and nutrition security situation of those countries without GHI scores where hunger is cause for significant concern.

GHI scores are based on current and historical data that are continuously being revised and improved by the United Nations (UN) agencies that compile them. Each year’s GHI report reflects these changes. As a result, GHI scores from different years’ reports are not directly comparable with one another. This report contains GHI scores for 2017 and three reference years—1992, 2000, and 2008. To track the progress of a country or region over time, the 1992, 2000, 2008, and 2017 scores within this report can be compared.

The GHI scores presented here reflect the latest revised data for the four component indicators. Where original source data were unavailable, estimates for the GHI component indicators were based on the most recent available data. Appendix C provides more detailed

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**FIGURE 1.1 COMPOSITION OF THE GLOBAL HUNGER INDEX**


Note: The values of each of the four component indicators are standardized. See Appendix A for the complete GHI formula. SDGs = Sustainable Development Goals. The source for undernourishment data is the Food and Agriculture Organization of the United Nations (FAO); the source for child mortality data is the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME); and the primary sources for the child undernutrition data are the World Health Organization (WHO), World Bank, and UNICEF.


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 2017 GHI scores. Undernourishment data for the 2017 GHI are for 2014–2016 (FAO 2017b; authors’ estimates).

**CHILD WASTING AND CHILD STUNTING:** Data on the child undernutrition indicators—child wasting and child stunting—are drawn from the joint database of UNICEF, the World Health Organization (WHO), and the World Bank, as well as from the WHO’s continuously updated Global Database on Child Growth and Malnutrition, the most recent reports of the Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS), and statistical tables from UNICEF. For the 2017 GHI scores, data on child wasting and child stunting are from the latest year for which data are available in the period 2012–2016 (UNICEF/WHO/World Bank 2017; WHO 2017; UNICEF 2017; UNICEF 2013; UNICEF 2009; MEASURE DHS 2017; 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 2017 GHI scores. For the 2017 GHI, data on child mortality are from 2015 (UN IGME 2015).

The GHI incorporates the most up-to-date data available. Yet time lags and data gaps persist in reporting vital statistics on hunger and undernutrition. The United Nations’ Sustainable Development Agenda acknowledges the need for more reliable and extensive country data on hunger and nutrition, and we applaud the efforts to improve the breadth and depth of available data. We encourage further improvements in collecting high-quality data on hunger and undernutrition, which 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.

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**Box 1.2 OVERVIEW OF GHI CALCULATION**

GHI scores are calculated using a three-step process.

**First,** values for each of the four component indicators are determined from the available data for each country. The four indicators are undernourishment, child wasting, child stunting, and child mortality.

**Second,** each of the four component indicators is given a standardized score on a 100-point scale, based on the highest observed level for the indicator globally.

**Third,** standardized scores are aggregated to calculate the GHI score for each country, with each of the three dimensions (inadequate food supply, child mortality, and child undernutrition, which is composed equally of child stunting and child wasting) given equal weight.

This calculation results in GHI scores on a 100-point scale, where 0 is the best score (no hunger) and 100 is the worst. In practice, neither of these extremes is reached. A value of 0 would mean that a country had no undernourished people in the population, no children younger than five who were wasted or stunted, and no children who died before their fifth birthday. A value of 100 would signify that a country’s undernourishment, child wasting, child stunting, and child mortality levels were each at approximately the highest levels observed worldwide in recent decades. (Appendix A provides a detailed guide to calculating and interpreting GHI scores.)

The scale below shows the severity of hunger—from low to extremely alarming—associated with the range of possible GHI scores.

**GHI Severity Scale**

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 9.9</td>
<td>low</td>
</tr>
<tr>
<td>10.0–19.9</td>
<td>moderate</td>
</tr>
<tr>
<td>20.0–34.9</td>
<td>serious</td>
</tr>
<tr>
<td>35.0–49.9</td>
<td>alarming</td>
</tr>
<tr>
<td>50.0 ≤</td>
<td>extremely alarming</td>
</tr>
</tbody>
</table>

Source: Authors.