Shocks and Malnutrition

Although undernutrition is trending downward globally, 165 million children in low-income countries were stunted (that is, had low height for age) in 2011; others suffered from deficiencies in micronutrients. Overall, undernutrition contributed to 3.1 million deaths in 2011 (Black et al. 2013). This burden reflects underlying conditions of poverty, limited access to health and sanitation, and insufficient time and information for adequate childcare. In addition to being consequences of these protracted obstacles, malnutrition rates are also heightened by climatic, political, and economic shocks.

For example, drought and civil unrest (independently as well as jointly) contributed to increased stunting in Zimbabwe, and subsequently this stunting led to reduced schooling (Alderman, Hoddinott, and Kinsey 2006). Moreover, even a modest rain shortfall, far less dramatic than those that generate international attention, may result in reduced linear growth and schooling (Maccini and Yang 2009). Nor are these negative outcomes confined to conflict- and drought-affected economies; the incidence of low birth weight increased with the economic contraction in Argentina in 2001–2002, with both contraction of gross domestic product and reduced health expenditures per capita independently explaining this outcome (Cruces, Gluzmann, and Lopez Calvo 2012).

Addressing the Acute Crisis of Undernutrition

One of the first signs of undernutrition observed in crises is an increased rate of wasting, defined as low weight for height but also monitored in terms of upper-arm circumference. A child who is severely wasted has a compromised immune system and a heightened risk of dying young. Fortunately, there have been recent strides in managing acute malnutrition by offering nutrient-dense, lipid-based supplements to assist in rehabilitation (Bhutta et al. 2013). Often such supplements are distributed at the community level,

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reducing the cost of the response compared with rehabilitation at clinics and lowering the risk of infections. Still, the care needed to prevent mortality among severely wasted children is appreciable. New approaches to the prevention of wasting in emergencies are being sought, often using prepared supplements similar in composition but smaller in size than those used for rehabilitation. These supplements are designed to be distributed to children within packages of family food assistance during droughts and similar emergencies. While lipid-based supplements have been shown to be cost-effective for treating acute malnutrition, there is less evidence on their role in preventing malnutrition. In one study from Haiti conducted during a period of economic hardship, generalized distribution proved more effective than targeting the children who were malnourished (Ruel et al. 2008). Beyond the issues of supplement composition and targeting, the success of an emergency response remains largely a matter of rapidly establishing an efficient delivery system.

**Recovering from a Nutritional Shock: Can Interventions Promote Catch-Up Growth?**

Worldwide child growth patterns based on cross-sections of age cohorts reveal early deterioration of linear growth rates in children less than 6 months old in low- and middle-income countries. This decline continues until 24 months, after which undernutrition rates apparently level off (Victoria et al. 2010). This evidence, supported by prospective studies of cohorts in five countries, prompts an emphasis on addressing undernutrition in the period between conception and the child’s second birthday, often referred to as the first 1,000 days. Interventions in this period are a priority to promote optimal growth and prevent stunting (Bhutta et al. 2013) and may render populations more resilient to shocks. The most effective strategies to achieve growth recovery from stunting (as opposed to wasting) during early childhood are not yet defined. Nonetheless, the early years in a child’s life, when growth velocity is at its highest, provide the best opportunity for preventing undernutrition.

Debate persists on whether a child who becomes stunted during his or her first two years has appreciable potential to catch up in height relative to peers later in childhood (Prentice et al. 2013). For example, studies with the Young Lives data (a longitudinal set of cohort surveys of about 2,000 children per country born in 2001 in Ethiopia, Andhra Pradesh state in India, Peru, and Vietnam) indicated that there is considerable malleability in stunting as children age, even without any major changes in the economic or environmental conditions in which the child resides (Crookston et al. 2013). Still, even
if catch-up growth in height is more common than had been believed earlier, it is not yet known what interventions are able to promote such improvements. Some programs have facilitated catch-up growth, such as one in India in which school feeding apparently reversed the impact of stunting attributable to a severe drought (Singh, Park, and Dercon 2014). However, there are few similar studies from which one can generalize or recommend best practices for cost-effective, low-risk approaches to reversing stunting. The risk comes not only from concentrating resources where the returns are still unknown but from the possibility that obesity may be increased if programs attempt to promote growth on a small frame.

What consequences are expected for a survivor of a drought or economic slowdown if she or he remains stunted? How much catch-up growth matters when an individual becomes an adult depends, in part, on the economic environment. Physical stature is still critical in activities in which strength contributes to productivity and is also important in reducing complications of pregnancy. However, employment opportunities are increasingly skills intensive. In such employment, schooling and cognitive capacity may be more important than physical strength. This is especially true as women enter the nonagricultural labor force (Pitt, Rosensweig, and Hassan 2012). Thus, regardless of whether stature can be enhanced by interventions, if gains in schooling and intellectual ability can be delinked from catch-up growth in stature, the impact of a nutritional shock can be reduced.

**Limiting the Long-Term Consequences of Early Malnutrition**

While cognitive and socioemotional development is subject to many of the same risks as overall nutritional status, interventions, particularly at critical ages, can offset many—albeit not always all—of the negative consequences of such shocks. Interventions reaching disadvantaged children exposed to chronic nutritional and psychosocial risks can promote development and are an important strategy to prevent loss in children’s potential and subsequent impact on national development (Engle et al. 2011). Such strategies are particularly needed in countries with chronic high levels of stunting and may also help to reduce the additional impact of deteriorating nutrition and increased psychosocial risks associated with conflicts and natural disasters. Although experts promote inclusion of early childhood activities in emergency situations (UNICEF 2010), there remains a need for information on effective approaches to reducing the shorter-term impact of shocks on development. Limited information suggests that integrating group-based stimulation for mothers and infants
benefits child learning environments and maternal responsiveness (Morris et al. 2012).

Figure 12.1 illustrates the potential for programs that improve parent-child interaction and learning environments to benefit the development of children experiencing nutritional deficiencies, either chronically or as a result of nutritional shocks. The stylized shock is assumed to be more severe for children in households that already have relatively high risks of malnutrition. These children can, however, recover in part with additional assistance. A comprehensive, long-term study in Jamaica found evidence for such a partial recovery. The program studied provided food supplements as well as psychosocial stimulation to stunted children aged 9–24 months for two years through weekly home visits by community workers. Food supplementation had only a modest impact on physical growth, which was no longer apparent by 7 years of age, with some recovery from stunting evident in all children regardless of intervention group (Walker et al. 1996). In contrast, supplementation and stimulation, individually and together, led to improved cognitive skills in early childhood (Grantham-McGregor et al. 1991), and long-term follow-up studies showed that stimulation yielded sustained cognitive benefits and improvements in educational attainment, social behavior, and income in young adulthood (Walker et al. 2011; Gertler et al. 2013).

Similarly, in Bangladesh, psychosocial stimulation with or without modest food supplements (150–300 Kcal/day) given to severely underweight
children 6–24 months old upon discharge from the hospital had an impact on mental development and a small impact on weight for age, but there were no synergistic effects (Nahar et al. 2012). That is, any advantage of having programs provide both nutritional supplements and stimulation is likely to come from administrative savings in joint service delivery and not from the interaction of the forms of assistance. The benefit of stimulation on the development of undernourished children is a highly consistent finding, suggesting that including psychosocial stimulation in programs that respond to undernutrition, whether resulting from shocks or not, would yield improvements in children’s development and longer-term returns on education. Further, integrating nutrition and stimulation interventions does not compromise the impact of the individual program components (Grantham-McGregor et al. 2014).

Cost considerations may be a limiting factor in taking such evidence from small programs to a wider scale, especially when a climate or financial emergency puts a substantial portion of the population at risk. The programs that are most closely studied have shown improvements among children who receive frequent home visits over several months. Although such interventions likely yield attractive benefit-to-cost ratios, especially over the longer term, this approach may be more manageable in terms of capacity constraints when the number of at-risk children is relatively small. More evidence is urgently needed on the effectiveness of other delivery models that use existing infrastructure and services where possible, such as a series of group sessions to provide opportunities to learn and practice responsive, stimulating care. These types of delivery mechanisms may be more practical when a larger number of children are not reaching their potential, especially when those numbers spike following a drought or economic crisis.

Stimulation and childcare influence socioemotional development as well as cognitive skills. Economists recognize that both categories of skills are rewarded in wages and in entrepreneurial activities, and both areas of development benefited in the Jamaica study. The early childhood years are particularly important for brain development and in laying the foundations for cognitive and social-emotional skills. The time frame during which this groundwork is established is not confined to the first 1,000 days that are the focus of many nutrition programs, a fact that has implications for program design. Established programs and services, such as growth promotion, well-baby clinic visits, and vaccination programs in the first one to two years of life promote child health and nutrition and provide opportunities for integrating stimulation programs to benefit development. There remains,
however, a particular need for programs in the window after this age through to the age for initiating preschool and beyond.

Children who attend preschool generally have better cognitive and early academic outcomes than those who do not attend, with greater benefits for children who were more disadvantaged at enrollment. At national levels, preschool attendance rates are associated with reduced disparities in educational outcomes between groups of higher and lower socioeconomic status (Engle et al. 2011). However, preschool enrollment is less universal than is primary enrollment and, particularly where overall rates are low, is skewed toward the relatively well off, in part because of a larger role for private providers in preschools than at other levels of education (Alderman 2011). Therefore, there may be a greater role for demand-side interventions, such as conditional cash transfers, to encourage preschool participation than for interventions that target schooling at later ages. More generally, responding to the impact of shocks on schooling choices, including those mediated by health and nutritional setbacks, is a way for social policies to work toward ensuring that stunted children are not uneducated children as well. Attention to early development through enhancing parental competencies to facilitate children’s development, combined with more equitable access to quality preschool education, can reduce inequalities in cognitive and social skills for young children affected by shocks and thereby limit the longer-term impact of such shocks.

Concluding Comments

Nutrition interventions need to begin prenatally and continue during the first two years of life. Child development interventions also need to begin early, within the first two years. But they must also be continued up to and through school age. While the early years are the most effective time for establishing a foundation for later education and development, there are times that households are overwhelmed and a child falls behind. It is clear, however, that disadvantaged children benefit from additional stimulation and that programs that target psychosocial development help them to make up deficits. The earlier interventions dominate in terms of efficiency, but when these are insufficient or lacking, later interventions are needed for equity.

References


