Introduction

This Knowledge Brief presents a profile of the nutrition situation in Mali and cost estimates for implementing key nutrition interventions. It then compares the cost-effectiveness of several scale-up options. The goal of the analysis is to aid the Government of Mali in setting priorities by identifying the most cost-effective packages of interventions and to help leverage additional resources from domestic budgets and development partners.

Malnutrition in Mali

Between 2001 and 2010 chronic malnutrition in Mali declined dramatically, with an annual reduction rate in stunting of 4.4 percent per year. Between 2010 and 2012 there was an increase in stunting as a result of the 2011–2012 crisis, although by 2013 stunting rates had begun to decline again (Figure 1). Children aged 0–12 months in 2011–2012 were particularly affected by the crisis and will likely suffer life-long consequences. In 2013, the most recent year for which statistics are available, 28 percent of children under five were stunted, 17 percent were wasted,
and 9 percent were underweight. Despite recent improvements, these are still unacceptably high levels of malnutrition. In addition, micronutrient deficiencies (hidden hunger) are also prevalent in Mali, with vitamin A deficiency and anemia rates particularly high.

A number of interventions are effective in reducing malnutrition and are consistently identified as being among the most cost-effective development actions, with a huge potential to reduce poverty and boost prosperity. Investing in nutrition can increase a country’s GDP by between 3 and 11 percent annually (Horton and Steckel 2013). Cost-benefit analysis shows that nutrition interventions are highly effective (World Bank 2010, Hoddinott et al. 2013). Investments in early nutrition could boost wage rates by 5 to 50 percent and make children 33 percent more likely to escape poverty in the future, as well as to address gender inequities (Hoddinott et al. 2008, Hoddinott et al. 2013).

Interventions to Reduce Malnutrition

This Knowledge Brief presents the cost of scaling up effective interventions in Mali and compares different scale-up scenarios to determine which one produces the best results for the lowest cost. The analysis considers 10 nutrition-specific interventions that have been shown to be effective in reducing malnutrition (Box 1). The expected results include lives saved, cases of stunting averted, and disability-adjusted life years that would be saved as a result of the interventions. Cost-effectiveness is measured as the cost per life saved, cost per stunting case averted, and cost per disability-adjusted life year saved. We estimate the total costs for scaling up all 10 interventions nationwide, and also three more modest scale-up options: (1) focusing on the regions with the highest burden of malnutrition, (2) scaling up only a subset of interventions, and (3) scaling up a subset of interventions in the regions with the highest burden of malnutrition. We also estimate the cost of scaling up six nutrition-sensitive interventions in sectors other than health with potential for improving nutritional outcomes.

Figure 1. Changes over Time in the Prevalence of Stunting, Wasting, and Underweight, Percent of Children Under Five, 2001–2013


Box 1: Nutrition-Specific and Nutrition-Sensitive Interventions Considered in the Analysis

Nutrition-specific interventions address the immediate determinants of child nutrition:

1. Community nutrition programs for growth promotion
2. Vitamin A supplementation
3. Therapeutic zinc supplement with oral rehydration salts
4. Micronutrient powders
5. Deworming
6. Iron-folic acid supplementation for pregnant women
7. Iron fortification of staple foods
8. Salt iodization
9. Public provision of complementary food for the prevention of moderate acute malnutrition
10. Community-based management of severe acute malnutrition in children

Nutrition-sensitive interventions are delivered through sectors other than health and have the potential to improve nutrition indirectly:

1. Nutrition package delivered as part of a conditional cash transfer program
2. Aflatoxin control in groundnuts
3. Nutrition education via agricultural extension workers
4. School-based based deworming
5. School-based promotion of good hygiene
6. Reaching the Millennium Development Goals (MDGs) for improved access to water and sanitation

Nutrition-Specific Interventions

Implementing 10 nutrition-specific interventions in all regions of Mali would cost $64 million annually with the potential to increase economic productivity by $194 million each year over the productive lives of the beneficiaries (Figure 2). It would also yield a positive net present value and an impressive internal rate of return on the investment of 18 percent. Most of the 10 interventions are cost-effective, with the exception of the public provision of complementary food for the prevention of moderate acute malnutrition, which is not cost-effective according to WHO-CHOICE criteria (WHO 2014).

Given resource constraints, achieving immediate national coverage may not be possible, so we consider various scale-up options and identify two scenarios that are the most cost-effective (Box 2). The costs of the interventions...
estimated here are likely to be slight overestimates, while the benefits are likely to be underestimated. In many cases, actual program costs will be lower than estimated because they can be added to existing programs. Our estimates may underestimate the true benefits since, because of methodological limitations, we are not able to estimate the benefits of some of the interventions we cost.

![Figure 2: Costs and Benefits of Scaling UP 10 Nutrition-Specific Interventions in Mali](image)

**Nutrition-Sensitive Interventions**

We identify and cost six nutrition-sensitive interventions relevant to the Mali’s context, for which there is some evidence of positive impact on nutrition outcomes and for which there is some cost information (the interventions are listed in Box 1). The estimated annual costs are relatively modest: $49.4 million for the nutrition package in the conditional cash transfer program; $1.3 million for aflatoxin control in groundnuts via improved granaries; $19.0 million for nutrition education delivered via agricultural extension workers; $0.3 million for school-based deworming; and $6.2 million for school-based promotion of good hygiene. Although the costs for reaching the Millennium Development Goals for improved access to water and sanitation are unavailable, the World Health Organization reports that the benefits of meeting these targets outweigh their costs two to one (Hutton 2012).

Estimates from other sources suggest that aflatoxin control via improved granaries would cost $272 per disability-adjusted life year saved and school-based deworming $4.55 per life year saved. These results must be considered preliminary approximations, as there are significant limitations in the available data and in the methodological approaches. More robust data on nutrition-sensitive interventions are needed to inform future scale-up priorities.

**Financing Improvements in Nutrition**

Despite the resumption of bilateral development assistance and the mobilization of resources for the response to the crisis of 2011–2012, additional financing for nutrition in Mali will be needed to scale up even the most modest scenarios presented here. At the central government level, there is currently no dedicated budget line item for nutrition. Thus resources will need to be mobilized from national budgets, with additional support from donors. Within the national budgets, it will be important to prioritize health sector funds for nutrition-specific interventions. It will also be important for other sectors—such as water and sanitation and social protection—to engage in the cost-effective nutrition-sensitive interventions the report has identified.

**Conclusion**

Overall, these findings point to a powerful set of nutrition-specific interventions and a candidate list of nutrition-sensitive approaches that represent a highly cost-effective approach to reducing the destructively high levels of child malnutrition in Mali. They also show ways to improve allocative efficiency in Mali’s nutrition programming. Having seen the impact of the recent food crisis on the children, it is critical to realize that an investment in nutrition is also an
investment in resilience. A critical next step is for the Government of Mali and its partners to develop a set of key actions to address undernutrition in the country.

Notes

1 A disability-adjusted life year (also known as a DALY) is equivalent to a year of healthy life lost due to a health condition.

2 All dollar amounts are U.S. dollars

Sources


The Health, Nutrition and Population Knowledge Briefs of the World Bank are a quick reference on the essentials of specific HNP-related topics summarizing new findings and information. These may highlight an issue and key interventions proven to be effective in improving health, or disseminate new findings and lessons learned from the regions. For more information on this topic, go to: www.worldbank.org/health.