The hunger metrics mirage: There’s been less progress on hunger reduction than it appears

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As the timeframe for achieving the Millennium Development Goals (MDGs) came to an end in 2015, the United Nations lauded great progress, calling its MDG campaign the “most successful anti-poverty movement in history” (1). In its final progress report, the United Nations states that poverty has decreased by half and hunger has fallen dramatically (1). Sixty countries are said to have achieved the hunger-reduction target since 1990. Among the achievers are a strikingly large number of the so-called “least developed countries,” and many of them are the poorest countries of sub-Saharan Africa. There is no doubt that much of the developing world made significant progress in enhancing food supplies and reducing hunger over the past 25 years. However, tracking progress by country and across countries has been marred by the ambiguity of the metrics that have been used.

The MDGs are internationally agreed goals that were adopted in 2001 to operationalize the Millennium Declaration, a commitment made in 2000 by representatives of 189 nations to fight extreme poverty in its many dimensions. Under this declaration, nation states pledged “to halve, by the year 2015, the proportion of the world’s people whose income is less than one dollar a day and the proportion of people who suffer from hunger” (2), which later became the first (MDG 1) of eight total MDGs. To monitor progress toward each goal, a set of specific targets and indicators were adopted by the United Nations. Among these is the hunger target (MDG 1c) of halving the prevalence of undernourished, or the proportion of people below the minimum level of dietary consumption, between 1990 and 2015 (3). A reduction in prevalence is an important metric; it shows progress being made toward hunger reduction, especially at a global level. But it could also overstate the relative achievement of individual countries with high fertility rates.

The year 2015 also marked the end of the monitoring period for the World Food Summit (WFS) goal, which preceded the MDGs. At the WFS in Rome in 1996, representatives of 182 nations pledged, “to eradicate hunger in all countries, with an immediate view to reducing the absolute number of undernourished people to half their present level no later than 2015” (4). The number of undernourished would be those who fall below the minimum level of dietary consumption for a given country and year (3). The WFS goal has been monitored by the Food and Agricultural Organization (FAO) of the United Nations, over the same 25-year reference period as the MDGs, from 1990 to 2015.

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Fig. 1. (A) Absolute versus relative progress toward achieving the International Hunger Targets, 1990–2015 (from refs. 5 and 8–10). (B) The divergence between the prevalence and the absolute hunger metrics relative to population growth, 1990–2015 (from refs. 5 and 7–10).
However, there’s one important distinction between the WFS goal and MDG 1c. The WFS calls for halving the “absolute number” of undernourished as opposed to the “prevalence” of undernourished by 2015. Although this may seem like a subtle detail, it has a considerable effect on the way progress toward hunger reduction is tracked.

To fully grasp the difference between the two internationally agreed hunger goals, it is essential to understand how a reduction in prevalence differs from an absolute reduction in number. Prevalence of hunger is a fraction of the number of undernourished people to the total population, for a given country and a given year. A reduction in prevalence can only be achieved through a decrease in the numerator or an increase in the denominator. Over time, as the denominator increases through population growth, the size of the reduction in the numerator needed to achieve MDG 1c decreases. As a result, countries that have made small progress in reducing their absolute number of undernourished people may still come close to or even reach MDG 1c if they experienced a large enough population increase over the reference period.

Hence the “hunger metrics mirage,” in which countries with rapid population growth are deemed to have made more progress in hunger reduction than they actually have. Higher population growth shows progress on the prevalence metrics, when in fact rampant growth only exacerbates the problem of hunger. A prevalence-based hunger score card can mislead policymakers into thinking they are on track toward hunger reduction and lead to complacency or reduced priority for hunger-alleviation policies.

**Measuring Population Growth and Hunger**

Rapid population growth in developing regions has slowed efforts to reduce global poverty and hunger, so much so that in 2006, extensive hearings were held at the United Kingdom Parliament to address this issue. A report released the following year, entitled *Return of the Population Growth Factor: Its Impact upon the Millennium Development Goals*, provides an analysis of the hearings and cites overwhelming evidence that “the MDGs are difficult or impossible to achieve with current levels of population growth in the least developed countries and regions” (11). This report failed to recognize an important contradiction: higher population growth makes the problem worse, but it also improves the metrics on progress toward the MDGs.

The paradoxical relationship between population growth and the hunger metrics is reflected in Fig. 1, which shows key trends for developing countries that were close to or reached MDG 1c by 2015. The FAO (3) reports that 29 developing countries have achieved both the WFS goal and the MDG 1c target, whereas an additional 31 countries have achieved only the MDG 1c target. The full list of countries that have succeeded in one or both categories is provided in table 2 of the FAO’s latest Food Insecurity Report (3). Fig. 1A compares the percent reduction in the number of undernourished (i.e., absolute progress) to the percent reduction in the prevalence (i.e., relative progress) achieved by each country over the reference period 1990–2015. There are at least a dozen countries that have been deemed to have achieved the MDG 1c target but have seen less than 20% reduction in the absolute number of hungry people during the 1990–2015 time period. Gambia and Rwanda had...
made little progress in reducing the number of undernourished over the reference period, yet both countries reached or came close to reaching MDG 1c. The situation was similar for Niger, Mozambique, Ethiopia, Malawi, and several other countries.

In general, progress in terms of a reduction in prevalence is greater than the percentage reduction in absolute numbers; this is because of growth in a country’s population over time. For countries with low rates of population growth the difference between the prevalence and absolute metrics is small, but for countries with high growth rates the two metrics diverge quite substantially. Fig. 1B shows the divergence between the prevalence and the absolute hunger metrics relative to population growth over the 1990-2015 time period. Not surprisingly, the difference between the two metrics is smaller for countries that have achieved both the MDG and the WFS goals. The divergence between the metrics is strikingly large for countries that have witnessed rapid population growth, such as Ethiopia, Mozambique, and Niger.

Countries that have made absolute progress in hunger reduction are those that had managed to keep their food supply growth at par with or above the rate of growth of population (Fig. 2). Such countries include China, Thailand, and Vietnam. But 31 countries had population growth that outpaced food supplies, coming close to MDG 1c but falling short of WFS goals. Fertility rates for 11 of the 31 countries in this category are among the top 20% in the world (12). Ghana, Angola, and Cameroon are exceptions; they had high population growth rates while still achieving the WFS goal. Ghana’s success can be attributed to high and sustained growth in food supply, whereas the other two met their increased food requirements through imports paid through oil revenues.

**Food Aid**

Although there has been progress in improving domestic food supplies, external food assistance continues to play an important part in reducing hunger prevalence for countries that have chronic food deficits. Not explicitly accounting for food aid in total food supplies adds to the hunger metrics mirage, as it tends to show more progress than what was really achieved by the country itself. In fact, 8 of the 31 countries that came close to or achieved MDG 1c by 2015 were major food aid recipients (Fig. 1).

Some countries have made significant progress in weaning off of food aid (such as Bangladesh and Malawi), but several others continue to have high dependence. Ethiopia, for example, continues to be highly dependent on food aid: it received around 813 million tons in food aid in 2012, which is almost the same as it was in 1990. Although the country has made significant progress in enhancing domestic food supplies, it started from a very low productivity base and, hence, has not been able to meet the demands of a rapidly rising population. Bangladesh and Malawi, on the other hand, witnessed rapid staple crop productivity growth and became close to self-sufficient during the MDG reference period. In 1990 Bangladesh was the largest recipient of food aid; it accounted for 7% of Bangladesh’s total food supplies, which dropped to 1% by 2012. Explicitly identifying a country’s reliance on food aid could help point to the need for prioritizing food-crop productivity growth in its development strategy.

**Moving Forward**

In September 2015, the member states of the United Nations adopted the Sustainable Development Goals (SDGs) “which seek to build on the work of the MDGs and complete what they did not achieve” (13). The 17 goals and 169 targets specified in the United Nations Resolution are designed to holistically address the economic, social, and environmental dimensions of sustainable development. The emphasis on tackling hunger continues in the post-2015 agenda with the SDG’s call for ending hunger and achieving food security and improved nutrition (Goal 2).

The United Nations has stated that indicators are being developed for tracking progress toward the SDG targets (13). In this context, it is essential to critically reflect on methods and metrics used for measuring progress under the MDG framework to avoid the ambiguities of the past. Potential improvements could include the formulation of indicators that focus on absolute progress as opposed to the reduction in prevalence. There is also a need to identify a suite of indicators that track progress toward broader nutrition outcomes, such as reduced micronutrient malnutrition, rather than just the current focus on calorie adequacy. Given the emphasis on country ownership of the SDGs, it is important that the chosen indicators can track change at multiple scales, from the community to the national and global levels.

Finally, it is imperative to conduct an independent expert assessment of the reliability and suitability of the currently available hunger statistics for monitoring progress toward the SDGs. The hunger prevalence estimates depend exclusively on the data made available through the FAO. It calculates the prevalence of undernourished for each country using per capita calorie availability at the national level, as reported in its food balance sheets, and then estimates the distribution of this variable across the national population. The number of hungry people in a country is estimated using country-specific cut-off points of minimum calorie requirement per capita (14).

The data required for deriving the hunger numbers come from self-reporting of production and food supply statistics to the FAO by individual countries. There are questions about the consistency and quality of reporting, especially for the least-developed countries that often do not have the statistics capacity to regularly monitor the state of their food supply. The resulting data gaps are often filled by extrapolating from neighboring regions.
and countries (14, 15). Data quality and consistency for countries facing internal conflict is an added concern.

Eliminating hunger is a global and a national imperative and the SDG agenda hopes to get us there by 2030. Essential for success are investments for enhancing food supply in the least-developed countries of the world. Our quest will also require improved hunger and nutrition statistics and meaningful and reliable metrics for tracking progress toward the “zero hunger” goal.

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