



TURNING ECONOMIC GROWTH INTO NUTRITION-SENSITIVE GROWTH

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There is a growing consensus that reducing childhood malnutrition is a critically important goal, but there is far less agreement on what strategies can best achieve the goal. Are more nutrition-specific interventions required, such as food/nutrient supplements or training and education programs? Or does the answer lie in broader social developments such as rising incomes, increased food security, and better access to education, health, infrastructure, and family planning services? These factors can all be seen as facets of integrated socioeconomic growth, but stakeholders rightly point to examples of economic growth leading to little or no reduction in childhood malnutrition. This does not rule out an important role for economic growth, however, provided that its benefits translate into increased food availability, reductions in poverty, and broader social development—that economic growth is “nutrition-sensitive.”

The Impact of Economic Growth on Nutrition

There is no existing literature that explicitly tests whether these elements of nutrition-sensitive growth really have a large impact on changes in malnutrition over the medium term. Existing research is either country specific or it only focuses on long-run questions, such as why malnutrition rates change across regions (space), rather than across time. This bolsters the need for a dynamic cross-country approach that explains changes in malnutrition over the medium term, which is more consistent with the question of how to achieve the Millennium Development Goals. And in addition to deriving “on average” results, there is also a need to systematically examine the role of economic growth in particular countries. The data can then be used to analyze successes and failures in the war against malnutrition.

Box 1 - Data and methods

Research data for the examination in this brief and accompanying paper come from several sources, which are mined, compared, and cross-referenced to provide a rich collection of indicators, outcomes, and trends. These sources include the Demographic and Health Surveys (DHS), the World Bank’s World Development Index, and the UN’s Food and Agriculture Organization’s Agrostat.

With regard to malnutrition indicators, this brief focuses on stunting prevalence (height for age), since this is the best measure of the cumulative effects of various malnutrition processes (such as dietary deficiencies and exposure to infectious diseases). However, the accompanying paper also tests the sensitivity of results to the use of underweight prevalence and low BMI prevalence for adult women.

Productive Sector Dimensions of Nutrition-Sensitive Growth: A Special Role for Agriculture?

Does overall economic growth explain reductions in malnutrition? And if so, do the sources of that growth—agricultural or nonagricultural—produce different effects on malnutrition? Statistical tests reveal the following:

First, general economic growth (in GDP per capita) predicts reductions in stunting, and the effect is reasonably large. A per capita GDP growth rate of 5.0 percent per year predicts a reduction in national stunting prevalence of around 0.9 percentage points per year. In the longer term, a doubling of GDP per capita would predict a reduction of around 18.0 percentage points. These effects are sizeable, but they also show a lot of variation around the mean: growth leads to reductions in stunting in many but not all cases. This suggests that the sources of growth might matter.

Second, agricultural growth has a large and significant effect in reducing stunting, but only outside of India, where a third of the world’s malnourished children reside. Outside of India, agricultural growth appears to lead to larger reductions in stunting than nonagricultural growth, although the impact of agricultural growth is conditional upon the size of the sector. For example, agricultural growth would be very important for reducing malnutrition in an agrarian economy like Ethiopia, but much less important in an industrial economy such as Singapore. In Indian states, however, there is no evidence that agricultural growth reduces stunting. A stark example is the state of Gujarat, which has experienced extremely rapid agricultural and nonagricultural growth without any significant reductions in malnutrition.

Third, increased food production seems to be the most important linkage between agricultural growth and nutrition. Tests show that increased agricultural growth has a very large effect on average calorie availability, especially when initial calorie availability is low. However, nonagricultural growth seems to have larger effects on dietary diversity. This is consistent with the idea that poor economies first fulfill their basic calorie requirements through domestic food production (since many food staples are basically non-tradable), before rising incomes eventually lead to more diverse diets.

Social Dimensions of Nutrition-Sensitive Growth

A nutrition-sensitive social development index (NUSSDI)

While the source of economic growth matters, it is also important to consider how the benefits of growth are used for social sector development. A large survey-based literature has uncovered significant associations between nutrition outcomes and a range of policy-related social sector outcomes. To see which outcomes systematically explain changes in stunting in a cross-country setting, a range of variables were tested with a view to constructing an index. The strongest relationships hold for four variables: (1) a poverty proxy (ownership of at least one asset), (2) a health proxy (medically attended births), (3) a female education proxy (women's secondary/tertiary education), and (4) a family planning proxy (fertility rates). Infrastructure variables—such as improved water, sanitation, and electricity access—show weak relationships, although they could still be important as parts of an overall development strategy that includes a focus on malnutrition.

The four strongest variables neatly capture several different determinants of malnutrition and may be good proxies for broader socioeconomic dimensions that are relevant to nutrition outcomes, such as gender empowerment (female education, fertility rates), birth spacing and age at marriage (fertility rates), and overall health access (medically attended births). Hence the final nutrition-sensitive social development index (NUSSDI) is an equally weighted sum of these four variables, and it varies between 0 and 100.

This index and its components can be used to answer two questions. First, are improvements in NUSSDI as powerful a determinant of reductions in stunting as economic growth? Second, does economic growth drive changes in NUSSDI? In answer to the first question, there is evidence that improvements in NUSSDI have larger effects on stunting than commensurate increases in GDP per capita. In answer to the second question, the results suggest that economic growth has positive effects on all four components of NUSSDI. For example, the estimates suggest that a doubling of GDP per capita would increase women's secondary education by 14 percent and access to medical births by 18 percent. The effects on asset-based poverty are somewhat weak, although this may be because this measure pertains to extreme poverty. So in general, economic growth does typically bring about significant changes in these four dimensions of socioeconomic development but with large variations across different growth episodes.

Successes and Failures

While formal tests suggest that nutrition-sensitive development typically requires increased food production along with broader socioeconomic developments, it is important to verify these findings with actual country experiences. To do so the study identifies the most successful and least successful nutrition episodes in the dataset in terms of changes in both stunting and underweight prevalence, as the former was not always available. The criteria for success are twofold. First, a country (or Indian state) must show

progress against at least one childhood malnutrition indicator faster than 1 percentage point per year. As it happens, this minimum speed of progress would almost always ensure success in meeting the MDG target of halving malnutrition in 25 years, unless initial malnutrition prevalence was well above 50 percent. Second, there must at least be some progress against the other childhood malnutrition indicator (in other words, a country/state cannot show progress on one front but regress on another). As for the definition of failure, it is defined as a 0.4 percent per year increase in at least one childhood malnutrition variable, and no progress on the other.

For each of these case studies, trends in the determinants of "nutrition-sensitive" development were also documented, including whether the episode was accompanied by rapid economic growth (including in agriculture), increased food availability, and improvements in the four dimensions of NUSSDI. Finally, successes and failures were further categorized into various groups, such as "proven" and "unproven" successes. Proven successes mostly include longer episodes where there were also nutrition-specific programs in place, whereas unproven successes refer to recent episodes that have not yet stood the test of time.

Do the success stories and failures confirm the more formal statistical findings? The short answer is yes, although there are some important caveats.

For example, among the "proven" success stories, relatively strong economic growth—including growth in agricultural production—is prominent. The only significant exceptions to this conclusion are middle-income countries like Brazil and Mexico in the 1980s and Honduras in the late 1990s, where it is possible existing national income was high enough to fund effective social development programs. In all other cases—like Thailand, Vietnam, Tamil Nadu, and Bangladesh—there was quite rapid economic growth, as well as broader socioeconomic developments and nutrition-specific programs in place. The combination of significant agriculture growth and improved social development outcomes is also evident for most Green Revolution episodes (characterized by rapid growth in cereal production) as well as the vast majority of "unproven" success stories with two important exceptions. First, reductions in fertility only feature prominently in the longer-term "proven" success stories. Second, dietary changes show only a weak association with success against malnutrition, although this may be because of measurement error (national food availability is measured rather than the food intake of children or mothers) and because initial dietary conditions vary across countries (in some countries food availability is a problem, in others less so). (See Table 1.)

In terms of failures, a number of episodes in which malnutrition increased are explained by conflict, extreme governance failures, or decreased food availability. But much more puzzling examples of nutrition failures also occur in environments of strong economic growth, including Egypt, Gujarat, and Kazakhstan. The success stories therefore suggest that while nutrition-sensitive economic growth may well be a necessary condition for sustained reductions in malnutrition in low income countries, economic growth is not a sufficient condition for nutritional improvements.

Table 1 — Successful episodes in fighting malnutrition

Episodes	Change in underweight (points per yr.)	Change in stunting (points per yr.)	Better diets (calories, proteins, fats)	Growth >5% per yr. (agric. >3% per yr.)	Favorable health, education, and fertility trends
Proven long-term successes with well-documented nutrition programs					
Bangladesh 1994–2005	-2.0	-2.0	Very rapid	Yes (agric)	Yes
Brazil 1986–96	-0.7	-1.9	Yes	No	Yes (very rapid)
Honduras 1996–2001	-1.3	-1.8	Diversifying	No	Yes
Tamil Nadu 1992–98	-1.9	N.A.	Diversifying	Yes	Yes
Thailand 1982–90	-2.9	N.A.	Very rapid	Yes	Yes
Vietnam 1994–2006	-1.5	-1.3	Very rapid	Yes (agric)	Yes
Green Revolution episodes with marked increases in cereal production					
Bangladesh 1985–94	-1.1	N.A.	Very rapid	Yes (GDP=4.7%)	Yes
India 1977–92	-1.3	N.A.	Very rapid	Yes (agric)	No (exc. fertility)
Philippines 1973–82	-1.9	N.A.	Yes (cereals)	Yes (agric)	Yes (education)
Sri Lanka 1977–87	-1.8	-1.3	Yes (protein)	Yes (agric)	Yes
Unproven short-term successes					
Angola 1996–2001	-1.9	-2.2	Yes	Yes (agric)	Yes (exc. fertility)
Cambodia 1996–2006	-1.4	-1.5	Yes	Yes (agric)	Yes
Ethiopia 2000–05	-1.5	-1.3	Yes	Yes (agric)	Only fertility
Ghana 2003–06	-1.6	-2.5	Yes	Yes (agric)	Only education
Kyrgyzstan 1997–2006	-0.6	-1.6	Modest	No	Yes (exc. fertility)
Punjab 1992–98	-2.8	-1.5	No (decline)	Yes	Yes
Tanzania 1996–2005	-1.5	-0.6	Diversifying	Yes (agric)	No
Uzbekistan 1996–2006	-1.1	-1.9	No	Yes (agric)	Yes (exc. fertility)

Source: Author's construction.

Key Findings

This brief asks if nutrition-sensitive economic growth is an effective strategy for reducing malnutrition, and what that kind of growth looks like. To answer these questions the brief draws on rigorous statistical tests in which productive and social sector outcomes have the most impact on reductions in malnutrition. As with all findings, there are caveats, but the following results are nevertheless intuitive and well supported by the available evidence.

First, rapid economic growth is a necessary condition for sustainably reducing malnutrition at lower levels of development. While the number of sustained success stories is small, there is no example yet of a low-income country significantly reducing malnutrition without longer-term economic growth.

Second, agricultural growth will often have a larger impact on malnutrition than nonagricultural growth, but this advantage is highly conditional upon the size of the sector, the extent to which food insecurity is a problem, and the extent to which agricultural growth delivers increased food availability. The main exception to this statement is that the result does not appear to apply in post-reform India (1992 onward), where around a third of the world's malnourished children reside.

Third, social sector outcomes are also critical components of nutrition-sensitive development. Cross-country evidence suggests that the most robust nutrition-sensitive elements of social sector development are poverty reduction and health,

education, and family planning outcomes. Infrastructure investments may also be important, but the evidence thus far is somewhat weak. And as with overall economic growth, the analysis of successes and failures suggests that these kinds of investments are a necessary but not sufficient condition for sustained reductions in malnutrition.

The main caveats to these conclusions are measurement error and data availability. Data on the quality of diets are weak, and proven success stories are minimal. Hence, it will be important to revisit these inferences in the light of new experiences. There are still no definitive answers as to why there appears to be an agriculture disconnect in India, although existing research suggests that there may in fact be multiple disconnects, with poverty, nutrition, education, health, and family planning policies all regarded as possible suspects.

To go about developing more nutrition-sensitive growth strategies, there are obviously important impediments that need to be overcome. *First, malnutrition is often misperceived by policymakers as a simple food problem, rather than a complex multisectoral problem.* Welcome efforts to raise awareness of the problem mostly focus on outcomes—such as the Global Hunger Index—but more emphasis is needed on inputs, such as the components of the NUSSDI, as well as better tracking of more specific nutrition policies.

Second, researchers and policymakers need to encourage more cross-country learning. Despite notable success stories, remarkably few countries have large-scale multisectoral

nutrition strategies in place, and there is consequently little evidence of cross-country learning. Yet two prominent examples show that it can be done. In Thailand, the main champions of the nutrition program came from health, education, and agriculture, and these champions pushed other policymakers into receiving nutrition education and training from overseas. In Bangladesh, the learning was more explicit, since Bangladesh's Integrated Nutrition Program was adapted from Tamil Nadu's program. But these examples are far too few, suggesting it is essential for researchers to facilitate more cross-country learning, and for policymakers to provide the political impetus to translate knowledge into action.

Concluding Remarks

Results support the plausible hypothesis that economic growth reduces childhood malnutrition through five important channels: increased food availability, reductions in poverty, improvements in female education, increased access to health services, and improved family planning outcomes. Other channels may be important, such as improved infrastructure, but the cross-country evidence is thus far not strong.

The findings go to the heart of the debate about whether nutrition-specific strategies should be pursued, or whether broader development strategies suffice. This is partly a matter of perspective. In the short run, targeted nutrition interventions (for example, food or vitamin/mineral supplements, education/training programs) could have high returns even in the absence of economic growth or broader social sector development. In the longer term, however, a nutrition-sensitive growth strategy is undoubtedly the best means of sustainably eradicating malnutrition. This is because rising national incomes provide the resources to make sustained investments in health, education, and infrastructure, while rising household incomes (along with female education) also improve food security and reduce fertility rates. There are potentially strong synergies between nutrition-specific and nutrition-sensitive interventions, including education and training programs and general investments in women's education. Effective policies to fight childhood undernourishment will therefore be built upon multisectoral programs that contain both of these components.

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