

## **Evidence Brief**

# What Works in Addressing Global Poverty – Food Security

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## Key Points

1. The food security of the world's poorest citizens has improved significantly in recent years, but about one in ten people worldwide are still not properly nourished. More than a fifth of all children are stunted, considered a key indicator of undernourishment.
2. Poverty is the single biggest driver of food insecurity. Because most of the world's poorest people work in agriculture, raising farm productivity is critical to improving nutrition.
3. Conflict, air quality, and digestive disorders are emerging areas of investigation among food security specialists, illustrating the complexity of the issue.
4. With so many approaches to improving food security under consideration, development specialists need tools to quickly assess what works and what does not.

## The Problem

The worldwide fight against hunger has made great strides in recent decades, but some 800 million people, or roughly 10% of the global population, still don't get enough to eat, according to the Food and Agriculture Organization (FAO) of the United Nations.

Determining the extent of food insecurity is not easy. The FAO measures food adequacy by calculating a country's total calorie supply after accounting for production, imports, and exports, then dividing by population to determine average calories per person. It uses survey data to model food distribution, which provides an estimate of how many people consume enough calories to maintain health and how many are chronically undernourished.

This method is subject to a number of biases. Spoilage and waste are not considered. Calorie needs are based on low levels of physical activity, so the actual number of people who don't get enough food for their calorie expenditure may be higher than estimated. Moreover, because a country's total calorie supply is an aggregate estimate, it is of limited value in assessing approaches to improving food insecurity.

Many development specialists consider the prevalence of stunting among children—height significantly below what it should be at a given age—as a reliable indicator of undernourishment. Studying how an intervention affects children's height is the basis of a wide range of food security research, and provides an avenue for researchers to assess food security at an individual level.

According to both national calorie supply measures and stunting prevalence, the share of the global population getting the food it needs has grown considerably over the past 25 years. The undernourished share of the world population has been almost halved. And the share of children with stunting has dropped from more than 32% in 2000 to just over 22% in 2017.

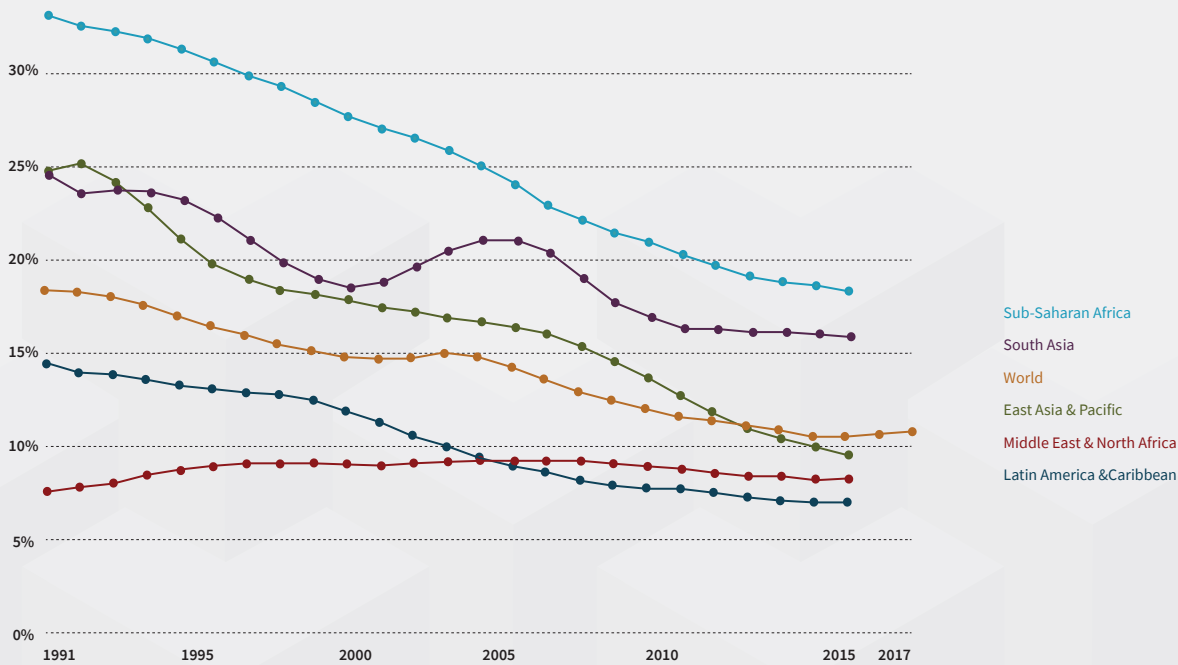
Nonetheless, progress is uneven. Globally, the rate of undernourishment has changed little in the past few years, in part because population growth is higher in the most food-insecure places. Food insecurity is a complex

phenomenon stemming from a variety of causes. In a simplified model, undernourishment reflects two factors: first, the quantity and nutritional quality of food consumed; second, how efficiently the body absorbs nutrients. Development specialists commonly cite five factors that can affect food supply or how well nutrients are metabolized:

### UN Food and Agriculture Organization measure of food security (based on calorie supply)

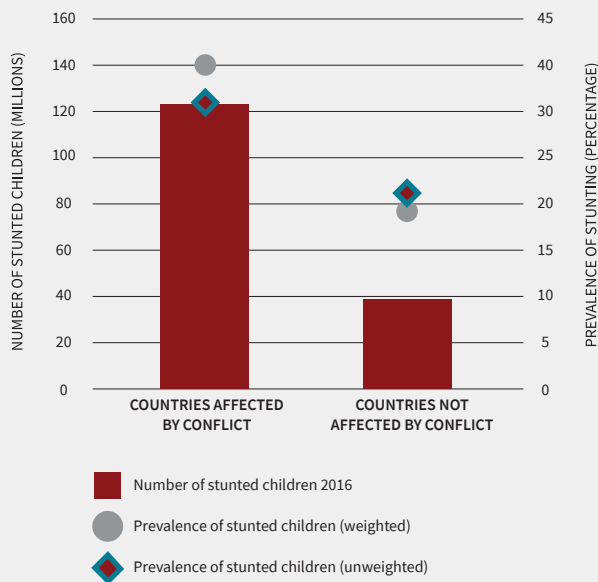
#### Share of the population that is undernourished

*This is the main FAO hunger indicator. It measures the share of the population that has a caloric intake which is insufficient to meet the minimum energy requirements necessary for a given individual. Data showing as 5 may signify a prevalence of undernourishment below 5%. Regional aggregations are based on World Bank regions and exclude high-income countries. They may therefore differ from UN FAO regional figures.*



Source: UN Food and Agriculture Organization (FAO) [OurWorldInData.org/hunger-and-undernourishment/](http://OurWorldInData.org/hunger-and-undernourishment/) • CC BY-SA  
Note: Developed countries are not included in the regional estimates since the prevalence is below 5%

### The Majority of Stunted Children Under Five Years Live In Countries Affected By Conflict



Source: UN Food and Agriculture Organization (FAO)

- **Poverty** is the single biggest driver of food insecurity, limiting a household’s quantity and variety of food.
  - **Conflict** can disrupt food production or markets.
- The majority of stunted children under five live in countries affected by conflict (Food and Agriculture Organization of the United Nations, 2017).
- **Poorly functioning markets** can keep households from earning income from the crops they grow.
  - **Unsanitary conditions** can lead to chronic digestive disorders that impair the body’s ability to absorb nutrients.
  - **Poor soils or a hostile climate** may limit agricultural production or reduce a harvest’s nutritive value.

Improving food security requires identifying the local causes of undernourishment and designing a strategy to mitigate the effects.

## What We've Learned

Researchers have explored a range of **strategies for improving food security**, including raising agricultural productivity; transferring cash to reduce poverty; increasing dietary diversity; improving sanitation; and resolving conflicts. There are significant gaps in the research on these options, in part because some are hard to study using randomized controlled trials.

**Agricultural productivity.** There is solid evidence that reducing poverty is the single most important step to ensure that people are well-nourished. And agriculture is the most important sector for taking people out of poverty. Most people lacking food security are rural and what they grow is their source of wealth. A recent study found that, in poor countries, agricultural productivity gains generally have about twice the poverty-reduction effect of improvements in manufacturing efficiency (Ivanic & Martin, 2018).

**Cash transfers.** Giving people money through conditional or unconditional cash transfers is an obvious way to allow people to eat better. Poverty is a major cause of food insecurity and putting money in people’s pockets alleviates poverty and allows recipients to choose how best to allocate the funds to address their most pressing needs. However, little research has been done on how such programs affect stunting or other food security indicators.

**Diversification.** Dietary diversity, income diversity, and food security are strongly correlated. The poorest, most food insecure households tend to have few sources of income and eat only a few staples. In some cases, those staples may lack essential nutrients. But whether diversification improves food security or is itself a byproduct of rising incomes is controversial in the development community.

Research in Tanzania based on three waves of surveys over multiple years found that growing a greater variety of crops had a small, but significant effect on reducing stunting

among children (Lovo & Veronesi, 2019). Adding animal products to the diet appears to have a larger impact. A study of more than 100,000 children in 49 countries found strong associations between lower levels of stunting and higher consumption of dairy products, meat, fish, and eggs, as well as evidence that eating a variety of animal products is more beneficial than eating just one (Headey, Hirvonen, & Hoddinott, 2018).

**Fortification.** One way to improve nutrition is to raise the nutritional value of crops, for example, by breeding strains of rice with higher vitamin A content or selecting sweet potato varieties that are more efficient at extracting nutrients from soil. A randomized controlled trial found that introducing orange-fleshed sweet potatoes in Mozambican villages significantly reduced the incidence and duration of childhood diarrhea (Jones & De Brauw, 2015). Replacing traditional crops with more nutrient-dense varieties shows promise as a simple and cost-effective way of reaching poor farmers.

**Sanitation.** Raising sanitation standards provides important health benefits, but there is little evidence that the most common sanitary interventions improve food security. Randomized controlled trials in Bangladesh and Kenya found nutritional improvements were associated with childhood growth gains, but adding programs promoting handwashing, hygiene, and sanitation produced no additional benefits (Luby, et al., 2018; Null, et al., 2018). However, it may be that these sanitary measures weren't sufficient to check transmission of intestinal pathogens in communities that lacked clean water and sewerage systems.

**Resolving conflicts.** There is little research on how settling hostilities can improve nutritional status. But given the clear connection between violent conflict and undernourishment, development specialists view defusing these confrontations as among the most important strategies for improving food security.

Several **promising areas of research** are emerging as methods of strengthening both food security and overall health. These include raising the quality of agricultural inputs; emphasizing soil-specific management; improving air quality; and exploring sanitation initiatives beyond the common handwashing and hygiene approach.

**Agricultural inputs.** The effectiveness of inputs such as fertilizer and hybrid seeds is poor in many parts of the world, largely because high-quality products are scarce. For example, a study in Uganda found that none of 369 samples of urea fertilizer had the required 46% nitrogen content (Bold, et al., 2015). Consequently, programs to provide farmers authentic inputs could boost crop yields.

**Site-specific soil management.** Soil nutrient content can vary greatly from one locality to another, especially in the tropics. Research in Tanzania found that levels of sulfur, nitrogen, and phosphorous often differed significantly in nearby communities (Harou, et al., 2017). When distributing fertilizer, it is vital to select products that are adapted to the nutrient limitations of a specific site's soil.

**Improving air quality.** Evidence is accumulating that high levels of particulate matter are correlated not only with health indicators such as child mortality, but also with undernourishment measures like childhood stunting (Heft-Neal, Burney, Bendavid, & Burke, 2018). How air pollution affects digestion isn't well understood, but research suggests that interventions to improve air quality may be beneficial.

**Animals and sanitation.** In many parts of the world, people live close to livestock and poultry, and may corral animals in their homes. Exposure to animal waste could raise risks of intestinal and respiratory infections, and create nutritional deficits. For example, a study in Ethiopia found significantly increased rates of stunting among children who lived in dwellings where poultry were kept indoors (Headey & Hirvonen, 2016).

## Implications

Food security is a complex problem linked to a range of economic, social, political, and environmental factors. There are a number of intervention opportunities with promising outcomes and a few avenues seem particularly important to pursue with the evidence we have currently.

1. Recognize that increased agricultural productivity is a key engine for improving food adequacy. Given the large fraction of the world's poor working in agriculture, finding ways to raise the quantity and quality of the food they grow is probably the single best way for them to become more food secure.
2. Consider interventions based on emerging areas of research. It is increasingly apparent that such factors as conflict, air quality, and intestinal and digestive disorders are food security issues. Addressing them extends the frontier of work in this field.
3. Invest in rapid assessment tools. Ideas on how to improve food security have abounded and often they haven't worked out in practice. We need to understand more quickly what is working and what is not. Our ability to evaluate interventions is expanding quickly thanks to the proliferation of satellite imagery and other digital data.

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