The economics and nutritional impacts of food assistance policies and programs

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Highlights (3-5 bullets, words < 85 per bullet)

- The performance of domestic private food production and distribution systems matters more to food security than do national public food assistance programs (FAPs) and policies, which in turn matter more than international FAPs. However, FAPs, when designed to integrate effectively with private food production and distribution systems, can provide essential social protection, filling in the gaps left by the private (for-profit) food system and informal (not-for-profit) social safety nets so as to ensure the food security of vulnerable individuals, households and communities.

- Poverty reduction is the most effective food assistance program. Most food insecurity is due to chronic or regular poverty, not due to catastrophic events, such as earthquakes, floods or war that disrupt food production and distribution at scale, although these events can result in episodes of severe food insecurity.

- The returns on investments in FAPs are, on average, high but depend considerably on the targeting and cost structures as well as on food quality and role of complementary activities.

- Further, returns to FAPs vary by targeted population. Returns are highest for the youngest, especially in more remote regions where markets work least well. But, perhaps because the very young have little or no voice, FAPs oriented towards early childhood interventions are less well funded than are interventions aimed at school-age children or at the broader, largely adult population even though these latter classes of interventions offer considerably lower average returns in economic, health, and nutrition terms as best as anyone can tell presently.

Abstract

In this review article, we examine the evidence of the economic and nutritional impacts of international food assistance programs (FAPs) and policies. The returns on investments in FAPs are, on average, high but depend considerably on the targeting and cost structures as well as on food quality and role of complementary activities. Returns to FAPs are highest for the youngest, especially in more remote regions where markets work least well. But, FAPs oriented towards early childhood interventions are less well funded than are interventions aimed at school-age children or at the broader, largely adult population even though available evidence indicates that these latter classes of interventions offer considerably lower average returns in economic, health, and nutrition terms. Nonetheless, FAP effectiveness in achieving any of several objectives varies with a range of key factors, including targeting, additionality, seasonality, timeliness, incentive effects, social acceptability and political economy considerations.

Keywords: international food assistance, food aid, (6 words max)
1. Introduction

Carefully designed food assistance programs (FAPs), and related nutritional interventions, have been identified by the Copenhagen Consensus (2008) as among the highest return investments available worldwide. But, as Barrett (2002, pp. 2105) writes “[t]he impulse to action is strong but does not guarantee success. Most nations have implemented food assistance programs of some sort, but many of these have proved expensive, ineffective, or both.” Food assistance encompasses any publicly financed direct food, cash, or voucher transfers, or food subsidies that serve as de facto transfers, for the purpose of increasing the quality or quantity of food consumed, so as to improve recipients’ health and nutritional status. Food assistance is closely related to social protection and poverty reduction objectives because ill health and malnutrition are strongly correlated with poverty, measured in any of several ways. In this paper, we review the economics and nutritional impacts of food assistance policies and programs with an eye toward extracting key lessons useful to national and international policymakers.

![Global cereal production, trade, and food aid, 1970-2009](image)

**Figure 1: Cereals production versus commercial trade and food aid**

Perhaps the most important lesson is that FAPs are necessarily small relative to the broader food system on which people rely for daily nourishment, so any public food assistance policy or program must be designed to integrate effectively with the private food production and distribution system.
Globally, 85-90 percent of global cereals production is consumed in the country in which it is grown in any given year; only 11-12 percent of global food production is internationally traded in any given year even though trade has been growing faster than output over the past 40 years (Figure 1). International food aid is far smaller still, amounting to less than one-quarter of one percent of total food production and only 1.9 percent of commercial international food trade. Moreover, most international food aid is now purchased primarily in developing countries, not in donor countries, with much of it bought in surplus regions of the recipient country under “local purchase” programs. Furthermore, international food assistance is dwarfed by national programs. Global food aid amounts to less than $5 billion annually, as compared to, for example, nearly $90 billion spent by the United States government each year on public FAPs (school breakfast and lunch programs, Supplemental Nutrition Assistance Program, etc.). And even in the countries with the largest FAPs, these are small compared to the broader food economy. For example, India’s targeted public distribution system (TPDS) comprised only about 16 percent of total foodgrains produced in 2009-2010 (Government of India, 2011) while the United States’ domestic FAPs account for less than ten percent of a food economy of more than $1 trillion annually.¹ For this reason, the performance of the domestic private food production and distribution systems matter more to food security than do national public food assistance policies and programs, which in turn matter more than international FAPs. In designing and evaluating food assistance policy, it is crucial to keep this ordering of the key sources of populations’ diet firmly in mind.

Food assistance policies and programs can nonetheless provide essential social protection, filling in the gaps left by the private (for-profit) food system and informal (not-for-profit) social safety nets so as to ensure the food security of vulnerable individuals, households and communities. A growing literature underscores the importance of social protection for economic growth and poverty reduction (Carter and Barrett, 2006, 2007; Alderman et al., 2006; Barrett et al., 2011). The safety net provided by food assistance and other social protection programs reduces individuals’ and households’ catastrophic risk exposure and encourages savings, investment and adoption of improved technologies, all of which contribute to increased incomes and enhanced food availability and access.

This leads directly to the second key lesson, that poverty reduction is the most effective food assistance program. Most food insecurity is due to chronic or regular² poverty, not due to catastrophic

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¹ In terms of reach, India’s TPDS is even smaller. Khera (2011) in a study of the TPDS in Rajasthan, India reports that 67 percent of TPDS wheat and 18 percent of TPDS rice failed to reach consumers.

² Regular poverty includes both periodic (e.g., seasonal) episodes due to seasonality in incomes and prices as well as aperiodic spells associated with temporary unemployment, episodes of ill health, or other recurring adverse events specific to individuals or households.
events, such as earthquakes, floods or war that disrupt food production and distribution at scale, although these events can result in episodes of severe food insecurity (Barrett, 2010). Devereux et al. (2008) point to regular seasonal shortages and associated price increases as a source of food insecurity for landless laborers and smallholder farmers. Krishna (2004) highlights the sizeable entry and exit of households into and out of poverty in India. Wilde and Nord (2005, pp. 430-431) find that US food stamp eligible households “do not come in constant ‘secure’ and ‘insecure’ varieties. Instead, it appears that unobserved hardships strike from time to time, with large effects both on [food stamp] program participation and food security”.

Malnutrition contributes to individuals remaining trapped in poverty (Thomas and Strauss, 1997). In a review of maternal and child undernutrition, Bhutta et al. (2008, pp. 340) writes “height-for-age at 2 years was the best predictor of human capital and ... undernutrition is associated with lower human capital. We conclude that damage suffered in early life leads to permanent impairment and might also affect future generation.” Krishna (2007) documents how poor health, commonly associated with undernutrition, can lead to chronic impoverishment. In turn, poverty contributes to poor nutrition and health. Victora et al. (2008, pp. 340), reviewing findings on maternal and child undernutrition and human capital and risk of adult diseases, find “undernutrition [at two years of age] was strongly associated ... with shorter adult height, less schooling, reduced economic productivity, and – for women – lower offspring birth weight.”

Adverse shocks experienced in utero, such as maternal undernutrition, illness, or smoking or drinking habits, can result in lasting health effects, disability, and lower educational attainment and adult wages for unborn children. The fetal origins hypothesis posits that the effects of the in utero environment are lasting and can be latent for many years. In a review of findings on the fetal origins hypothesis\(^3\), Almond and Currie (2011) write that much of the findings are associational rather than causal although this is changing rapidly as evidence mounts. Furthermore, undernutrition in the early years may impact future generations as, for example, children born to mothers who were themselves undernourished as children are more likely to suffer low birthweight (Victora et al., 2008; Berhman et al., 2009).

This intergenerational transmission of undernutrition is closely related to the concept of nutritional poverty traps. A nutritional poverty trap occurs when individuals’ physical work capacity

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\(^{3}\) This is also known as the Barker hypothesis for Barker’s work linking undernutrition of pregnant women with the later health of their adult children. See, for example, Barker (1992).
declines more rapidly than wages once the wages (and the nutrition it can buy) falls below a critical level. Thus, in equilibrium there will be some critical asset holding such that those with at least that level obtain employment and reach a non-poor standard of living, while those below that critical level will remain mired in poverty and malnutrition (Dasgupta and Ray, 1986, 1987; Dasgupta, 1993, 1997). Given the strong, bidirectionally causal relationship between poverty and malnutrition, FAPs are commonly viewed as an important element of holistic poverty reduction strategies.

**Key concepts**

The objective of food assistance policies and programs is to reduce hunger, undernutrition and/or food insecurity. It is important, therefore, to understand the key distinctions among those (and related) concepts. Hunger reflects the physical discomfort caused by a lack of food (NRC, 2005). Undernutrition reflects insufficient dietary energy (caloric) intake. It is closely related to, and typically proxied by, anthropometric measures of undesirable nutritional status, such as underweight (weight-for-age), wasting (weight-for-height), stunting (height-for-age) or mid upper-arm circumference at least two standard deviations below global reference values. Malnutrition refers to undernutrition, obesity and micronutrient (mineral and vitamin) deficiencies, thereby reflecting the full “triple burden” of nutritional problems faced by many poor communities.

All such measures are proxies for the intrinsically unobservable condition of “food insecurity,” typically defined as the complement to food security. Food security is commonly conceptualized as resting on three pillars: availability, access, and utilization. Some agencies, such as the United Nations Food and Agriculture Organization (FAO), consider stability to be a fourth dimension of food security. The pillars of food security are nested, that is, food must be available for individuals to access it, and without access to food, individuals cannot utilize food or rely on food as a stable resource (Webb et al., 2006; Barrett, 2010). The causes of food insecurity are many and can result in availability, access, or utilization failures (Barrett, 2002).

As we discuss in the next section, FAPs are best understood as trying to address one or more of these pillars. But FAPs rarely attempt to address the underlying structural causes of food insecurity, focusing instead on proximate causes associated with food intake. Most FAPs address access (e.g., through the provision of transfers or food subsidies), but some are utilization interventions coupled with health care, nutrition education or other complementary inputs to the production of good nutrition and

4 What follows in the next few paragraphs draws heavily on Barrett (2010) and Barrett and Lentz (2010).
health in order to improve utilization of food. Availability interventions through broad-based food aid deliveries are on the decline, although fortification remains an important availability intervention.

Other important interventions that are not FAPs include social protection (SP) programs, therapeutic feeding programs, and private initiatives. SP programs are broader than FAPs, often trying to ensure an adequate standard of living more generally, not just in nutritional or food security terms. As a result, SP often includes FAPs but also add labor market policies – such as employment guarantee schemes – or insurance arrangements to protect against disability and illness. Although most SPs’ primary objective is to reduce poverty and vulnerability, they often result in related improvements to food security, health, and educational attainment. In contrast to the broad mandates of SP programs, therapeutic feeding programs tightly focus on alleviating moderate to severe acute malnutrition (i.e., wasting and edema) through delivery of therapeutic foods (e.g., ready to use therapeutic foods – RUTFs – such as PlumpyNut) at community-based therapeutic centers and in-patient feeding centers. Therapeutic foods and approaches necessary to treat acute malnutrition are medical interventions, and thus fall outside of FAPs, which do not include medicines. Finally, a third category of assistance outside of the public food assistance domain is private initiatives, such as in-kind payments for informal labor, as well as transfers through charitable organizations, such as church meals, Meals on Wheels, food banks and other community arrangements, in addition to private, interpersonal gifts. Such private initiatives undoubtedly play important roles in many communities, especially for individuals and households who lack access to, or may otherwise not be eligible for, or are unwilling or unable to apply for, formal, public food assistance (Bhattamishra and Barrett 2010).

2. A typology of food assistance policy instruments

In the remainder of this article, we restrict attention to food assistance policies and focus on the nutrition outcomes and cost efficiency evidence from FAPs that are “nutrition-sensitive” (Nabarro, 2010). Nutrition-sensitive FAPs include programs such as school feeding, which may not have a specific or primarily nutritional objective but which, nonetheless, may improve nutritional outcomes. Further, the type of nutritional objective can influence cost efficiency. Reducing (moderate or severe) acute malnutrition may be more expensive than addressing specific micronutrient deficiencies, protein-calorie undernutrition. Other factors also influence the effectiveness of different FAPs, including targeting, additionality, timeliness, seasonality, incentive effects, and social acceptability considerations. We return to these factors in section three, highlighting in greater detail the available evidence on how each factor influences FAP effectiveness. In section four, we consider the political economy of FAPs,
discussing in particular the tradeoff between enhancing efficiency and impact through accurate targeting and securing and maintaining political support for programs (Pinstrup-Andersen, 1993). FAPs generally address access and stability failures but can also address availability and utilization failures. In this section, we briefly cover the latter two areas before moving to access and stability. Before launching into those details, however, it is worth noting a few broad trends.

First, food assistance has undergone a rapid shift toward more market-oriented, cash-based assistance in the past several decades. This is apparent in national programs where, for example, the United States has relied increasingly on support through vouchers, moving its food stamp program (now known as the Supplemental Nutrition Assistance Program, or SNAP) entirely to electronic benefit transfers in 2004. The shift is easiest to document, however, in international FAPs. In 1996, the European Council agreed to untie its food aid, that is, to allow the purchase of food aid from outside the donor’s borders, allowing for local and regional procurement (LRP). The European Commission has been steadily broadening its approach, allocating an increasing proportion of funds to cash and vouchers (Gaus et al., 2012). Canada started to untie its food aid in 2005 and untied all aid by 2008. While US food aid is still overwhelmingly transoceanic in-kind food aid, this is changing as well (Hanrahan, 2009). Following the successful use of innovative transfers in response to the East Asian tsunami in 2004, the use of cash and vouchers has taken off, although relatively few cash and voucher projects have been at scale (Harvey, 2007). Thus, while LRP comprised 13 percent of food aid by metric tons in 1994-95, by 2010, LRP was approximately 67 percent of all food aid by metric tons (Upton and Lentz, 2012).

Second, this shift away from tied, in-kind food aid toward greater flexibility parallels a growing use of food assistance to respond to emergencies. In 2008-9, 75 percent of global food aid was used in emergency response whereas in the 1980s, food aid for emergencies was less than 20 percent (Barrett et al., 2012). Importantly, the volume of total food aid deliveries has fallen during this time. From a high of 15 million metric tons delivered in 1999, in 2009, the volume of food aid delivered has fallen to only 5.4 million metric tons. Barrett et al. (2012, p.3) argue that some of this focus on food aid for emergencies reflects findings from research and practice that “in-kind food transfers are rarely the best tool for addressing chronic poverty and food insecurity, but commodities can be essential in humanitarian response.”

Third, there is now a greater emphasis on targeting and away from generalized feeding programs. This increased emphasis on targeting is partially in response to declining food aid volumes and partially in response to research from the late 1990s and early 2000s demonstrated that many FAPs
failed to reach a sizable portion of the population who needed the transfers most (Coady et al., 2004). Thus, as food aid has become more scarce, agencies try to reach the right people through better targeting. Simultaneously, food aid has become much more likely to be used in emergencies than for untargeted food deliveries (e.g., monetized and program food aid – bilateral food aid sold or distributed by recipient governments), for which funding has fallen sharply.

Fourth, donors, local governments, practitioners, and recipient communities increasingly recognize - and emphasize - food quality to address nutritional concerns and improve utilization in FAPs. The movement away from calorie delivery toward more nutritious commodity baskets has spurred development and refinement of processed commodities, such as corn-soy blend (CSB). In the 1970s, wheat and wheat flour comprised nearly 80 percent of delivered food aid; by 2009 it had dropped to one-quarter of deliveries (Barrett et al., 2012). Nonetheless, it was the most commonly distributed product in 2009 (Upton and Lentz, 2012). Thus, while the nutritional quality of food aid is improving, there remains considerable scope to improve outcomes further (Webb et al., 2011, USGAO, 2011).

**Availability interventions**

The main availability interventions relate to deliveries of commodities or nutrients to communities with demonstrable shortfalls. This once was important, as many countries could not produce nor commercially import sufficient food to meet their population’s needs. But as food markets have increasingly integrated over space and time, the role of availability-oriented FAPs has shrunk, especially for delivery of macronutrients (energy, fat, protein) readily available through commercial food markets. Increased market integration is a principle reason why the past two decades have witnessed a sharp decline in global food aid deliveries (Figure 2). Global food aid deliveries have declined 64 percent since 1999, and even food aid donations by the United States, which for domestic political economy reasons has remained more attached than other donors to in-kind commodity shipments, has fallen 68 percent.
Despite the reduced need for or use of broad-scale food delivery programs to augment nutrient availability, FAPs aimed at improving the availability of specific micronutrients have expanded. But most such programs operate through commercial markets. Mineral and vitamin fortification programs, including regulations on or incentives to food processing (e.g., mandatory iodization of salt, vitamin A fortification of sugar, iron fortified flours), are relatively cost effective interventions. Firms can typically pass some (or all) of the fortification costs on to consumers and achieve low per unit cost by fortifying products at scale. Fortifying products often purchased on the market rather than distributing products through parallel non-commercial channels that compete with locally produced products can increase the reach of the fortified goods. The provision of mineral and vitamin supplements also aims to address a lack of availability of particular micronutrients, although the distribution of supplements is commonly both more expensive and less effective than fortification due to limited consumer uptake.

Horton et al. (2010), using the 2008 *Lancet* series on Maternal and Child Undernutrition as a starting point to identify which micronutrients ought to be used in fortification processes, cost out universal coverage of salt iodization and universal iron fortification of staple foods for the 36 countries with the highest burden of undernutrition for the SUN framework. They estimate that iron fortification of staple foods will cost approximately $0.20 per year per person while salt iodization will cost approximately $0.05 per year per person. The estimated annual financing needs to cover the target population in the 36 priority countries are about $600 million for iron fortification and $80 million for
salt iodization, although one-time investments in production technologies totaling $500 million will be required for iron fortification and iodization. Under their costing estimates, Horton et al. (2010) report that 1.2 billion more people would have access to iodized salt and 2.8 billion more people would have access to iron fortified foods. Horton et al. (2008) also cost out vitamin A supplementation for children between 6 and 59 months. They estimate a cost of $1.20 per child per year, or additional annual cost of about $130 million.\(^5\)

Meenakshi et al. (2010) summarize cost estimates for iron and vitamin A fortification and supplementation, noting a general lack of evidence. The authors write, “vitamin A fortification and supplementation cost between $20 and $55 per [disability adjusted life year] DALY averted in Asia and Africa, assuming a 50% coverage rate. Iron interventions cost $40–70 per DALY averted in Asia; costs in Latin America are much higher. Costs for higher coverage rates (such as 80% or 95%) are typically higher” (p. 71-72). Furthermore, these costs vary depending on whether fortification or supplementation is pursued.

As availability-oriented FAPs have concentrated increasingly on augmenting the supply of specific micronutrients, their role in food assistance policy has shrunk markedly and they have become increasingly the domain of nutrition-sector interventions and public health services. The evidence available, however, clearly points to high payoffs from micronutrient fortification. For example, the 2008 Copenhagen Consensus Expert Panel ranked micronutrient fortification among the top three international development priorities, emphasizing in particular fortification with iron and iodine, on the basis of benefit-cost analysis (Horton et al., 2008).

**Utilization interventions**

Utilization interventions include several different approaches, including nutritional education programs, water and sanitary health interventions, and health interventions, such as deworming. Few could be properly classified as FAPs. The precise roles for education and behavior change in addressing undernutrition and food insecurity, particularly among non-poor households, remain debated. Evidence indicates that poverty, while a primary factor of undernutrition and food insecurity, is not the only cause, suggesting a valuable role for utilization interventions. For example, Horton et al. (2010) report

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\(^5\) Horton et al. (2008) also note that although measuring zinc status is difficult and thus the amount of and frequency with which individuals need zinc is not well understood, zinc can nonetheless be valuable in treating diarrhea and early evidence has linked zinc with better growth and lower mortality and morbidity rates. They report the cost of zinc supplementation is $0.47 per course of treatment.
findings by Gwatkin et al. (2003) that over 25 percent of Indian children living in households with the highest quintile of income had weight-for-age lower than two standard deviations below the mean.

One well-known program focusing on improving utilization of food is the Honduran AIN-C program (Integrated Attention to Childhood in the Community) (Horton et al., 2010). Under the program, families with children under age two receive information about childcare practices (but do not receive food assistance transfers). Schaetzel et al. (2008) reports that compared to families not participating in AIN-C, exclusive breastfeeding rates, iron and vitamin A supplementation rates, and immunization rates were all higher for AIN-C participants. Further, AIN-C participants, especially those from poorer households, had higher weight-for-height Z-scores. Adding up costs associated with specific activities (i.e., an ingredients-based costing approach), Fiedler et al. (2008) find that the cost per child per year of an AIN-C monitoring and counseling program was $6.43 in 2005 dollars.

Combining utilization interventions, such as access to clean drinking water or healthcare, with distribution of foods, can also improve the effectiveness of FAPs, underscoring the complementarity of food and water, sanitation, and health interventions. As discussed below, education or guidance on food preparation can improve nutritional outcomes of food assistance transfers (Dewey and Adu-Afarwuah, 2008; Horton et al., 2010; Webb et al., 2011). Gupta et al. (1977) report that in Uttar Pradesh, India undernourished children under the age of four who received deworming medication in combination with supplementary food had better weight-for-age outcomes than children who received only supplementary food. The authors conclude that in communities with roundworm, deworming should be a component of supplementary feeding (Gupta et al., 1977). Meenakshi et al. (2010) argue that public health interventions to raise awareness about micronutrient deficiencies and change behaviors combined with agricultural developments such as biofortification can generate high returns.

**Access and stability interventions**

In keeping with the entitlements-based understanding of hunger and food insecurity advanced by Sen (1981), most FAPs over the past generation emphasize improving and stabilizing individual or household-level access to food. The range of such interventions is large, so it is helpful to categorize them into four broad classes grouped by who is targeted and ranked by their economic efficiency and growth effects.

**Class I interventions** are FAPs that select and deliver supplemental foods to pregnant women and children under the age of two. A large body of evidence indicates that nutritional deficiencies in the
first thousand days (from conception to age two) can lead to irreversible losses in human capital (Bhutta et al., 2008; Horton et al., 2008; Bezanson and Isenman, 2010; Horton et al., 2010). As a result, Class I interventions typically have the largest impacts, as measured in any of several ways, and are therefore increasingly the focus of food assistance policies. Class II interventions are school feeding programs, which reach school-aged children and which often seek to improve school enrollment with the secondary objectives of improving nutritional and cognitive status. Class III interventions are FAPs that reach the adult population and their families due to either emergency or nonemergency food insecurity. Class IV FAPs reach adults and others who need specific nutritional interventions. While FAPs generally focus on improving undernutrition and reducing food insecurity, interventions, especially Class I interventions, may also seek to address specific micronutrient deficiencies.

**Class I: Prenatal and early childhood interventions**

The first one thousand days are critical for lifetime nutritional status, health, cognitive abilities, earnings and other outcomes (Shrimpton et al., 2001, Bezanson and Isenman, 2010). Maternal, prenatal, and early childhood interventions tend to have specific nutritional orientations. These Class I FAPs are widely regarded as the most impactful and cost-effective food-based interventions available to governments, donors and social services agencies. There are several approaches to addressing specific micronutrient needs of children under 24 months and their mothers including the distribution of targeted vouchers, micronutrient supplements, and targeted supplementary foods and through biofortification.

**Nutrition effectiveness**

One of the best-studied prenatal and early childhood food assistance interventions the US Supplemental Nutrition Program for Women Infants and Children (WIC), established in 1972 to improve the health status of women, infants and children. WIC vouchers are limited to a list of foods with specific nutrients (protein, calcium, iron, vitamins A, B-6, C and D and folate). Abrams (1993), in a review of evaluations of WIC’s impact on birthweight, reports that while several different evaluation methods were used, evidence consistently demonstrates that participation in WIC increases birthweight. Given that low birthweight infants are 40 times more likely to die than normal birthweight (greater than 2500 grams) infants, increasing birthweight is seen as an important pathway to reducing infant mortality. Devaney (2007, p. 16), summarizing a vast literature evaluating WIC, concludes, “WIC participation by infants and children is associated with ... positive effects on child growth, improved dietary status, and greater access to and use of health care.”
Just as part of the effectiveness of WIC comes through its coupling of food assistance with child growth monitoring and health consultations, both complementary feeding and education may be more successful when paired together, although those who are relatively better-off may not need the access intervention of complementary foods as much as the utilization intervention of education. Dewey and Adu-Afarwuah (2008), in a review of complementary feeding evaluations, find that participants in Indian and Bangladeshi projects that include both distribution of complementary foods and nutrition education achieve better growth outcomes than participants in an education-only project. Horton et al. (2010), reviewing complementary feeding interventions, argue that to treat and prevent moderate malnutrition in children ages 6 through 23 months counseling and education on behavior change for caregivers is generally needed, although behavior change programs alone will be less successful in situations where food access or availability is limited.6 Webb et al. (2011) argue for providing guidance and education (e.g., through test-kitchens) for recipients on how to prepare distributed foods to meet specific nutritional goals.

Further, distributing appropriate complementary foods (or weaning foods for children transitioning away from breast-feeding) is important. Webb et al. (2011) make a series of recommendations to improve food aid quality especially for pregnant and lactating women, children 6 through 23 months of age, wasted children, and others. They recommend that fortified blended foods, such as CSB, have upgraded macronutrient contents (i.e., include a dairy source of protein), and be upgraded to improve micronutrient content, that blended cereals and milled grains have upgraded fortificant mixes of vitamins and minerals, and that lipid-based products, such as vegetable oil, have improved micronutrient content.

Lung’aho and Oman (2009), members of the Dadaab, Kenya refugee camps interagency collaboration team on infant and young child feeding, support the idea that children 6 through 23 months old receive access to complementary foods, as the general rations in refugee camps do not provide the complementary foods, especially animal proteins, important for the health of this age group. A fresh food voucher project implemented by Action Against Hunger in the Dadaab camps demonstrated that nutrition of children under five and their caregivers improved through access to a more diverse diet (Trenouth et al., 2009). Vouchers were redeemed for items complementary to the dry rations, including eggs, milk, fresh vegetables and fruits available from vendors within the camps.

6 “Complementary” feeding interventions are considered more suitable for treating and preventing moderate malnutrition while “therapeutic” feeding interventions are suitable for treating severe malnutrition and are generally considered medical interventions (Horton et al., 2010).
Furthermore, mothers brought their children to nutrition programs to collect the vouchers, which improved nutrition program coverage rates and decreased the time spent on case management (Dunn, 2009).

In its 2012 nutrition policy, WFP advocates for the distribution of micronutrient powders, which can be sprinkled onto or mixed into foods, for children 6 through 23 months suffering micronutrient deficiencies. WFP (2012) differentiates micronutrient powder distribution from “[complementary] medical approaches such as high-dose vitamin A capsules or iron/folic acid tablets” because micronutrient powders distribute a blend of micronutrients while medical approaches often address single or few micronutrient deficiencies (p. 15). De-Regil et al. (2011) review results from eight trials from developing countries on the effects of multiple micronutrient powders on anemia, iron deficiency, and growth of children under two relative to no intervention and to iron supplementation. The authors find that home use of multiple micronutrient powders containing at least iron, vitamin A, and zinc reduces anemia and iron deficiency among children aged 6 to 23 months, although growth was not affected.

Yet, food-based approaches may be more valuable than multiple micronutrient powders. Neumann et al. (2003) argue that compared to pharmaceutical approaches, such as micronutrient powders, food-based approaches offer more protection because food is more locally available, because protein-energy malnutrition often coexists with micronutrient deficiencies and because food includes multiple micronutrients and thus may be more able to address deficiencies than single micronutrients or combinations of micronutrients. Meenakshi et al. (2010, p. 65) argue, “ensuring access to a diversified diet is the most sustainable solution for micronutrient deficiency, [but] it is not an immediately achievable solution in many developing countries as poor people lack the purchasing power to afford a diversified diet.”

Biofortification, an emergent food-based approach, has the potential to address common micronutrient deficiencies. Biofortification employs plant breeding techniques to create micronutrient-enhanced varieties of staple crops. Laurie and van Heeden (2012), for example, find that the biofortified orange-fleshed sweet potato, which is rich in beta carotene, is a valuable, and socially acceptable, weaning food in South Africa, where vitamin A deficiencies are common. Miller and Welch (this issue) discuss biofortification in some detail.

Cost effectiveness
Abrams (1993) reports that WIC saves more than it costs, citing, among others, a US Government Accountability Office study that found for each WIC dollar, $2.89 was saved in Medicaid costs in an infant’s first year and a total of $3.50 saved in Medicaid costs from birth to 18 years. Bitler et al. (2005) find that while WIC reaches food insecure households, about one-third of households receiving food stamps are eligible for WIC but do not receive it (Bitler, 2005). The much smaller size of WIC transfers (about $30/month/household in 1996 dollars) relative to Food Stamp transfers ($276/month/household) may explain why some food stamp households did not apply for WIC even though they were eligible.

Complementary foods include macronutrients in addition to micronutrients and thus are valuable for treating not just micronutrient deficiencies but also undernutrition. Making a series of assumptions about coverage rates, duration of treatment, appropriate energy requirements, etc., for the SUN framework Horton et al. (2010) estimate that the cost of complementary feeding to prevent and treat moderate malnutrition for children under two to be $40 to $80 per child per year in 13 priority countries. Treatment of severe malnutrition is estimated to cost much more per child, at $200 per episode. This is one reason why Horton et al. (2010) advocate for prevention. Micronutrient powders tend to be less expensive but are not well-suited for addressing undernutrition. Horton et al. (2010) estimate the distribution of micronutrient powders cost about $3.60 per child for a 60-day course of micronutrients. The authors suggest that targeted children should receive three courses of micronutrient powder between the ages of 6 and 23 months, for a cost of less than $11 per child (Horton et al., 2010).

In an ex-ante analysis of the effect of biofortified foods on DALYs, Meenaskhi et al. (2010) incorporate a series of assumptions about consumption of biofortified foods, micronutrient intake levels, likely micronutrient content of biofortified foods, processing losses, etc. to compute both a percent reduction in micronutrient burden and costs per DALY averted. The authors find that while not directly comparable to other fortification and supplementation costs, and although the costs per DALY averted vary substantially across country, commodity, and micronutrient deficiency, biofortification appears to be a cost effective approach to reducing deficiencies of iron, vitamin A, zinc in Asia and Africa and iron in Latin America. For example, the authors estimated that cost per DALY averted due to adequate iron intake through biofortification of wheat in South Asia is between $1 and $13. However, the authors conclude that traditional fortification appears more cost effective in Brazil for vitamin A and in Latin America for zinc compared to biofortification.
Class II: School feeding programs

Relative to prenatal and early childhood interventions, school feeding is quite generously funded worldwide although the evidence of nutritional impacts remains quite limited. Much of the favorable evidence of school feeding impacts is on educational enrollment rates, participation and cognitive impacts rather than on child nutrition (Afridi, 2011; Alderman and Bundy, 2012). There is, however, strong political appeal of school feeding and reaching children in school is often logistically easier than reaching younger children. Hence the enduring appeal of school feeding programs and their relatively more generous funding, as compared to Class I interventions to benefit pre-school age children and infants and their mothers.

Nutrition effectiveness

WFP (2012, p.16) recognizes that in school feeding programs, nutrition is not an “immediate or primary objective but [such programs] represent an opportunity for improving nutrition outcomes.” Margolies and Hoddinott (2012) note that school feeding programs seem to have the greatest impact where school attendance rates are low and undernourishment is common. For example, Adelman et al. (2008) found that programs funded by the US Food for Education Program resulted in increased consumption for undernourished children, while longer term nutritional outcomes are less clear (Margolies and Hoddinott, 2012). Alderman and Bundy (2012), reviewing several studies of school feeding’s impacts on food consumption and nutritional status, note that multiple studies have found significant impacts on school children participants; indeed, spillover nutritional impacts on recipients’ siblings not yet of school age have been found in both Burkina Faso and Uganda.

Evaluations from school feeding programs confirm that the type of food provided impacts nutritional outcomes. Higher quality foods, such as animal products, fruits and vegetables or micronutrient powders can better address these deficiencies than staple grains (Murphy et al., 2003; Neumann et al., 2003). Incorporating biofortified orange-fleshed sweet potato, which is high in beta-carotene, in a South African school feeding program has been shown to improve vitamin A levels (van Jaarsveld et al., 2005). In a controlled school feeding study in Kenya, primary schools received one of four supplementary mid-morning snacks, which differed by whether the snacks included meat, milk, vegetable oil, or nothing additional to the snack itself (Neumann et al., 2003). Murphy et al. (2003) report that children receiving the milk and meat supplements had higher intakes of several nutrients, include vitamin A, calcium, and vitamin B-12. Furthermore, the meat-supplement group had higher
levels of iron and zinc, and also experienced higher dietary total energy. Murphy et al. (2003) points out that supplemental feeding at school can lead to declines of consumption at home potentially resulting in an increase in dietary quality but not in dietary quantity.

Findings of the importance of food quality in the US concur with findings from South Africa and Kenya. Meyerhoefer and Yang (2011), in a review of the US National School Lunch Program (NSLP) and the School Breakfast Program (SBP), find that much of the impact studies of US school breakfast and school lunch programs focus on obesity rather than on other health or nutrition impacts, such as alleviating micronutrient deficiencies. NSLP has been associated with increases in obesity while SBP participation is not associated with increases in obesity. Meyerhoefer and Yang (2011, pp. 315) indicate that this conflicting finding may be due to different nutritional profiles of foods served at breakfast and lunch: “SBP participation does not increase total calories, but does improve the nutritional profile of foods consumed. In contrast, the NSLP is thought to improve nutrition purely through high levels of food intake at lunch.”

School lunches may be important vehicles for addressing micronutrient deficiencies. Moretti et al. (2006) report that fortifying rice in school lunches in India led to statistically significant declines in iron deficiency anemia from 30 percent to 15 percent for the treatment group while anemia remained essentially unchanged for the control.

Cost effectiveness

In a review of the school feeding literature, Margolies and Hoddinott (2012) find few cost effectiveness studies on school feeding. Coady and Parker (2004) estimate the relative cost effectiveness of promoting school enrollment through conditional cash transfers in Mexico compared to building more schools. They find that demand-side subsidies, such as Progresa, are much more cost effective means to increasing enrollment than supply side interventions. Under Progresa, which started in 1997 as a government-run conditional cash transfer program, mothers receive cash payments based on the school attendance of their children, visits to health clinics and nutritional support. Improved education is just one objective of Progresa (the other two are improved nutrition and health) and therefore, by Coady and Parker’s (2004) estimates any, nutritional benefits are surplus (and cost neutral). Peterson and Le Grand (2011) find that in-kind food funding of the US NSLP is much less efficient than cash funding due, in part, to complex funding processes in the in-kind program. For each one dollar increase in available in-kind funding received, Minnesota school districts obtained $0.60 in food value. Alderman and Bundy
(2012, p.205) conclude that “the strongest direct consequence of school feeding is best viewed as a form of an income transfer to assist low income households”, not as a food or nutritional intervention per se.

Class III: FAPs to address food insecurity by providing safety nets

The class of FAPs that seek to reduce food insecurity for adults (and their children) by providing a safety net is large. In Class III FAPs, the target population is those who need assistance in order to exit poverty or to avoid becoming (further) impoverished. There are numerous types of FAPs that either deliver food directly to recipients or that improve recipients’ ability to access food, such as through voucher programs or cash transfers. The FAPs considered in this class differ by the reliability and duration of the transfer, whether transfers are conditional, the form of transfer, and by objective. The sheer variety of FAPs makes comparisons among them exceedingly difficult. It is also challenging to identify which factor or factors result in differences in nutritional or cost effectiveness outcomes in FAPs.

Nutritional effectiveness

Nutritional impacts of FAPs vary by form of transfer. In general, the percentage of the transfer consumed as food is highest with food transfers, and lowest when FAPs come as cash transfers, with vouchers in the middle (del Ninno and Dorosh, 2003; Ahmed et al., 2010). The vast majority of studies report that the bulk of all food assistance transfers are consumed as food. Estimates from Burkina Faso, Malawi, and Zambia of the total amount of food assistance transfers consumed as food vary between 60 and 90 percent (Devereux et al., 2006; Harvey and Marongwe, 2006; Harvey and Savage, 2006; CRS/Burkina Faso, 2010).

Increasing caloric consumption may not be the most effective means of improving nutrition, especially when micronutrient deficiencies cannot be addressed with certain foods. Cash transfers tend to result in more diverse diets, allowing households to incorporate nutritionally rich foods, such as animal-sourced foods and fruit and vegetables into their diets. For example, animal-sourced foods have been found to not only improve nutritional outcomes but also to improve cognitive development

7 The section on Class III FAPs draws on Upton and Lentz (2012).
8 Not all distributed food assistance is consumed as food. Researchers have found that households or individuals may sell food aid, not because they do not need the food, but because the need for other household items (e.g., soap or matches) is more pressing (Reed and Habicht, 1998).
Compared to in-kind food distributions, vouchers have also been linked to increased dietary diversity (Meyer, 2007). In-kind food and commodity-denominated vouchers allow for agencies to target for specific nutrition interventions, such as distribution of vitamin-fortified vegetable oil or micronutrient powders. Studies comparing how households use US food stamp vouchers and cash distributions of similar value have found that vouchers, which are redeemable only for food, result in two to ten times more nutrient availability for households compared to cash (see Barrett, 2002 for a review). Barrett (2002) points out that one would expect that for poor households in poor countries, who spend proportionally much more of their income on food than U.S. residents, the ratios are likely lower.

The vast majority of available studies examine the short-term effects of nutritional and consumption-based interventions on nutrition outcomes. Del Ninno and Dorosh (2003), Adams and Winahyu (2006) and Sharma (2006) report that households receiving cash transfers consumed foods with higher kilocaloric values compared to those receiving in-kind assistance. FAPs have been documented to lead to increased child weight-for-height in Ethiopia and height-for-age in Ethiopia and Malawi (Quisumbing, 2003; Yamano et al., 2005; Sharma, 2005 as cited by Gentilini, 2007). In one of the few studies of the short-term impacts of food aid on adult nutrition, Broussard (2012) finds that men in households receiving free distributions of food aid in rural Ethiopia have higher body mass indices (BMIs). Adult women in low asset households receiving free distributions of food aid do not have higher BMIs while women who enjoy more bargaining power are more likely to benefit from food aid. Reviewing the outcomes of SNAP on health, Meyerhoefer and Yang (2011) report that SNAP recipients consistently spend more on food than do non-participants with equivalent post-transfer incomes but whether SNAP participation impacts nutrient intake remains inconclusive. SNAP participation is positively associated with obesity for women, although not for men and evidence is mixed for children (Meyerhoefer and Yang, 2011; See also Landers, 2007).

A few longer-term studies find important relationships between nutrition and income, and nutrition and health particularly for those who young children during the intervention. Using longitudinal data from Brazil, Thomas and Strauss (1997) estimate that each one percent increase in height is associated with earnings increase of 2.4 percent. Hoddinott et al. (2008) finds that men in Guatemala who, when they were between zero and three years old, received a supplementary food rich in micronutrients earned statistically significantly higher hourly wages (46 percent higher) compared to men who received a less nutritious supplementary food. Using the same data from Guatemala, Behrman
et al. (2009) find that girls who received the more nutritious supplementary food had offspring with higher birthweights, were taller, and achieved better height-for-age and weight-for-age scores compared to the offspring of women who received a less nutritious supplementary food in childhood.

Very few program evaluations identify both nutritional impacts and cost effectiveness. Behrman and Hoddinott (2005) found that children participating in Oportunidades gained, on average, about one centimeter more than children not participating in Oportunidades. However, Rivera et al. (2004), comparing outcomes for children (ages 0-12 months) eligible for Oportunidades for two years to children eligible for Oportunidades for one year, find that among children eligible for two years, only those children living in below-median socioeconomic status households grew significantly more (1.1 centimeters) than children eligible for one year.

Rivera et al.’s (2004) finding from Oportunidades suggests that for cash constrained households (those with lower socioeconomic status), receiving cash translated into improved nutritional status. Similarly, Leroy et al. (2009) find that there is a threshold beyond which additional cash does not result in improved nutrition. These two findings indicate that targeting poorer households with transfers may improve nutritional outcomes of CCTs. The findings also highlight the complementary role that nutrition education can play (Bryce et al., 2008).

Cost effectiveness

Available evidence indicates that cash tends to be less expensive than vouchers, which are less expensive than in-kind transfers (Gentilini, 2007; Meyer, 2007; Upton and Lentz, 2012). Unfortunately, this generalization is based on few side-by-side comparisons. In one study of different government transfer programs in Bangladesh, Ahmed et al. (2009) found that the cost of delivering food was 20 percent of the value of the food Taka while the cost of delivering the same value in cash was less than two percent. In Ethiopia, cash transfers were found to be 39 to 46 percent less costly than equivalent transoceanic shipments and were 6 to 7 percent less costly than local procurement (Adams and Kebede, 2005). However, inflation can undercut cost savings in cash programs (Harvey and Marongwe, 2006). Vouchers generally have slightly higher administrative costs than cash, but may have lower monitoring and evaluation costs because it is possible to interview vendors about voucher use rather than interviewing many households (Meyer, 2007; Lor-Mehdiabadi and Adams, 2008). Nonetheless, two important caveats are that administration costs and delivery costs are highly variable, especially for cash and vouchers (Harvey, 2005; Gentilini, 2007) and that the above cost findings by transfer type should
not be considered universally true because in certain contexts certain transfers may be more or less appropriate (Barrett et al., 2009).

The cost efficiency of transoceanic deliveries of in-kind transfers compared to locally and regionally procured in-kind transfers appears to differ based on the commodity type and the local context. Disaggregating food aid by commodity type (grains, pulses, and higher value products), Lentz et al. (forthcoming) find that grains and most pulses tend to be substantially cheaper to procure locally than grains and pulses delivered as US food aid. The cost differential likely reflects that bulkier products cost more to ship relative to underlying commodity value, especially from the US, where US Cargo Preference law requires the use of the generally more expensive US-flagged shippers (Bageant et al., 2010). However, for higher value products, such as vegetable oil and CSB, shipping from the U.S. can be more cost efficient, although this varies (Lentz et al., 2012). In countries with relatively well-developed production facilities, such as Kenya, procuring vegetable oil and CSB locally can be more cost efficient than US food aid shipments.

Finally, improving the quality of in-kind food aid comes with additional costs, although the costs are likely outweighed by the expected nutritional gains. Webb et al. (2011) estimate the cost of improving the quality of food aid rations for a mixture of nine emergency and development food aid projects at 6.6 percent of current costs, on average. The specific improvements to food aid quality included fortification and milling of grains rather than delivery of whole grains, improvements to CSB and wheat soy blend, and delivery of appropriate levels of vegetable oil (to be blended with fortified blended foods). However, where programs delivered CSB as payment or incentives, the authors replaced CSB with a lower cost fortified product, which contributed to the relatively low cost increase (Webb et al., 2011).

**Class IV: Adults with special nutritional needs**

Carter and Barrett (2006) differentiate between intrinsically poor individuals and unnecessarily poor individuals. The latter category includes individuals and households who need safety nets or SP programs to assist them to escape poverty or to recover from a shock (we designate this category as Class III). Intrinsically poor individuals, in contrast, need external support in order to meet their basic needs and are unlikely to gain economic independence. Elderly individuals, households with HIV positive members, disabled individuals and others facing chronic illnesses are less likely to be able to work for income and therefore are at higher risk of being intrinsically poor. The ability of intrinsically poor
individuals to rely on FAPs and to access long-term external assistance has been described as “positive dependency” (Lentz et al., 2005).

**Nutritional effectiveness**

Ivers et al. (2009) write “food insecurity ... undernutrition ... and HIV/AIDS overlap and have additive effects” (p. 1096). Failing to address malnutrition as an HIV infection progresses can lead to worsening malnutrition; HIV disrupts metabolic functioning, compromising an individual’s ability to utilize micronutrients. In turn, food improves the absorption and effectiveness of drugs. Therefore undernutrition can undermine antiretroviral therapeutic (ART) treatment for HIV. HIV-positive individuals also have different nutritional needs than the noninfected population (Ivers et al. 2009). Food assistance can provide an important support to the health of HIV-positive individuals and may delay or prevent the progression of HIV. However, there is no consensus yet on what foods can best support the health and nutrition of HIV-infected individuals, although RUTFs are increasingly used in HIV programs (Ivers et al., 2009). Similarly, Webb et al. (2011) note that “advances in programming of nutritional support to ART activities remain limited” (p. 30) and they recommend that the US government should develop guidance on nutritional support for people affected by HIV/AIDS.

**Cost effectiveness**

There is little evidence on the cost effectiveness of FAPs targeting adults with special needs. Most such interventions are motivated on humanitarian grounds, which may help explain the paucity of evidence.

3. **Factors contributing to effectiveness and evidence on effectiveness**

The performance of FAPs depends on a host of factors related to context, the objectives of the FAP and program design (Bryce et al., 2008; Pinstrip-Andersen and Herforth, 2008; Barrett and Lentz, 2010). Often, tradeoffs exist. Which intervention is likely most appropriate will depend on the primary objective and the environmental, market, and political context (Barrett, 2010; Upton and Lentz, 2012). In a review of 54 cash transfer interventions, Bailey and Hedlund (2012, pp.19) write “making blanket statements about the cost efficiency and cost-effectiveness of cash assistance in meeting nutrition objectives is impossible because these calculations are specific to individual contexts.” Among the studies Bailey and Hedlund (2012) reviewed, the type of nutrition indicators varied from food consumption measures to dietary diversity measures to anthropometric measures. Thus, comparing
across cash transfer projects with nutritional objectives is as difficult as comparing across projects using different transfer types.

Upton and Lentz (2012) review evidence on the ability of different food assistance tools intended to address food insecurity, including cash, vouchers, transoceanic food aid and LRP food aid, to meet various objectives such as cost efficiency, timeliness of delivery, increased consumption, and ensuring food safety and quality standards are met. The authors write, “No single tool can meet all objectives in all contexts, and when trying to meet multiple objectives, trade-offs will be unavoidable. Needs can often best be met by employing a combination or sequence of different approaches. The crucial question is not which tool is always optimal, but which tool or sequence of tools is appropriate to a given set of objectives, context, place, and time” (Upton and Lentz, 2012, p. 77). This finding is consistent with the Tinbergen principle of one policy tool for one policy outcome (Barrett, 2002). An implication is that analysts should seek the food assistance intervention that can best meet the primary objective(s) rather than seeking an (elusive) intervention to achieve all objectives equally well. Further, implementing agencies’ capabilities and capacities shape outcomes. In this section we review how FAP effectiveness in achieving any of several objectives varies with a range of key factors.

Targeting

Better targeting may be the most cost effective improvement to FAPs for food insecure recipients (Lentz and Barrett, 2007). Hence the considerable effort most programs undertake to target the needy. There are numerous approaches to targeting households and individuals including means testing, geographic targeting, community-based targeting, demographic targeting, self-targeting, and proxy means testing. A combination of approaches is often most effective (Coady et al., 2004). Coady et al. (2004) report that the median program in their review of targeting practices provided roughly 25 percent more resources to poor individuals than would random allocations. Yet, targeting is difficult;, both exclusion and inclusion errors are commonplace in all FAPs. However, improved targeting accuracy often results in increased costs (Basu, 1996). Thus, there is a tradeoff between accuracy of targeting and cost of identifying the subpopulation of interest.

Much of the interest in targeting has focused on whether female recipients will use transfers differently from male recipients and thus whether gender should be a targeting criterion. Attanasio et al.’s (2009) findings from Colombia suggest that CCTs targeted to women may crowd in food consumption, particularly if CCTs improve bargaining power of those in charge of food consumption
decisions. Barber and Gertler (2010) argue that a benefit of Oportunidades is that women receiving the transfers felt more entitled to health care services and accessed more care for their children.

Yet, food aid receipt (or receipt of other transfers) alone may not be enough to “empower” women or increase their household bargaining power, particularly among extremely poor households. Findings from Bangladesh indicate that whether a woman is a household head or not appears relevant for determining whether a woman prefers cash or food transfers. Walsh (1998) concludes that women who are household heads may be more able to spend cash on items they need compared to women who are not household heads and may not be able to control how a cash transfer is used. Therefore, while targeting tends to focus on whether to provide transfers to males or females, providing transfers to women does not necessarily guarantee that women will decide how to use them.

Nutrition-sensitive programming may lend itself to specific targeting approaches, for example, cohort targeting to women of child-bearing age. Almond and Currie (2011, p. 168) argue that if the fetal origins hypothesis stands, “one can best help children (throughout their life course) by helping their mothers. That is, we should be focusing on pregnant women or perhaps even women of child-bearing age … That said, the existing evidence is not sufficient to allow us to rank the cost-effectiveness of interventions targeted at women against more traditional interventions targeted at children, adolescents or adults.” Nonetheless, targeting specific members of a household does not mean that the assistance is entirely additional for that member or that incentives within the household are aligned with program objectives.

**Additionality**

One concern about food assistance projects is whether they have adverse effects on local insurance networks by “crowding out” community-based assistance (Dercon and Krishnan, 2003). As a result, FAPs may not be fully additive resources for recipients. However, crowding out may not indicate an erosion of private transfers. Rather, FAPs may protect private transfers by keeping them in reserve for when broader assistance programs are unavailable. Moreover, findings of crowding out appear to be context-dependent. Lentz and Barrett (2005) do not find any significant effect of food aid on remittances received in northern Kenya and southern Ethiopia. Gilligan et al. (2009) likewise find that private transfers to participants in Ethiopia’s Productive Safety Nets Programme (PSNP) are not affected by PSNP transfers. In contrast, providing conditional cash transfers to women in the Colombian program
Familias en Accion appears to crowd in household food consumption by 13 to 15 percent, perhaps by changing intrahousehold bargaining power (Attanasio et al., 2009).

**Timeliness**

Delayed interventions can result in lost lives, health, and assets and can cause other adverse side effects. Delayed interventions are also much more costly compared to intervening before conditions deteriorate to devastating levels. Individuals may choose to forgo food in order to protect productive assets (Hoddinott, 2006). This can be particularly devastating for small children, who may not be able to catch up after a period of undernourishment. Further, beyond a critical threshold, households without other options may engage in adverse coping strategies, such as eating seed or selling livestock, in order to meet basic needs. This renders them more at-risk for future food insecurity. Finally, delaying responses costs agencies and governments more. Barrett (2010, p. 826) points out “In Niger, quite apart from the still unclear human health toll and lives lost to delays, the cost per beneficiary for World Food Programme deliveries more than tripled from February to August 2005, from $7 to $23, due to far greater need for supplemental and therapeutic foods instead of cheaper, bulk commodities, and the need for airlift and other quicker, but more expensive, logistical support.” Lastly, mis-timed deliveries of food assistance, when households do not need or need it less are less effective and can adversely impact local markets (Barrett et al., 2009).

The transfer form of a FAP can dramatically affect the timeliness of response. On average, cash and voucher-based FAPs reach recipients faster than does local procurement, which is faster than transoceanic food aid (Upton and Lentz, 2012). Lentz et al. (2012) find that procuring food aid locally saved an average of fourteen weeks relative to transoceanic food aid matched by country and time period.

The duration of the intervention can also increase nutritional gains through both increased exposure to the intervention and also through learning effects (Galasso et al., 2011). Galasso et al (2011) find that an additional year of exposure to a Malagasy community nutrition program resulted in a statistically significant decrease in malnutrition for 0-6 month olds and 7-12 months. Further improvements were seen for programs implemented for two years. Secondary benefits of longer duration projects and programs include that they provide agencies an opportunity to learn how to more effectively administer the program and recipients and communities can internalize new practices.

**Seasonality**
Those facing periodic or seasonal food insecurity are not only rural populations in developing countries but include other populations, such as impoverished, school aged children in western countries during summer breaks. Seasonal hunger is particularly a problem for rural populations in the period leading up to harvest season and for seasonal workers (Devereux et al., 2008). FAPs that reliably reach people during periodic hunger can keep people from undertaking adverse coping strategies that can lead to worsening nutrition and further impoverishment. Nord and Romig (2007) find that within the US, food insecurity for families with children eligible for school lunches under the NSLP worsens in summer in states with smaller numbers of Summer Food Service Program (SFSP) meals and summer school lunches than students in states providing more SFSP meals.

Incentive effects

USGAO (2011) reports that while targeting higher-nutrient foods to desired populations, such as small children, may be cost effective, “targeting can be undermined at the recipient level by the cultural practice of sharing in local communities” (p. 26). In a survey of 30 programs, they found 26 programs reported some sharing. Thus, targeting specialized nutritional products can be difficult and may not be as cost effective as some estimates indicate. Webb et al. (2011) believe that smaller packaging of high-nutrient content foods may discourage sharing. Blanket supplementary feeding or distribution of family rations allows for some sharing while reaching the individuals most at need.

One common concern is that FAP transfers, by acting as income sources, will discourage people from working or pursuing livelihoods. There is relatively little evidence of this (Lentz et al., 2005). Examining US assistance programs, Moffitt (2002) reports that the US Food Stamp Program had little effect on labor supply. Hoynes and Schazenbach (2012), find that during the later 1960s and early 1970s, among female single-headed households food stamp participation reduced employment by 25 percent. Abdulai et al. (2005) found that food aid distributions in Ethiopia are not associated with any decline in food production. Based on these findings, the authors argue, “observers should be cautious about uncritical acceptance of claims that food aid has disincentive and dependency effects” (Abdulai et al., 2005, p. 1701).

A second common concern is that FAP eligibility requirements based on anthropomorphic measures may encourage caregivers to deny food to a child, in order to increase the likelihood of their eligibility. In an evaluation of a fresh food voucher program in the Dadaab refugee camps in Kenya, Dunn (2009) reports that while there were rumors of caregivers withholding food from children, the rumors
were unfounded. While such anecdotes abound, hard evidence of strategic withholding of food from targeted individuals remains rare.

**Social acceptability**

Under some programs, many eligible individuals do not receive benefits. Landers (2007) reports that in the US only one-third of the eligible elderly population receive food stamps and that in 2005, 35 percent of all eligible individuals did not receive food stamps. Common reasons given for not participating included people not knowing they could were eligible, not feeling they needed the benefit, not satisfied with the amount they would receive, feeling that the application process was complex and feeling that receiving food stamps would be stigmatizing (Landers, 2007). Particular delivery mechanisms can decrease stigma associated with receiving FAPs, such as cash or distinctively labeled debit cards, compared to vouchers. However, some agencies that use self-targeting to identify food insecure individuals may want to use long waiting lines, distribution of less-desirable foods, or other potentially stigmatizing actions in order to “encourage” only food insecure individuals who truly need assistance to use the program.

Nonetheless, self-targeting may not achieve the desired results. Food-for-work, for example, was commonly believed to be an effective form of self-targeting. When the FFW payment rate was below market wages it was expected that only the most needy households would supply workers. However, in a study of food-for-work projects in Ethiopia, Clay et al. (1999) found that households with a surplus of labor participated in FFW schemes, and that the most-needy households often did not have spare labor to participate while wealthier households did. Barrett and Clay (2003) demonstrate that adjustments to FFW wages lead to as much self-selection into or out of the program among the poor as among the better-off in rural Ethiopia.

In an evaluation of comparable populations receiving in-kind transoceanic food aid and receiving locally procured food aid, Violette et al. (forthcoming) find that recipients receiving local food were more satisfied, even in instances when preparing local food required more effort. This seems to reflect familiarity and comfort with local food varieties over imported foods, underscoring yet again the importance of local and national food systems, even within FAPs.

**4. Political economy considerations**
While the Copenhagen Consensus, Millennium Development Goals, and other activities have highlighted both the importance of improved nutrition and the costs associated with achieving nutritional goals, chronic and seasonal hunger has tended to be relatively low on the list of international priorities (Vaitla et al., 2009). For this, and other reasons, country-led strategies may be the most effective avenues to pursuing improved nutrition and food security. The SUN framework (2011), endorsed by over 100 partners, argues for country-owned nutrition programs and strategies, as does USAID’s Feed the Future Initiative. Ideally, countries’ ministries are best-suited to design contextually appropriate nutritionally sensitive food assistance programming rather than international strategies. However, country-led programs face political economy challenges.

When designing FAPs, policymakers and analysts have to trade off targeting accuracy for political support (Pinstrup-Andersen, 1993). Errors of inclusion, such as expensive bread subsidies that mainly support the middle class rather than the poor, may be the political price of ensuring support for any sort of program that will cover economically and politically marginalized populations most in need. These considerations are perhaps especially important in democratic states where governments rely on the support of voters, who are more likely to be urban and middle class than the rural poor.

Furthermore, FAPs designed for a particular context and moment in time can be difficult to change or end when circumstances evolve substantially. For example, the United States’ international food aid program, the world’s largest, was created in its modern form in 1954, in part as a means to dispose of government-held cereals and nonfat dried milk powder surpluses generated by federal farm price support programs. Those surpluses were shipped beyond the international marketshed into which American producers of the 1950s exported product. A government bureaucracy and political coalitions emerged around these programs. But when the United States government ended farm price support programs in the latter 1990s, thereby drying up government-held surpluses in need of disposal, the country’s international food aid programs retained largely the structure into which they were cast almost half a century earlier (Barrett and Maxwell, 2005). Bureaucratic and political inertia can make policy change difficult to effect, even when the evidence of inefficiency (or worse) under prevailing arrangements and the logic of change is compelling.

5. Conclusions: Some key principles
Despite the enormous sums spent on food assistance programs and policies over the years, there exists relatively little rigorous evidence comparing among interventions so as to establish what works best for which objective and, therefore, what should be the highest priority interventions given scarce resources. Moreover, there are relatively few studies that offer long-term results so as to establish long-run payoffs as well as those during a short period of program evaluation (Hoddinott et al., 2008; Behrman et al., 2009). Finally, it is difficult to do benefit-cost analysis effectively in the absence of clear counterfactuals and solid methods for controlling for non-random placement and selection effects. All of these serious caveats notwithstanding, there are a number of key messages that come through strongly.

1. Most food assistance policies/programs are local/national, not based on international food aid. Focus on getting domestic programs right first. Only secondly should policymakers focus on international programs. In fact, many international funders are increasingly relying on domestic production and or markets (e.g., LRP, cash and vouchers, supporting local processors of RUTFs).

2. FAPs increasingly and effectively rely on and work with commercial food marketing systems rather than establishing parallel delivery channels: EBT systems, cash/vouchers, LRP, etc. As cash-based transfers become more common, the line between FAPs and social protection programs blurs.

3. The returns on investments in FAPs are, on average, high but depend considerably on the targeting and cost structures as well as on food quality and role of complementary activities.

4. Returns are highest for the youngest recipients, especially in more remote regions where markets work least well. But, perhaps because the very young have little or no voice, FAPs oriented towards prenatal and early childhood interventions – Class I interventions in our typology – are less well funded and less popular than are interventions aimed at school-age children (Class II) or at the broader, largely adult population (Class III) even though these latter classes of interventions offer considerably lower average returns in economic, health, and nutrition terms as best as anyone can tell presently.

5. The political economy of food assistance policy tends to favor older, better off, urban populations. Recognize this and, if necessary, accommodate it if it is otherwise impossible to get programs in place for poor subpopulations at significant nutritional risk.

6. Timeliness is crucial. Especially for pregnant women and young children, rapid access to FAPs is crucial when independent access gets interrupted. This puts a premium on permanent, continuing programs that expand and contract with fluctuations in demand, rather than on programs that come and go episodically.
7. FAPs are a necessary and valuable last resort for poor and vulnerable individuals, households, and communities. Food security is typically advanced more durably and effectively by policy and program interventions that address more fundamental underlying issues of poverty and the functioning of the broader food system – local agricultural productivity, the efficiency of local commercial food distribution systems, etc.
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