



Cost/Benefit Hunger Impact Study

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INTRODUCTION

The tragedy of hunger often makes its way into media reports, political rhetoric and casual conversations over the dinner table, but it is mostly viewed as just that, a tragedy that affects someone else's family. The reality, however, is that hunger is not just an individual family's tragedy but a social phenomenon that imposes substantial monetary costs borne by all members of society. In fact, a growing body of scientific research has shown that hunger predisposes individuals to health problems and psychological and social dysfunction, increasing healthcare costs and lowering productivity in the labor force. In an effort to identify the true individual and societal costs of hunger in Minnesota, the University of Minnesota's Food Industry Center analyzed an extensive collection of existing hunger-related research. In the end, the University of Minnesota's Food Industry Center's

Cost/Benefit Hunger Impact Study not only isolates the cost of hunger in Minnesota, but it also estimates the possible financial return when we invest in securing food access for all Minnesotans.

METHODOLOGY

The Cost/Benefit Hunger Impact Study estimates a dollar value for the various "costs" associated with hunger as outlined in this study. In general there are two pieces of information needed in order to isolate costs associated with hunger. One is a scientific estimate of the impact of hunger on each adverse condition and the other is the cost associated with the condition. For example, knowledge of the effect of food insecurity on depression and knowledge about how much depression costs society would allow us to estimate the social costs that food insecurity imposes due to its effects on the share of Minnesota's population suffering from

depression. (Definitions and tables related to food security and food insecurity are attached as Appendix 1; a food security questionnaire is attached as Appendix 2.)

Estimating the effects of hunger on each adverse health condition needs to be calculated in such a way that we can be reasonably sure that the effect is due to hunger and not poverty in general or other household conditions that are common among households that experience food insecurity.

When attributing costs to the various adverse consequences of hunger, the primary task is to isolate those costs that can be considered independent of each other, so as to avoid double counting. For example, food insecurity is also associated with increased obesity (through worsening diets and inducing irregular eating patterns) and it has also been associated with diabetes. However, food insecurity could have an effect on diabetes through its effect on obesity. There would, therefore, be two ways of avoiding double counting of costs. Either find a cost estimate of obesity that excludes costs induced because of diabetes, or find an estimate of the effect of food insecurity on diabetes while holding obesity constant.

Throughout this study, we have had to make judgment calls on whether there is enough agreement in the scientific literature and whether the evidence is based on large enough samples with the use of appropriate statistical techniques so that the claimed effects of food insecurity on several conditions are credible. We also had to make judgment calls on what conditions can be considered

as independent of each other based on how the food insecurity effects and costs were computed. We therefore present two different estimates—one that applies sufficient skepticism and that is based only on conditions for which the evidence is plentiful and nearly irrefutable; and another more liberal estimate that includes conditions for which there is good evidence in the literature but around which there is still some debate as to the strength of the link to food insecurity verses other life circumstances.

KEY CONSEQUENCES OF HUNGER

Hunger leads to physical, psychological and cognitive effects that have consequences for adults and children in the United States.

HEALTH CARE AND EDUCATION CONSEQUENCES

According to a 2001 study by Alaimo et al.^a published in *Pediatrics*, hunger affects educational outcomes in children. In fact, a food insecure child is twice as likely to repeat a grade and three times as likely to be suspended. Moreover, math scores tend to be lower in hungry children. Along with other researchers,^b Alaimo et al. also found that children's emotional development can be affected by hunger.

Children who come from food insecure families are nearly twice as likely to see a psychologist and these children tend to have social and behavioral difficulties. Hunger can affect the mental health of both children and adults. Alaimo et al. found that teens that suffer from hunger are nearly twice as likely to suffer from depression and have thoughts of death. Likewise, a food insecure teen is five times more likely to commit suicide than a teen with sufficient food.

Many studies also document that adults are more likely to suffer from mental health problems if they are food insecure. For example, Whitaker and colleagues^c studied a sample of over 2,800 mothers and found that food insecure mothers are more likely to suffer from stress and anxiety even after holding constant income, socio-demographic characteristics, mental health history in family, history of domestic violence in their families as well as alcohol, drug and tobacco use. In fact, severely food insecure mothers were twice as likely as food secure mothers to have anxiety episodes. The study also found that food insecurity affects child psychological problems, directly and indirectly, through parental depression. These conditions contribute to multi-generational cycles of hunger, poverty and emotional issues.^d See Table 1 for a more complete summary of the increased odds of some of the consequence of food insecurity that we found documented in academic research.

TABLE 1. INCREASED ODDS OF NEGATIVE OUTCOMES FROM HUNGER

Condition	Times more likely if food insecure	Population affected
Poor Health	2.9	everyone
Migraine	1.95	everyone
Stomach Aches	2.61	everyone
Colds	1.33	everyone
Hospitalizations	1.3	everyone
Iron Deficiency	1.44	everyone
Obesity	2.45	women
Diabetes*	2.1	everyone
Depression	1.87	adults
Anxiety	2.14	adults
Underweight Births	1.81	newborns
Need to see a psychologist	2	children
Need of some kind of counseling	4	children
ADHD	1.9	children
Repeat a grade	2	children
School Suspension	3	children
Suicide	5	teens

**For severe food insecurity only.*

PHYSICAL HEALTH CONSEQUENCES

Food insecurity also leads to poor physical health. Food insecure individuals are more likely to experience colds, stomach aches, and migraines and suffer from generally poorer health than food secure individuals.^e Martin and Ferris^f studied the effects of food insecurity on body weight outcomes and found that adults are two and one-half times more likely to be obese, a condition that can cause a number of adverse health outcomes including diabetes, hypertension and cardiovascular disease. Seligman et al.^g observed that severely food insecure individuals are twice as likely to be diabetic. In fact, Nicholas and Tarasuk^h argue that food insecure adults are three times more likely to be hospitalized. Children often are the greatest victims of food insecurity. Alaimo et al.ⁱ found that infants and young children in food insecure homes often suffer from iron deficiency, affecting their cognitive and physical development. Moreover, food insecure pregnant women are at a higher risk of giving birth to an underweight baby or a baby with severe birth defects such as Spina Bifida. Food insecure children also suffer from higher rates of headaches, stomachaches, ear infections, and colds than do their well-nourished counterparts.^j

KEY COSTS OF HUNGER

All of the above-noted consequences not only affect the quality of life for individuals, but they come with associated health care and educational costs.

HEALTH COSTS

Our starting point is the condition of an individual's overall health. There is evidence that food insecure individuals report being

in poor overall health relative to food secure individuals. Data from the U.S. Department of Health and Human Services' Medical Expenditures Panel Survey shows that, on average, having poor health costs about \$10,000 in direct medical expenditures^k annually. We also have estimates of the effect of FI on overall health among children and adults. Therefore, we estimate that due to its effect on overall health, hunger costs Minnesotans almost \$1 billion (\$924,451,873) annually in direct medical expenses. Note that these are direct medical costs only, but the consequences of poor health also extend to missed work, lower productivity while working, and lower overall quality of life. These indirect costs are not factored into this cost so far.

Adding the costs incurred by health conditions that likely do not result in hospitalizations and have very few direct medical costs (and are thus not represented in the above figure), such as headaches/migraines, stomachaches and colds/flu, add another \$161 million annually. Additionally, several psychological and social consequences of depression and anxiety add another \$172 million for a total conservative cost of hunger of \$1.26 billion per year (\$1,257,875,068 in 2008 dollars). This is the conservative estimate of the direct and indirect costs of hunger in Minnesota due to poorer health. (For an explanation of how these numbers are calculated see Appendix 3.)

Food insecurity has also been shown to induce other negative consequences on individuals, such as underweight births, child mental disorders, heightened propensities to commit suicide and other isolating or anti-social behaviors (other than depression and anxiety).

In addition there is a greater need for more costly special educational programs. These conditions are not included in the conservative estimates above because they are often observed in conjunction with conditions that we have already considered. However, the costs induced by these consequences are likely not already accounted for in the conservative estimate above; we cannot be certain. For example, underweight births are thought to be correlated with mother's health and mental state; other mental disorders are often correlated with depression or anxiety, as are thoughts of suicide. Assignment to special education is also, in part, decided by considering a child's mental state.

If we add the costs associated with underweight births due to birth complications and incubation (\$6.5M) plus the costs of child counseling in relation to conditions other than depression and anxiety (\$51M) and the losses due to the tragedy of suicide (\$1.5M), the costs of hunger increase greatly. Data from the Minnesota Department of Education also allows us to estimate the costs of special education programs,^l which escalates the costs of hunger by another \$61.7 million (\$61,694,462), bringing the cost to about \$1.38 billion annually.

COSTS OF EDUCATIONAL DEFICIENCIES

Finally, food insecurity is also suspected of having a negative effect on educational outcomes of children. However, there is some discussion in the literature about the existence and size of these effects. Additionally, quantifying the costs of lower school performance is difficult because there is no literature that places values on absences,

class retention and/or test scores. We follow the methodology of Brown et al.^m in assigning values to educational losses. We use their estimates of the effect of food insecurity on absences and class retention and the effects of the latter on the propensity to drop out school prior to completing high school. We also use estimates from the literature on total lifetime wages lost (foregone) if one does not complete high school.ⁿ We included adjustments for the fact that the effect of food insecurity on school retention and the effects of retention and absences on dropping out are likely cumulative, multi-year processes rather than one-time events. The estimated loss due to poor educational performance adds \$238.2 million (\$238,226,279) annually to the direct and indirect costs of poor health. This brings the total bill to more than \$1.617 billion per year. See Table 2 for an overview of all health and education-related costs.

Note: Overall, we interpret our findings to mean that hunger's bill for the state of Minnesota in 2008 was at the very least \$1.32 billion. Our best (still conservative) estimate is \$1.62 billion. We caution, however, that the costs that we cannot account for (in addition to the \$1.62 billion) are likely sizable and would bring the total bill to much more. The above costs that we are able to account for amount to approximately \$800 per household each year.

TABLE 2. HUNGER-RELATED COSTS

Direct Health Costs	Item Cost (dollars)	Sub category Total
General Health --adults	641,620,163	
General Health --Children	282,831,710	
Total		\$924,451,873
Milder Health Conditions (Indirect)		
Stomach Aches	27,669,624	
Migraine	34,018,717	
Colds	99,503,441	
Total		\$161,191,783
Psychological Disorders		
Depression	56,989,643	
Anxiety	115,241,768	
Total		\$172,231,412
Total Conservative		\$1,257,875,068
Additional Consequences on Children and Teens		
Child Mental Disorders (need for counseling)	50,961,002	
Suicide	1,561,712	
Underweight Births (average births in a year)	6,481,149	
Special Education (school Costs)	61,694,462	
Total		\$120,698,326
Total (without education)		\$1,378,573,394
Education	238,226,279	
Total Less Conservative		\$1,616,799,673

POTENTIAL COST OMISSIONS

Included in the above analyses are the direct and indirect physical and mental health costs of hunger as well as the costs of special education and foregone wages due to low school performance. Left out are other indirect costs (losses), including a lower quality life. The medical literature has methods for estimating monetary losses due to changes in the quality of life based on how much people are willing to pay to engage in activities that different conditions inhibit. These omitted costs could be of similar magnitude. The likely tremendous indirect costs associated with underweight and premature births are also not accounted for here. A recent study by one of the authors of this report, Elton Mykerezzi et al^o estimated that underweight/premature births continue

to have adverse impacts on the school performance and psycho-social behaviors of children from the time they enter kindergarten until eighth grade. These effects were large and persist even after holding constant family and school conditions in eighth grade. Unfortunately, there is no reliable way to fully assess the lifetime consequences of premature/underweight births, but we suspect that they are very large relative to the medical costs accounted for here.

The literature suggests that chronic food insecurity may play a significant role in intergenerational hunger and poverty. This is because food insecurity lowers health and education. Both poor health (particularly mental health) and limited education are easily transmitted from generation to generation. For instance, in a Federal Reserve Bank of Chicago study, researchers Levine and Mazumder state that the consensus on the correlation between the parent's economic success and the child's is about 0.4^p. This implies that children born in households that suffer hardship are significantly less likely to have high earnings than children in well-off households. The primary channels responsible for this strong impact of parental wellbeing on the child's are education and health. However, we have omitted possible inter-generational effects because they are very difficult to quantify. Most studies considered here estimate the effect of food insecurity on child outcomes after holding parental education and health constant. But if food insecurity causes lower education and income among today's parents, its effects on the next generation will be twofold—the direct effect of food insecurity and the indirect effect that it would

have through lowering parental income and education.

BEARING THE COST

Using data on sources of payments for medical expenses from the Medical Expenditures Panel Survey^a we found that because those in poor health are likely to have low incomes and insufficient health coverage, about 70 percent of the difference in medical expenses between those in good health and those in poor health were paid by public programs such as Medicaid, and only 30 percent by private insurance or private funds. That is approximately \$6,550 per year in public costs for each individual in poor health. We also note that this is a national average, and we suspect the figure is higher in Minnesota. Applying the average tax rate for low-moderate income individuals to estimate the share of lost wages that translates to lost tax revenues, and accounting for other public costs (such as those of special education), we estimate that 46 percent of the total cost of hunger, \$746 million or almost three-quarters of a billion dollars (\$746,090,607), is paid by the public sector.

KEY COSTS AND BENEFITS OF PREVENTING HUNGER

Several programs and institutions designed to prevent hunger are in place, including federal and state food assistance programs. In this section we summarize costs as they are incurred by different stakeholders specifically regarding the Supplemental Nutrition Assistance Program (SNAP) and compute benefit/cost ratios for eliminating hunger for each of these stakeholders. Three pieces of information are used for this evaluation: costs

paid by each stakeholder; benefits accrued by each stakeholder; and an estimate of the effect that hunger-alleviating programs have on food insecurity.

SNAP COSTS

SNAP, formerly called The Food Stamp Program, is the largest of the nearly 15 food assistance programs managed by the Food and Nutrition Services at the U.S. Department of Agriculture. In 2009 the program served more than 37 million individuals at a total cost of over \$53.5 billion. This is a significant increase over the \$33 billion spent in 2007, and represents 68 percent of the spending on Federal food assistance programs.⁷

SNAP is an entitlement program in that the federal government pays for all food assistance expenditures, regardless of the sum, and it also pays for part of the administrative expenditures. The state of Minnesota supervises the administration of SNAP (which is called the Food Support Program in Minnesota), but the counties are the final administrators and decision makers on program administration. In terms of costs, as noted, the federal government pays for all assistance costs and part of the administrative and outreach costs while the state and counties pay for parts of the administrative costs associated with the program. In 2008 the Minnesota program cost \$295 million, of which \$256 million (87 percent) was federal funds. The state contributed \$346,000, and the counties contributed more than \$39 million. (For a discussion of what constitutes a cost as it relates to SNAP, see Appendix 4.)

SNAP IMPACT ON FOOD INSECURITY

In order to estimate the benefit/cost ratio of programs we also need to know the impact that program implementation has on food insecurity. This is a very difficult task because the scientific literature has to rely on observational rather than experimental data. In general, SNAP participants have higher rates of food insecurity than non-participants with similar incomes and demographic profiles. This, of course, does not mean that SNAP participation leads to a deterioration in food security. Instead, it means that those with high need/food insecurity, knowledge of SNAP, and an opportunity to participate in SNAP undergo the effort to enroll in the program, overcoming any stigma that might be associated with program participation.

To truly evaluate the impact of programs such as SNAP on food insecurity, one would need to disrupt program benefits to a randomly chosen group within the population of program participants and observe how the food insecurity of the excluded group compares to those who remain in the program. This is, of course, impossible due to ethical considerations.

However, George Borjas⁸ of Harvard has provided one reliable estimate of the effect of SNAP participation on food insecurity by studying a policy change that represents a natural experiment. After the welfare reform of 1996 (formally known as the Personal Responsibility and Work Opportunity Act or PRWORA), non-resident immigrants became categorically ineligible for federal food assistance. Some states opted to respond by making comparable state-level food assistance

available to shield immigrants and others did not. Borjas observed a 10-percentage point decline in the share of immigrants who received assistance because their state opted not to compensate them for the loss of federal assistance, which led to a five-percentage point increase in food insecurity. Out of the families that were excluded from the program, roughly 50 percent experienced significant deterioration in household food security. (For additional insight into how SNAP impacts food insecurity, see Appendix 4.)

SNAP COST/BENEFIT RATIO

In this report, we focus on estimating cost/benefit ratios that would be associated with large SNAP expansions but with the caution that this work should be used to obtain an overall idea of the kinds of returns that investment in ending hunger can produce rather than to motivate marginal policy changes. Clearly, specific proposed policy change must be evaluated carefully.

Consider a hypothetical world whereby ten percent of expenditures on federal food assistance stopped. The Borjas study indicates that, if that were the case, we could expect to see a five percent increase in food insecurity, which implies a five percent increase in its annual cost. This implies that every federal dollar spent in food assistance leads to \$2.13 in gains by our more conservative estimate and \$2.74 by the less conservative estimate because of the averted costs of hunger.

Economists, however, do not treat transfers as true costs. SNAP is reallocating funds from some members of society to others who are in a more dire need. This is really not a cost

to society but merely a transfer among its members. The true cost to society of SNAP, then, is only the administrative costs and dead weight losses due to taxation (definition of dead weight losses is included in Appendix 5). The true cost does not include the money transferred to individuals who use it to purchase food. We found in the literature that the estimates of the marginal costs of taxation vary somewhat, but, on average, 20 cents per dollar spent on food assistance programs is a reasonable “marginal cost of raising public funds.”^v That is, 20 cents out of a dollar is a true social cost. This implies that the true cost/benefit ratio to society overall is that for every \$1 spent (not transferred) on SNAP, between \$8 to \$11 is saved.

State governments, on the other hand, have large incentives to increase participation in federal food assistance programs. For instance, using Minnesota Food Support data, we estimate that for each \$1 the state government invests in managing federal assistance programs and on SNAP, another \$7.50 is contributed by the federal government. These dollars make their way into the hands of people and the overall economy. (For example, food insecure people who now receive these dollars buy more food, and the money is spent in local grocery stores. The grocery stores buy more food and hire more people, who, in turn, have more income to spend on food and other goods and services. This is called a multiplier effect, which represents an economic stimulus to the state as a whole.) The USDA has estimated that each federal assistance dollar (transferred or used for administrative costs) generates \$1.84 in economic activity due to multiplier effects.^w

So state investments in increasing SNAP participation can, in fact, inject millions of dollars into the state's economy. The economic benefit to the state is in addition to all the benefits that accrue as a result of avoiding hunger. In total, \$13.50 is generated in economic activity as a result of the \$7.50 in "new federal dollars." Note, however, that this is not a true social benefit, just a transfer of funds from the federal government. Additionally, as noted, each of these federal dollars invested in food assistance generates between \$2.13 and \$2.74 in savings due to the averted costs of hunger. So state policies that increase SNAP participation benefits not only avoid hunger in the state but also inject millions into the state's economy at a bare minimum of state expense. (See Appendix 6, Table 1 for a recap of the amounts of federal assistance that \$1 spent by the state in outreach and administration could bring.)

CONCLUSION

About one percent of Minnesotans (more than 52,000 people) are severely food insecure (hungry) and another 19 percent suffer from somewhat lesser levels of food insecurity. The costs of tolerating a hungry population include increased physical and mental health care costs, increased educational program costs, and foregone wages and economic productivity. These costs total \$1.3 to \$1.6 billion annually in Minnesota.

The cost/benefit ratios of reducing food insecurity among the Minnesota population per federal dollar spent to increase participation in SNAP range from \$2.13 to \$2.74. Looking at only the savings in the administrative costs of SNAP (not dollars transferred between members of society) yields a benefit cost ratio of between \$8 and \$11 per \$1 spent on increasing participation in SNAP. In addition to the averted costs of hunger, the state has additional incentives to improve SNAP participation because it injects new federal dollars into the state's economy. For each dollar the state spent on the program, the federal government contributed \$7.50.

Reducing hunger not only saves costs, it yields a return on investment. It is an achievable goal and one that will reduce human suffering for years to come.

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APPENDIX 1

MEASURING FOOD INSECURITY

Given the complex nature of food related hardships in industrialized societies, the Food Security Measurement Project, a collaboration among federal agencies, academic researchers and private, commercial and non-profit organizations, was launched to develop a measure that is appropriate for documenting all facets of the phenomenon. The measure was developed in response to the National Nutrition Monitoring and Related Research Act of 1990 (NNMRR).

The questionnaire that the government uses to measure hunger currently consists of 10 questions that refer to adult conditions and eight more that refer to conditions among children. (The food security questionnaire is attached as an Appendix 2.) Every year, this questionnaire is administered to the Current Populations Survey (CPS), to a sample of approximately 50,000 U.S. households. Based on individual answers to the food insecurity questionnaire, U.S. households are classified as having Full Food Security, Marginal Food Security, Low Food Security, or Very Low Food Security. (The latter category was named “food insecurity with hunger” prior to 2007.)¹ We use USDA’s instructions on how to interpret the answers to the Food Security Core Module in the Current Population Survey and USDA’s definitions of the categories of severity of food insecurity to estimate the food security status of Minnesotans in 2008. The figures imply that nearly 20 percent of the population answered at least one of the questions in the survey in the affirmative.

TABLE 1. FOOD SECURITY IN MINNESOTA: 2008

USDA DEFINITIONS

Category	Definition	# of questions affirmed	% in MN
High food security	No reported indications of food-access problems or limitations	None	80
Marginal food	One or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake	1 or 2	9
Low food security	Reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake	3 to 7	6
Security	and reduced food intake	8 to 10	5

Definitions from: <http://www.ers.usda.gov/Briefing/FoodSecurity/labels.htm>

To provide a better idea of how many households are facing certain specific problems, using the individual questions in the 2008 wave of the CPS, the authors of this report estimate that in a year's time, nearly 15 percent of all Minnesotans (783,000 individuals/three-quarters of a million people) report worrying that food would run out and they wouldn't have money for more. Also, 12.36 percent of all individuals report that they could not always afford balanced meals, eight percent reported eating less than they felt they should have, and seven percent had to cut the size of meals or skip meals altogether because they didn't have money to buy food. Fewer households also faced much more severe shortages with four percent of individuals having instances in which they were hungry and couldn't afford more food. One percent of individuals in Minnesota (more than 52,000 people) did not eat for one day or longer because they could not afford a meal.

REFERENCE

1 USDA: ERS: Briefing Room: Food Security in the United States: Definitions of Hunger and Food Security, <http://www.ers.usda.gov/Briefing/FoodSecurity/labels.htm>

APPENDIX 2

U.S. HOUSEHOLD FOOD SECURITY SURVEY MODULE: THREE-STAGE DESIGN, WITH SCREENERS

Economic Research Service, USDA

July 2008

Revision Notes: The food security questions are essentially unchanged from those in the original module first implemented in 1995 and described previously in this document.

JULY 2008:

- Wording of resource constraint in AD2 was corrected to, "...because there wasn't enough money for food" to be consistent with the intention of the September 2006 revision.
- Corrected errors in "Coding Responses" Section

SEPTEMBER 2006:

- Minor changes were introduced to standardize wording of the resource constraint in most questions to read, "...because there wasn't enough money for food."
- Question order was changed to group the child-referenced questions following the household- and adult-referenced questions. The Committee on National Statistics panel that reviewed the food security measurement methods in 2004-06 recommended this change to reduce cognitive burden on respondents. Conforming changes in screening specifications were also made.
NOTE: Question numbers were revised to reflect the new question order.
- Follow up questions to the food sufficiency question (HH1) that were included in earlier versions of the module have been omitted.
- User notes following the questionnaire have been revised to be consistent with current practice and with new labels for ranges of food security and food insecurity introduced by USDA in 2006.

TRANSITION INTO MODULE (administered to all households):

These next questions are about the food eaten in your household in the last 12 months, since (current month) of last year and whether you were able to afford the food you need.

OPTIONAL USDA FOOD SUFFICIENCY QUESTION/SCREENER: QUESTION HH1

(This question is optional. It is not used to calculate any of the food security scales. It may be used in conjunction with income as a preliminary screener to reduce respondent burden for high income households).

[IF ONE PERSON IN HOUSEHOLD, USE "I" IN PARENTHETICALS, OTHERWISE, USE "WE."]

HH1. Which of these statements best describes the food eaten in your household in the last 12 months: —enough of the kinds of food (I/we) want to eat; —enough, but not always the kinds of food (I/we) want; —sometimes not enough to eat; or, —often not enough to eat?

- [1] Enough of the kinds of food we want to eat
- [2] Enough but not always the kinds of food we want
- [3] Sometimes not enough to eat
- [4] Often not enough to eat
- [] DK or Refused

HOUSEHOLD STAGE 1: QUESTIONS HH2-HH4 (asked of all households; begin scale items).

[IF SINGLE ADULT IN HOUSEHOLD, USE "I," "MY," AND "YOU" IN PARENTHETICALS; OTHERWISE, USE "WE," "OUR," AND "YOUR HOUSEHOLD."]

HH2. Now I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).

The first statement is "(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more." Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?

- [] Often true
- [] Sometimes true
- [] Never true
- [] DK or Refused

HH3. "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- [] Often true
- [] Sometimes true
- [] Never true
- [] DK or Refused

HH4. "(I/we) couldn't afford to eat balanced meals." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- [] Often true
- [] Sometimes true
- [] Never true
- [] DK or Refused

SCREENER FOR STAGE 2 ADULT-REFERENCED QUESTIONS:

If affirmative response (i.e., “often true” or “sometimes true”) to one or more of Questions HH2-HH4, OR, response [3] or [4] to question HH1 (if administered), then continue to **Adult Stage 2**; otherwise, if children under age 18 are present in the household, skip to **Child Stage 1**, otherwise skip to **End of Food Security Module**.

NOTE: In a sample similar to that of the general U.S. population, about 20 percent of households (45 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 2.

ADULT STAGE 2: QUESTIONS AD1-AD4

(asked of households passing the screener for Stage 2 adult-referenced questions).

AD1. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn’t enough money for food?

- ☐ Yes
- ☐ No (Skip AD1a)
- ☐ DK (Skip AD1a)

AD1a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

- ☐ Almost every month
- ☐ Some months but not every month
- ☐ Only 1 or 2 months
- ☐ DK

AD2. In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food?

- ☐ Yes
- ☐ No
- ☐ DK

AD3. In the last 12 months, were you every hungry but didn’t eat because there wasn’t enough money for food?

- ☐ Yes
- ☐ No
- ☐ DK

AD4. In the last 12 months, did you lose weight because there wasn't enough money for food?

- ☐ Yes
- ☐ No
- ☐ DK

SCREENER FOR STAGE 3 ADULT-REFERENCED QUESTIONS:

If affirmative response to one or more of questions AD1 through AD4, then continue to **Adult Stage 3**; otherwise, if children under age 18 are present in the household, skip to **Child Stage 1**, otherwise skip to **End of Food Security Module**.

NOTE: In a sample similar to that of the general U.S. population, about 8 percent of households (20 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 3.

ADULT STAGE 3: QUESTIONS AD5-AD5A

(asked of households passing screener for Stage 3 adult-referenced questions).

AD5. In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?

- ☐ Yes
- ☐ No (Skip 12a)
- ☐ DK (Skip 12a)

AD5a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

- ☐ Almost every month
- ☐ Some months but not every month
- ☐ Only 1 or 2 months
- ☐ DK

CHILD STAGE 1: QUESTIONS CH1-CH3

(Transitions and questions CH1 and CH2 are administered to all households with children under age 18) Households with no child under age 18, skip to End of Food Security Module.

SELECT APPROPRIATE FILLS DEPENDING ON NUMBER OF ADULTS AND NUMBER OF CHILDREN IN THE HOUSEHOLD.

TRANSITION INTO CHILD-REFERENCED QUESTIONS:

Now I'm going to read you several statements that people have made about the food situation of their children. For these statements, please tell me whether the statement was OFTEN true, SOMETIMES true, or NEVER true in the last 12 months for (your child/children living in the household who are under 18 years old).

CH1. "(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the children) because (I was/we were) running out of money to buy food." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ DK or Refused

CH2. "(I/We) couldn't feed (my/our) child/the children) a balanced meal, because (I/we) couldn't afford that." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ DK or Refused

CH3. "(My/Our child was/The children were) not eating enough because (I/we) just couldn't afford enough food." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

- ☐ Often true
- ☐ Sometimes true
- ☐ Never true
- ☐ DK or Refused

SCREENER FOR STAGE 2 CHILD REFERENCED QUESTIONS:

If affirmative response (i.e., "often true" or "sometimes true") to one or more of questions CH1-CH3, then continue to **Child Stage 2**; otherwise skip to **End of Food Security Module**.

NOTE: In a sample similar to that of the general U.S. population, about 16 percent of households with children (35 percent of households with children with incomes less than 185 percent of poverty line) will pass this screen and continue to Child Stage 2.

CHILD STAGE 2: QUESTIONS CH4-CH7

(asked of households passing the screener for stage 2 child-referenced questions).

NOTE: In Current Population Survey Food Security Supplements, question CH6 precedes question CH5.

CH4. In the last 12 months, since (current month) of last year, did you ever cut the size of (your child's/any of the children's) meals because there wasn't enough money for food?

- ☐ Yes
- ☐ No
- ☐ DK

CH5. In the last 12 months, did (CHILD'S NAME/any of the children) ever skip meals because there wasn't enough money for food?

- ☐ Yes
- ☐ No (Skip CH5a)
- ☐ DK (Skip CH5a)

CH5a. [IF YES ABOVE ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

- ☐ Almost every month
- ☐ Some months but not every month
- ☐ Only 1 or 2 months
- ☐ DK

CH6. In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food?

- ☐ Yes
- ☐ No
- ☐ DK

CH7. In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food?

- ☐ Yes
- ☐ No
- ☐ DK

END OF FOOD SECURITY MODULE

USER NOTES

(1) CODING RESPONSES AND ASSESSING HOUSEHOLD FOOD SECURITY STATUS:

Following is a brief overview of how to code responses and assess household food security status based on various standard scales. For detailed information on these procedures, refer to the Guide to Measuring Household Food Security, Revised 2000, and Measuring Children's Food Security in U.S. Households, 1995-1999. Both publications are available through the ERS Food Security in the United States Briefing Room.

Responses of “yes,” “often,” “sometimes,” “almost every month,” and “some months but not every month” are coded as affirmative. The sum of affirmative responses to a specified set of items is referred to as the household's raw score on the scale comprising those items.

- Questions HH2 through CH7 comprise the U.S. Household Food Security Scale (questions HH2 through AD5a for households with no child present). Specification of food security status depends on raw score and whether there are children in the household (i.e., whether responses to child-referenced questions are included in the raw score).
 - For households with one or more children:
 - Raw score zero—High food security
 - Raw score 1-2—Marginal food security
 - Raw score 3-7—Low food security
 - Raw score 8-18—Very low food security
 - For households with no child present:
 - Raw score zero—High food security
 - Raw score 1-2—Marginal food security
 - Raw score 3-5—Low food security
 - Raw score 6-10—Very low food security

Households with high or marginal food security are classified as food secure. Those with low or very low food security are classified as food insecure.

- Questions HH2 through AD5a comprise the U.S. Adult Food Security Scale.
 - Raw score zero—High food security among adults
 - Raw score 1-2—Marginal food security among adults
 - Raw score 3-5—Low food security among adults
 - Raw score 6-10—Very low food security among adults
- Questions HH3 through AD3 comprise the six-item Short Module from which the Six-Item Food Security Scale can be calculated.
 - Raw score 0-1—High or marginal food security (raw score 1 may be considered marginal food security, but a large proportion of households that would be

measured as having marginal food security using the household or adult scale will have raw score zero on the six-item scale)

- Raw score 2-4—Low food security
 - Raw score 5-6—Very low food security
-
- Questions CH1 through CH7 comprise the U.S. Children’s Food Security Scale.
 - Raw score 0-1—High or marginal food security among children (raw score 1 may be considered marginal food security, but it is not certain that all households with raw score zero have high food security among children because the scale does not include an assessment of the anxiety component of food insecurity)
 - Raw score 2-4—Low food security among children
 - Raw score 5-8—Very low food security among children

(2) RESPONSE OPTIONS:

For interviewer-administered surveys, DK (“don’t know”) and “Refused” are blind responses—that is, they are not presented as response options, but marked if volunteered. For self-administered surveys, “don’t know” is presented as a response option.

(3) SCREENING:

The two levels of screening for adult-referenced questions and one level for child-referenced questions are provided for surveys in which it is considered important to reduce respondent burden. In pilot surveys intended to validate the module in a new cultural, linguistic, or survey context, screening should be avoided if possible and all questions should be administered to all respondents.

To further reduce burden for higher income respondents, a preliminary screener may be constructed using question HH1 along with a household income measure. Households with income above twice the poverty threshold, AND who respond <1> to question HH1 may be skipped to the end of the module and classified as food secure. Use of this preliminary screener reduces total burden in a survey with many higher-income households, and the cost, in terms of accuracy in identifying food-insecure households, is not great. However, research has shown that a small proportion of the higher income households screened out by this procedure will register food insecurity if administered the full module. If question HH1 is not needed for research purposes, a preferred strategy is to omit HH1 and administer Adult Stage 1 of the module to all households and Child Stage 1 of the module to all households with children.

(4) 30-DAY REFERENCE PERIOD:

The questionnaire items may be modified to a 30-day reference period by changing the “last 12-month” references to “last 30 days.” In this case, items AD1a, AD5a, and CH5a must be changed to read as follows:

D1a/AD5a/CH5a[IF YES ABOVE, ASK] In the last 30 days, how many days did this happen?

_____ days
[] DK

DEFINITIONS:

LEAST SEVERE:

Was this statement often, sometimes, or never true for you in the last 12 months? “We worried whether our food would run out before we got money to buy more.”

SOMEWHAT MORE SEVERE:

Was this statement often, sometimes, or never true for you in the last 12 months? “We couldn’t afford to eat balanced meals.”

MIDRANGE SEVERITY:

In the last 12 months, did you ever cut the size of your meals or skip meals because there wasn’t enough money for food?

MOST SEVERE:

In the last 12 months, did you ever not eat for a whole day because there wasn’t enough money for food? In the last 12 months, did any of the children ever not eat for a whole day because there wasn’t enough money for food?

APPENDIX 3

TECHNICAL METHODOLOGY

Annual Conditions:

Food insecurity imposes social costs because it increases the odds of several medical conditions, reduces overall health, increases the incidence of psycho-social problems, reduces educational performance and increases the odds of suicide. Of these conditions some impose annual costs, while others impose lifetime costs. For instance migraines impose similar costs each year, but the tragedy of suicide is a once-in-a lifetime event (though the value of life years lost and the productivity that would have accompanied that life could be calculated as an economic loss to survivors and society.) Poor educational performance also imposes life time costs lowering productivity throughout ones adult life. In this section we outline the methods used to compute the costs imposed through the medical and psychosocial conditions, those through education and the costs of suicide separately.

For each annual condition reported, we followed a series of steps to calculate the cost due to food insecurity.

1. Calculate the incremental risk of each condition if an individual lives in a food insecure home, relative to a food secure home.
2. Use the costs of each condition from the literature to calculate the cost burden that food insecurity imposes via each condition. This method is used for all medical costs, costs of psychological conditions and the costs of special education services.

Incremental Risk:

1. Calculate the incremental risk of each condition. Most literature on the consequences of food insecurity use binary response models (e.g. logistic regressions) to estimate the impact of food insecurity on the probability of several medical conditions. These models typically estimate adjusted odds ratios, which amount to a ratio of probabilities; that of suffering from the medical condition if one is food insecure to the odds of suffering from the same condition if they are food secure.

a. Start with these AORs from the literature on the consequences of food insecurity. For example, for migraines, the adjusted odds ratio is nearly 2. This indicates that a food insecure individual is twice as likely to suffer from migraines than a food secure individual. So if the average probability of a food secure person having chronic migraines is 10 percent, that of a food insecure would be 20 (a 10 percent chance increment). If instead the odds that a food secure person will suffer from chronic migraines were 20 percent more than a food insecure person, the food insecure person would have a 40 percent chance of migraines (or a 20 percent increment). So to translate odds ratios into probability increments we treat the actual prevalence of the condition as a weighted average of food secure and food insecure populations. Specifically, we use data on prevalence of food insecurity in the United States (and accompanying prevalence of food security) and the prevalence of each condition of interest. Studies that isolate odds ratios are done with nationally representative samples so we use U.S. prevalence rates to translate odds ratios into probability increments.

b. After identifying the prevalence of food insecurity (and security), the overall prevalence of the condition, and the AOR, we calculated the incremental risk of each condition given food insecurity. In other words, we calculated how food insecurity increases the risk of each condition suffered by an individual. To calculate the incremental risk, the following equation was used:

$$\text{Prevalence of Migraine} = (FS * P(\text{Migraine})|FS) + (FI * AOR * P(\text{Migraine})|FS) \quad (1)$$

where FS = food secure; FI = food insecure; P = probability; AOR = adjusted odds ratio

The Prevalence of Migraines nationally is equal to the share of the population that is food secure (FS) times the probability of migraines conditional on being food secure ($P(\text{Migraine})|FS$) plus the share of the population that is food insecure (FI) times the

probability of chronic migraines given food insecurity. Note however, that the probability of migraines given food insecurity is equal to the probability of migraines given food security times the adjusted odds ratio, (AOR* P(Migraine)|FS). Our variable of interest in this equation is P(Migraine)|FS which is the probability a food secure individual suffers from migraines, and that is the only part of that equation that we cannot obtain from data. (We can find the prevalence of migraines and of food insecurity in the nation from data, and the AOR from literature).

c. For the migraines calculation, we computed the probability of food secure individuals suffering from chronic migraines using 13.5% as prevalence of migraines in the U.S. population, 11.1% as prevalence for food insecure individuals, 88.9% as prevalence of food secure individuals in the U.S. population and 1.95 as the AOR for this condition.

d. Having found all the information in “c” from the literature, the only unknown in equation (1) is P(Migraine)|FS. Solving equation 1 for P(Migraine)|FS resulted in the probability of food secure individuals suffering from migraines equaling 12.2%.

e. Next, calculate the probability that a food insecure person suffers from the condition.

i. Multiply the probability that a food secure individual suffers from migraines by the AOR reported from the literature. For migraine, we multiplied our result, 12.2% by 1.95 and found the probability of migraines for food insecure is 23.8%.

ii. Finally, calculate the incremental risk of each condition given food insecurity. Subtract the probability food secure individuals suffer from each condition from the probability food insecure individuals suffer from each condition. For migraines, we subtracted 12.2% from 23.8% to find an incremental risk of 11.6%.

After calculating the incremental risk we calculated the cost of each condition attributable to food insecurity using cost estimates from the literature, adjusted to 2007 dollars. For this calculation, we identified the total population of the United States and Minnesota. We further identified the population of children and adults for each. This is because some conditions applied only to children while others applied only to adults. We also identified the cost estimates per year of each condition from the literature as well as the prevalence of each conditioned used in the first step. Finally, we identified the prevalence of food insecurity in Minnesota for all individuals, adults, and children.

After identifying this data from the literature, we continued our calculations. Our first step was calculating the total US population with each condition. We did this by multiplying the prevalence of each condition by the total US population:

*(Prevalence of Condition(%)*Total US Population) = Total Number of Individuals with Condition (2)*

For migraines, the prevalence of the condition is 13.5%. We multiplied this by the total population in the US (304,059,725). The total number of individuals suffer from migraines is 41,048,062.

Using this number and the cost estimate from the literature, we calculated the cost per person for each condition. This was done by dividing the total cost of each condition by the total number of individuals with the condition from (2):

(Total Cost of Condition/Total Number of Individuals with Condition) = Cost of Condition/Person (3)

For migraines, the total cost of the condition is \$18,012,711,000 per year. We divided this by the total number of individuals calculated above and found the cost per person to be \$438.82.

After calculating the cost per person of each condition, we applied this cost to individuals who suffer from this condition due to food insecurity in Minnesota. To do this, we multiplied the prevalence of food insecurity in Minnesota by the total population in Minnesota. For conditions pertaining only to children, we used the total child population in Minnesota as well as the prevalence of food insecurity among children:

*(%Food Insecure in Minnesota * Total Population of MN) = Total Number of Individuals Food Insecure (4)*

For each condition, the prevalence of food insecurity is 12.8% and the population of Minnesota is 5,220,394. The total number of Minnesotans who are food insecure is 668,210 according to this calculation.

From here we multiplied the total number of food insecure Minnesotans by the cost per person calculated in (3) and the incremental risk of each condition given food insecurity calculated in (1):

*(Total FI MN * Cost/Person * Incremental Risk) = Attributable Cost (5)*

To see the intuition behind equation 5, consider that Cost/person is the cost that a person suffering from the condition incurs in one year. This cost multiplied by the incremental risk induced by FI can be interpreted as the “expected value” of the cost that food insecurity induces through migraines per person. Finally multiplying this by the number of FI individuals produces the total cost expected to be incurred in one year.

This final calculation results in the attributable cost of each condition due to food insecurity. For migraines, we calculated 668,210 times the cost per person of \$438.82 times the incremental risk of 11.6% and found the total attributable cost of migraines given food insecurity to be \$34,013,995.

Education:

To calculate the attributable cost of dropping out of high school due to food insecurity, we used Larry Brown’s method from his paper “The Economic Costs of Domestic Hunger.”

As with the calculations from medical conditions, we first identified a number of statistics from the literature. We isolated the prevalence of food insecurity in the child population in Minnesota. We also found the prevalence of retention in the United States as well as the prevalence of absenteeism and dropping out.

To calculate the effects of food insecurity on education, it was necessary to identify the adjusted odds ratio for three factors that contribute to dropping out: the AOR for retention given food insecurity (as above, the AOR for retention given food insecurity in the literature is 1.44; this indicates that the a food insecure child has a 1.44 times greater chance of being retained in school than a food secure child); the AOR for absenteeism given food insecurity (1.6); and the AOR of dropping out given absenteeism (3.37). Because the effect of retention on dropping out was unreliable according to Brown's estimates, we used the average effect of the risk of retention from food insecurity throughout elementary and secondary education (7.3%). This method is explained in Alaimo (2001).

Using these numbers, we calculated the incremental risk given food insecurity for retention and absenteeism and the incremental risk of dropping out given absenteeism using the same method to calculate incremental risk as discussed above. As a result, we had four important statistics: the incremental risk of dropping out given absenteeism, the incremental risk of absenteeism given food insecurity, the incremental risk of retention given food insecurity, and the average effect of food insecurity on retention throughout elementary and secondary education. This final number was used instead of calculating the incremental risk of dropping out due to food insecurity.

Using these numbers, we calculated the increased risk of dropping out due to food insecurity. We calculated this using the following equation:

*Increased risk of dropping out due to FI = (Incremental risk of retention given FI*Average Effect of FI on Retention) + (Incremental risk of absenteeism given FI*Incremental risk of dropping out given absenteeism)(1)*

This calculation gives us the increased risk of dropping out due to food insecurity. The calculation also permits us to observe the effect of food insecurity on retention and on absenteeism which uniquely influence dropping out. We found a 5.3% increase in the risk of dropping out due to food insecurity.

From here, we obtained the number of Minnesota high school students (grades nine through twelve) from the Minnesota Department of Education. We recognize these students as at a higher risk of dropping out than children below the grade of nine.

The next step is to calculate how many Minnesota students will drop out due to retention and absenteeism given food insecurity. We do this by multiplying each incremental effect calculated in (1) by the total population of Minnesota high school students:

*Drop outs due to retention given FI = (Incremental risk of retention given FI*Average effect of FI on retention)*MN HS Students(2)*

Drop outs due to absenteeism given FI = (Incremental risk of absenteeism Incremental risk of dropping out given absenteeism)* MN HS Students(3)*

Following Brown's logic, we calculate the total increase in the number of high school drop outs

from Minnesota by adding (2) and (3):

Total number of drop outs due to FI in MN = Drop outs due to retention given FI + Drop outs due to absenteeism given FI(4)

To calculate the cost, we first obtain the lifetime cost of dropping out from the literature. This was consistently reported as \$260,000 per drop out student. From here, we multiply the total number of drop outs due to retention and absenteeism given food insecurity by the total lifetime cost of dropping out:

*Total cost of drop outs due to retention given FI = Drop outs due to retention given FI * \$260,000(5)*

*Total cost of drop outs due to absenteeism given FI = Drop outs due to absenteeism given FI * \$260,000(6)*

These numbers reveal the attributable cost of dropping out to retention and absenteeism given food insecurity. Adding together (5) and (6) gave use the final total cost of dropping out due to food insecurity.

Suicide:

Finally, we calculate the attributable cost of suicide as a result of food insecurity. To calculate this cost, we must incorporate the value of the life lost due to suicide. As above, before we calculate the cost we must identify a number of statistics from the literature. Because we categorize suicide as a teen phenomenon, we limit our US and Minnesota population to teenagers. We also identify the prevalence of suicide in the United States and the adjusted odds ratio that relates food insecurity to suicide. We then calculate the incremental risk of suicide given FI using the method identical to the previous methods.

From here, we identify the total cost of suicide that includes direct costs from the suicide per teen who commits suicide and indirect costs to recognize the lifetime costs of losing a life. These costs are reported in the literature as per person costs of teen suicide. We add these costs together in order to obtain the total cost of suicide per teen.

Using these numbers from the literature we continue to calculate the total attributable cost of suicide to food insecurity following the methods in the medical conditions section. Our first step is to calculate how many individuals in the US population commit suicide each year. We do this by multiplying the prevalence by the total teenage population of the US:

*Total Number of Teen Suicide = Prevalence of Suicide * Total US Population of Teens(1)*

Because we obtained the cost per person from the literature, we need not calculate cost per person as above. Instead, we follow the calculations above by identifying the total number of food insecure teens in Minnesota by multiplying the prevalence of food insecurity by the total populations of teens in Minnesota:

*Total number of food insecure teens = Prevalence of FI * Total MN Population of Teens(2)*

Using this number the total attributable cost of suicide to food insecurity is multiplied by the total number of food insecure teens in Minnesota by the cost per person in the literature and the incremental risk calculated above. The following formula shows this calculation:

*Attributable Cost to FI = Cost/Person * Incremental Risk * Total number of food insecure teens(3)*

APPENDIX 4

ADDITIONAL INSIGHT ON SNAP IMPACT ON FOOD INSECURITY

Another study by one of the authors of this report, Elton Mykerezi, in collaboration with Bradford Mills,^t found that SNAP participants who reported losing their benefits for at least one month due to a government rule change suffered a 10-percentage point increase in food insecurity relative to participants who are able to keep their benefits throughout the year or that exited the program voluntarily.

Why does this study differ from the Borjas study? The Borjas study observed what happens if an entire group of people (such as all immigrants) were to be excluded from the program regardless of their income and resources. Those excluded in the Mykerezi and Mills study were not the average participant but rather those who were the best-off among the participants (in terms of income and/or assets) and who became temporarily ineligible for the program. These households were likely the least needy of the participating households and had the smallest program benefits since the program allotment decreases as income increases. The Borjas effect describes what happens when “the average participant” is excluded from SNAP, while the Mykerezi and Mills study describes what happens when “the marginal participant” is excluded, the “marginal participant” being households that are borderline eligible.

Each effect can play a role in analyzing the effects of different policy interventions. For example, the American Recovery and Reinvestment Act (ARRA) in 2009 issued a nationwide waiver of all time limits and restrictions on the program participation of Able Bodied Adults with no Dependents (ABAWDs).¹ Prior to this change, ABAWDs were only allowed in the program for three out of any 36 months, and many had already used their quotas. This is a large, category-based change and it is likely to have an effect on food insecurity similar to that in the Borjas study, that is, a 50 percent reduction in the food insecurity of ABAWDs that are now eligible for the program. If, instead, SNAP expanded by implementing small increases in the asset limits or gross income limits for program eligibility, the newly admitted participants would resemble the borderline-eligible households in the Mykerezi and Mills study, and the policy would likely result in a 20 percent decline in the food insecurity of the newly eligible population.

So, we know that the return to an investment by different stakeholders in making programs more widely available will depend on the mechanics of how this is accomplished. For instance, from the state’s viewpoint, a marginal expansion would probably add the same administrative costs for managing each new caseload but would only result on a 20 percent decline in food insecurity among the newly admitted, so the returns to a marginal expansion may be substantially lower than those associated with a large categorical expansion. From the federal government’s viewpoint, the returns to both types of policies may be very similar as the food insecurity reduction of a marginal expansion is lower than that of a large expansion, but so are the costs that the federal government

will have to pay. This is because the marginal participants are likely to have higher incomes than the average participants and will, thus, receive lower payments.

REFERENCE

1. US Department of Agriculture, Food And Nutrition Service. Retrieved online on April 11, 2010. <http://www.fns.usda.gov/snap/rules/Memo/PRWORA/abawds/abawdspage.htm>

APPENDIX 5

DEFINING COSTS

What might be considered a cost depends on the point of view. For instance, from the viewpoint of the federal government, all of the federal expenditure on SNAP constitutes a fiscal cost. This is because the federal government has to make choices between how much to tax and how much to spend in providing several public goods and services and how much to increase the government debt. Additional spending on SNAP comes at a decrease in expenditures on other programs, higher taxes or higher debt. From the viewpoint of the State and county governments, only the portion of the total program cost that is paid with state/county funds constitutes a fiscal cost. Finally, what is much less understood is that from the viewpoint of society at large, what is to be considered a cost is significantly different. In general we care about the well being of all people in our society (current and future). Therefore, it is reasonable to define social well being as the sum of what each of its members has available for current consumption or savings (which translates into future consumption). Therefore a transfer of funds from one member of society to another does not constitute a social cost because it does not affect the sum of what all members of society have at their disposal. If transfer programs, such as SNAP, are financed with tax revenue we are transferring from some current members of society to others, while if it is financed by debt we are transferring from members of society that will live in the future to current members. Either way, the transfer itself is not a cost to society at large.

The true social costs of implementing such transfers come from two sources. The first is the cost of administering such a transfer. The resources that the government must dedicate to administer SNAP could be used for some other purpose in the absence of the program. The second source of true social cost comes from the fact that taxes divert economic behavior. This phenomenon is labeled as “the dead weight loss of taxation” by economists.¹ In this study we use estimates from scientific studies of the “indirect costs” of transfer programs (including administrative costs) and the dead weight losses in computing the benefit/cost ratios of transfer programs from society’s viewpoint.

REFERENCE

1. Consider the following example to best understand the idea of a dead weight loss. Suppose that a economic analyst is offered a consulting contract that pays \$7000 and it requires one month of his/her time. In the absence of taxes, the analyst may accept the offer and carry out the contract. But with the presence of taxes, he/she only gets a fraction of the \$7000, and may opt to take a vacation instead of accepting this contract. In this case, taxation led the individual to not produce and add \$7000 to the national GDP but to consume from current savings. The sum of all such possible diversions (productive work not done) in society constitutes the Dead Weight Loss of taxation.

APPENDIX 6

TABLE 1. STATE BENEFITS FROM INCREASED SNAP PARTICIPATION

(Benefit per \$1.00 spent by the state)

Row	Label		Dollar amount	Comment
1	State Investment:		1	
2	Federal Match		7.5	
3	Total Activity generated by federal match	7.5X1.8	13.5	Only the federal Dollars are considered new to the state and are multiplied by the 1.8 multiplier.
4	Conservative estimate of averted costs of hunger	7.5X2.13	16.0	Only the federal dollars go to food assistance, state dollars pay admin costs. So multiplying federal dollars with the FI costs averted by \$1 in assistance.
5	Liberal Estimate of averted costs of hunger	7.5X2.74	20.55	Same as in 4, but with the liberal estimate.
6	total conservative		29.5	Row 3+row 4
7	total less conservative		34.1	Row 3+row 5