

CURRENT AND PROSPECTIVE SCOPE OF
**HUNGER AND FOOD
SECURITY IN AMERICA:**

A REVIEW OF CURRENT RESEARCH



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Current and Prospective Scope of Hunger and Food Security in America: A Review of Current Research

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ACRONYMS

ADLs: Activities of daily living

CACFP: Child and Adult Care Food Program

CDC: Centers for Disease Control and Prevention

CHIP: Children’s Health Insurance Program

CPPW: Communities Putting Prevention to Work

CTC: Child Tax Credit

EITC: Earned Income Tax Credit

FFVP: Fresh Fruit and Vegetable Program

FPL: Federal Poverty Level

HFSS: U.S. Household Food Security Scale

NSLP: National School Lunch Program

OASI: Old-Age and Survivors Insurance

PHC: Pioneering Healthier Communities

SBP: School Breakfast Program

SES: Socioeconomic status

SFSP: Summer Food Service Program

SMP: Special Milk Program

SNAP: Supplemental Nutrition Assistance Program

SSI: Supplemental Security Income

SSDI: Social Security Disability Insurance

TANF: Temporary Assistance for Needy Families

TFP: Thrifty Food Plan

WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

GLOSSARY

Absenteeism: Regularly staying away from work or school.

Acculturation: Cultural modification that occurs by adapting the traits of another culture, for example, learning the language or adopting the diet of the new culture.

Activities of daily living (ADLs): Daily self-care activities within an individual's home, in outdoor environments, or both, that include the things we normally do, such as feeding ourselves, bathing, dressing, grooming, and working.

Behavioral economics: Behavioral economics combines the behavioral models of psychology with the decision models of economics to help highlight how biases in perception, memory, or thought processes may influence purchasing decisions. The approach can help identify the behavioral triggers that lead to the selection and consumption of healthier foods and healthier quantities of food.¹

Charitable food provider: Organizations that offer free food (e.g., groceries or hot meals) to those in need.

Child and Adult Care Food Program (CACFP): CACFP provides nutritious foods to children in day care, emergency shelters, and after-school care programs, and to adults in nonresidential adult day care centers, as well as family or group day care homes. CACFP aims to improve wellness, healthy growth, and development of young children, and the health and wellness of older adults and chronically impaired disabled persons.²

Child Nutrition Act of 1966: The Act aimed to meet more effectively the nutritional needs of our children, recognizing the demonstrated relationship between food and good nutrition and the capacity of children to develop and learn. This Act and successor legislation ultimately set up and further strengthened nutritional "safety net" programs.³

Child Tax Credit (CTC): The CTC is a federal tax credit for low and moderate income families with dependent children under age 17. The purpose of the CTC is to lower the tax burden of families who are raising children.⁴

Children's Health Insurance Program (CHIP): A federal program designed to cover uninsured children in families with incomes that are modest but too high to qualify for Medicaid.⁵

Communities Putting Prevention to Work (CPPW): Led by the Centers for Disease Control and Prevention (CDC), CPPW aims to help address the issue of rising rates of illness and death related to preventable chronic disease caused by obesity and tobacco use. The initiative strives to achieve this by helping communities to implement environmental changes to make healthy living easier, such as improving means for safe pedestrians and bicyclists, ensuring healthy food options in school, and limiting exposure to secondhand smoke, among others.⁶

Community-level barriers: Features (or lack thereof) of the community that may provide added challenges to accessing food including, for example, insufficient transportation infrastructure.

Confounding: Confounding variables are variables that the researcher failed to control, or eliminate, damaging the validity of the research. This can adversely affect the relation between the independent variable and dependent variable, and the results may show a false correlation between the variables or change the magnitude of associations.

Diffusion of innovation theory: A theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. The theory encompasses four main elements that influence

the spread of a new idea: the innovation, communication channels, time, and a social system. The process relies heavily on human capital: the innovation must be widely adopted in order to self-sustain.

Direct costs (on society): Directly measured expenditures that are incurred by society, such as costs for medical expenses for health and development conditions.

Earned Income Tax Credit (EITC): EITC (or EIC) is a benefit for working people who have low to moderate income. The tax credit helps working people keep more of what they earned.⁷

Economic hardships: Unfavorable economic circumstances, including unemployment and low socioeconomic status, which can result in a household's inability to pay expenses.

Educational attainment: The highest level of education an individual has completed.

Employment Security: The ensured possibility of continuing employment, even though it may not be in the same job.

Energy security: The ability to obtain energy needed to heat/cool a home and operate lighting, refrigeration, and appliances while maintaining expenditures for other necessities (e.g., rent, food, clothing, transportation, child care, medical care). Rising energy prices can negatively affect the food security status of a household.⁸

Extremely poor: Households at or below 50% of the Federal Poverty Level are defined as extremely poor.

Federal poverty level (FPL): The FPL refers to a set minimum income a family requires for basic needs (e.g., food, shelter, clothing). The Department of Health and Human Services establishes the FPL annually in order to provide thresholds for individuals to be eligible for safety net programs.

Food bank: The storehouse for food and other products that will go out to the community through the local food pantries. Food banks provide food to food pantries for distribution into their respective communities.

Food desert: Communities that have limited access to affordable and nutritious food.

Food expenditures: Food expenditures include the amount of money an individual or household spends on food.

Food insecurity: The USDA classifies households as being *food insecure* when the respondent reports 3 or more food insecure conditions on the HFSS. For households with children, reporting 2 or more food-insecure conditions for children means that the household includes food insecure children. The households that are classified as food insecure are divided into experiencing low food security or very low food security.

Food insufficiency: An inadequate amount of food intake due to a lack of money or resources.⁹

Food pantry: A food pantry provides food directly to the community and local residents who suffer from hunger and food insecurity.

Food security: Access by all people at all times to enough food for an active, healthy life.

Fresh Food Financing Initiative: A partnership with the Food Trust, this initiative worked to mitigate vendor risk through a financing program whose goal was to increase supermarket development in low income areas with limited food retail.¹⁰

Fresh Fruit and Vegetable Program (FFVP): The FFVP is a federally assisted program providing free fresh fruits and vegetables to students in participating elementary schools during the school day. The

goal of the FFVP is to improve children’s overall diet and create healthier eating habits to impact their present and future health.¹¹

Head Start Program: A federal program that provides comprehensive early childhood education, health, nutrition, and parent involvement services to low-income children and their families, with the goal of promoting school preparation.

Healthy Corner Store Initiative: Developed by The Food Trust, the Initiative aims to motivate youth and adults to purchase healthier items through classroom education and direct marketing in the corner stores. The multifaceted approach includes actions such as: increasing store capacity to sell and market healthy items; training and offering technical assistance to store owners to make healthy changes profitable; and linking corner store owners to community partners, local farmers and fresh food suppliers, among others.¹²

High food security: Households had no problems, or anxiety about, consistently accessing adequate food.¹³

Household food security: Access by all members at all times to enough food for an active, healthy life; at a minimum, nutritionally adequate and safe foods are readily available and can be acquired in socially acceptable ways (i.e., without stealing, accessing emergency food supplies, or relying on other coping strategies).

Housing security: Housing insecurity is high housing costs in proportion to income, poor housing quality, unstable neighborhoods, overcrowding, or homelessness.^{13, 14}(p.13). When housing security increases, food insecurity decreases (and vice versa).^{15, 16}

Human capital: The resources developed within people, including their capacity to learn and develop useful skills, produce, create, invent and communicate, and expand their knowledge, abilities and potential.¹⁷

Hunger: Defined as the uneasy or painful sensations caused by a lack of food, and occurs when food intake is reduced below normal levels. Hunger is both a motivation to seek food and an undesirable consequence of lack of food.¹³

Indirect costs (on society): Costs that are incurred by society through indirect consequences, such as a reduction in the workforce.

Informal coping strategies: Strategies outside of the social safety net and charitable food programs that are used to help an individual obtain or supplement food for themselves or their household, or to make existing food resources last longer; for example, performing odd jobs for extra cash, skipping meals, or diluting foods with water.

Innovation: Innovations are modifications or additions to approaches, processes, or interventions that respond to changing contextual circumstances or new information. Successful innovations typically have characteristics that enhance adoptability, such as a clear advantage over current practice and a low level of complexity.

Longitudinal study: A type of observational study, longitudinal studies are correlational research studies that involve repeated observations of the same variables over long periods of time—often several decades. They are often used to study developmental trends across the life span, or life events throughout lifetimes or generations. Longitudinal studies track the same people, and therefore the differences observed in those people are less likely to be the result of cultural differences across generations.

Low food security: Households reduced the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns were not substantially disrupted.¹³

Marginal food security: Households had problems at times, or anxiety about, accessing adequate food, but the quality, variety, and quantity of their food intake were not substantially reduced.¹³

Material hardship: Results from unfavorable economic circumstances for meeting basic household needs, such as food insecurity, housing insecurity, and energy insecurity, among others.

Medicaid: A social health care program for families and individuals with low income and resources.

Medicare: A national social insurance program that guarantees access to health insurance for Americans aged 65 and older who have worked and paid into the system, and younger people with disabilities.

National School Lunch Program (NSLP): Established to safeguard the health and well-being of the Nation's children, the NSLP is a federally assisted meal program operating in public and nonprofit private schools and residential child care institutions. It provides nutritionally balanced, low-cost or free lunches to children each school day.¹⁸

Old-Age and Survivors Insurance Trust Fund (OASI): Also known as Social Security, OASI is a federal program that provides income and health insurance to retired people, the disabled, the poor, and other groups.¹⁹

Pioneering Healthier Communities (PHC): An initiative of the YMCA's Activate America, PHC empowers communities with strategies and models for creating and sustaining positive change in support of healthy living. Communities involved in PHC have enhanced walkability and pedestrian safety, access to fresh fruits and vegetables, physical education requirements in schools, and workplace wellness efforts.²⁰

Presenteeism: Not being able to work effectively even when physically present at work or school.

Prospective study: Also called a cohort study, prospective studies follow over time a group of similar individuals (cohorts) who differ with respect to certain factors, to determine how these factors affect rates of an outcome. The distinguishing feature of a prospective cohort study is that none of the subjects have developed any of the outcomes of interest at the time of study enrollment.

Qualitative research: Qualitative research is aimed at gaining an in-depth understanding of human behavior and the reasoning and/or circumstances driving a given behavior. Qualitative research investigates the *why* and *how* of decision making, not just the *what*, *where*, and *when*.

Retrospective study: Also called a historic cohort study, retrospective studies typically study events that have already taken place, for example, by reviewing a patient's medical history.

Safety net programs: Also called transfers, or means tested benefit programs, the federal safety net, or social safety net, is made up of an array of entitlement programs administered by the federal and/or state governments (e.g., SNAP, WIC). The main goal of the programs is to provide aid to the poor or those vulnerable to shocks and poverty to prevent them from falling into further economic hardships.

School Breakfast Program (SBP): The program provides cash assistance to states to operate nonprofit breakfast programs in schools and residential childcare institutions.²¹

Social capital: The benefits and resources available to individuals through social networks or social groups, such as families, churches, or communities.

Social cognitive theory: This theory posits that portions of an individual's knowledge acquisition, and subsequent behavior modifications, can be directly related to observing others within the context of social interactions, experiences, and outside media influences.

Social network: A social structure made up of individuals and organizations, and the relationships and interactions between them.

Social Security Disability Insurance (SSDI): Social security pays disability benefits to household members who have worked long enough and have a medical condition that prevents them from working.²²

Socioeconomic status (SES): SES is an economic and sociological measure of an individual's or family's economic and social standing in relation to others, based on income, education, and occupation.

Soup kitchen: A place where prepared food, as opposed to groceries, is offered to the hungry. Soup kitchens are typically volunteer-run charities.

Special Milk Program (SMP): Provides milk to children in schools and childcare institutions who do not participate in other Federal meal service programs. The program reimburses schools for the milk they serve.²³

Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): WIC provides federal grants to states for supplemental, nutrient-rich foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and nonbreastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk. In most states participants also receive vouchers through WIC's Farmers' Market Nutrition Program.²⁴

Summer Food Service Program (SFSP): The SFSP was established to ensure that low-income children continue to receive nutritious meals when school is not in session. As a federally-funded, state-administered program, SFSP provides free, nutritious meals and snacks to help children in low-income areas get the nutrition they need throughout the summer months.²⁵

Supplemental Nutrition Assistance Program (SNAP): Formerly called the Food Stamp Program and also referred to as EBT (electronic benefits transfer), SNAP is a program that provides eligible families with funds to purchase food. SNAP's aims are to alleviate hunger and improve the nutrition and health of low-income people.²⁶

Supplemental Security Income (SSI): The SSI program pays benefits to disabled adults and children who have limited income and resources. SSI benefits also are payable to people 65 and older without disabilities who meet the financial limits.²⁷

Temporary Assistance for Needy Families (TANF): The TANF program is designed to help needy families achieve self-sufficiency. States receive block grants to design and operate programs that accomplish one of the purposes of the TANF program.²⁸

The Great Recession: Beginning in 2008, the US entered into an economic downturn, referred to as "The Great Recession", which was characterized by several household challenges, including increasing energy costs¹⁴ and food prices,²⁹ decreasing housing security,³⁰ and increasing unemployment.³¹

Theory of reasoned action or planned behavior: The theory of reasoned action suggests that a person's behavior is determined by their intention to perform the behavior and that this intention is a function of their attitude toward the behavior; as such, the best predictor of behavior is intention. The theory of planned behavior holds that only specific attitudes toward the behavior in question can be expected to predict that behavior.

Thrifty Food Plan (TFP): The TFP is used as the national standard for a market basket of foods which, if prepared and consumed at home, would provide a complete, nutritious diet at minimal cost. The TFP is used by SNAP to determine the amount of benefits given to families of varying sizes under the program.³²(p. 3)

Transtheoretical change model: The transtheoretical model of behavior change is a biopsychosocial model to conceptualize the process of intentional behavioral change. One of the key constructs of the model is the stages of behavioral change, which are: precontemplation; contemplation; preparation; action; and maintenance.

U.S. Household Food Security Scale (HFSS): The primary validated instrument for measuring food security and insecurity, administered annually by the U.S. Census Bureau through the Current Population Survey Food Security Supplement (CPS-FSS). Data from the HFSS are used by the USDA to monitor food security and insecurity.

Undocumented immigrant: An immigrant who lacks legal documentation to reside in the US and, as a result, may not qualify for certain public assistance programs.

Very low food security: At times during the year, eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money and other resources for food.¹³

Vulnerable populations: Include groups that, due to various circumstances, may not be fully integrated into the support systems that exist to help alleviate food insecurity, and include children, the elderly, minorities, and low-income households.

EXECUTIVE SUMMARY

In 2012, 15.898 million children in America (or 21.6 % of children) lived in food insecure households, and more than half of these children experienced food insecurity themselves.³³ Until 2007, food insecurity rates in the U.S. were relatively stable, between 15.6% and 17.6%, but the extent of food insecurity increased dramatically in 2008, from 15.8% to 21.0%.³⁴ Despite the end of the Great Recession in June 2009, the prevalence of food insecurity remained at an all-time high from 2009 to 2012, with the highest rates among households with children, households of persons with disabilities, and racial and ethnic minorities. Despite public, private, and community responses to food insecurity, these disturbing trends suggest that we lack a fundamental understanding of the landscape of factors that influence the rates of food insecurity, rates that ultimately have serious health and economic consequences on millions of Americans. In response to the magnitude and seriousness of the food insecurity problem in the U.S., an extensive food insecurity literature has emerged.³⁴ Understanding and awareness of food insecurity have come a long way in the last two decades, yet questions remain and, to a large degree, we have been unable to translate this extensive research into policy and program design.³⁵



This report on hunger and food security in America was prepared by RTI International in response to Section 743 of the Consolidated Appropriations Act, 2014 (P.L. 113-76). During the 11 week project, RTI conducted an extensive literature review and environmental scan of the research conducted on food insecurity from the Great Recession in 2008 to the present time (a detailed description of the methodology may be found in Appendix A). To avoid duplicating previous studies, the report is intentionally brief in its description of the research data on the scope of hunger and food insecurity in the US. Instead, the report seeks to advance the understanding of key determinants, consequences, and responses to food insecurity, establishing a framework that will drive the development of policy and programming recommendations. The duration of this project prevented us from conducting “deeper dives” into a number of areas of interest (e.g., physiological mechanisms connecting key determinants to health outcomes), areas that may require additional study to inform the dialogue on hunger and food insecurity. Nevertheless, we believe that this report will serve as a jumping off point for the National Commission on Hunger, and provide the President, Congress, and the public with a deeper understanding of the myriad risk factors that influence the food security of Americans. It should be noted that the recommendations provided in Section 5 are intended only to capture the major themes that emerged from this report. Over the next year and a half, the bipartisan National Commission on Hunger will be engaged in deliberations leading to the development of policy recommendations that reflect their diverse experience in hunger and food security, and draw on the results of additional studies and analyses that they direct RTI to perform.

The report begins with an **Introduction** that (1) establishes definitions for hunger, food security, and food insecurity, (2) presents a simplified framework that highlights major themes (e.g., household composition) discussed throughout the report, (3) describes how food insecurity is measured, (4) summarizes research on the current scope of food insecurity in America, and (5) offers some thoughts on the prospective scope of food insecurity in America given the paucity of research on the topic. Key findings presented in this section include:

- Food insecurity jumped sharply at the start of the Great Recession in 2008, and remains at historically high levels
- Starting in 2008, the prevalence of food insecurity increased quickly to 14.5% (17.6 million households) and has remained around that level through 2012, the most recent year with data available
- The most recent assessment of household food security (2012) shows that food security disproportionately affects vulnerable populations, including children, the elderly, minorities, and low-income households
- Twenty percent of U.S. households with children (7.8 million households) experienced food insecurity in 2012; in half of those households, only adults were considered food insecure because adults often shield children from food insecurity

- Food insecurity tends to be episodic; in 2012, a food insecure household was food insecure for an average of 7 months out of the year
- Households in certain geographic regions (e.g., the South) and environments (e.g., metropolitan areas) experience higher than average rates of food insecurity
- There is very little research on the prospective scope of hunger and food security in America; however, future perturbations of the system (e.g., climate change; economic downturns) may increase the household rates of food insecurity.

Section 2, **Key Determinants of Food Insecurity**, discusses the “risk factors” for food insecurity that fall into two major categories (1) individual and household characteristics (e.g., socioeconomic status, race and ethnicity, household composition, disability) and (2) contextual factors (e.g., geographic location, food and energy prices, unemployment rates). The section highlights a critical theme in food security research, namely, that food insecurity is a function of the complex interactions among and between multiple risk factors, and that the association between food insecurity and these factors is, at best, incompletely understood. Significant determinants of food insecurity presented in this section include

- Prevalence of food insecurity among households with children (20%) is higher than the national average (14.5%)
- Low socioeconomic (SES) predicts food insecurity, and income (a key component of SES) consistently correlates with household food insecurity, but does not predict it perfectly
- African American, American Indian, and Hispanic households experience food insecurity at higher rates than white, non-Hispanic households
- Economic hardships, including unemployment status and low SES, are key determinants of food insecurity among racial and ethnic minorities
- Prevalence of food insecurity among immigrant households is estimated to be nearly twice as high as the prevalence of food insecurity among nonimmigrant households in the United States
- Children in households headed by single women are disproportionately affected by food insecurity; approximately half of all households with food insecure children are headed by single women
- Households that include persons with disabilities experience higher rates of food insecurity; nearly one-third of food insecure households include a working-age adult with a disability

- The relationship between food security and health is often bidirectional—poor health is both an outcome and a risk factor for food insecurity
- Increasing energy and food prices have been shown to negatively affect the food security status of households, leading to poor child health outcomes and increased hospitalizations
- When neighborhood housing costs are high and exceed a significant portion of the household income, families have higher chances of experiencing food insecurity
- Experiencing prolonged unemployment and underemployment can contribute to a “financial cascade” which increases the number of food insecure households that rely on private and/or public food assistance programs.

Section 3, **Consequences of Food Insecurity**, summarizes research on outcomes that have been shown to be associated with food insecurity, including (1) health, development and education for children, (2) health of adults, (3) economic, (4) workforce, and (5) health care. In the popular media, food insecurity is frequently limited to discussions of child health which, although extremely important in both the near-term and long-term, represent only one dimension of the consequences of food insecurity. Thus, this section seeks to broaden awareness of the range and potential severity of the consequences of food insecurity. Some of the important consequences identified in this section include

- Studies have shown that poor maternal nutrition during food-insecure times can lead to a reduced intake of micronutrients, such as calcium, iron, and folate, which are important for fetal development
- Children in food-insecure households are more likely to experience risk of hospitalization, iron deficiency anemia, decreased bone mineral content in boys, and overall fair/poor health
- Children experiencing hunger in kindergarten had lower test scores in reading and math by third grade
- Once food-insecure children reach school age, studies have shown that they struggle with mental health issues, lower cognitive development, challenges with peer interactions, and lower grades
- Individuals that experience chronic food insecurity have higher prevalence of diabetes, increased inflammation, and cardiovascular disease and higher odds of being obese
- In part because of lower and inadequate nutrient intakes, food insecure older adults and seniors, especially those with poor health, can experience declines in health

- Shepard et al. estimated that “hunger costs our nation at least \$167.5 billion due to the combination of lost productivity per year, more expensive public education because of the rising costs of poor education outcomes, avoidable health care costs, and the cost of charity to keep families fed”
- Food insecurity can increase educational costs because food-insecure children are more likely to receive special educational services, nearly doubling the education costs relative to children without special needs
- Health conditions associated with food insecurity can translate into limited labor force participation and more absenteeism, presenteeism, and turnover—all of which are costly for the employer.

Section 4, **Responses to Food Insecurity**, describes programs and strategies that have been developed to provide assistance to the food insecure; these include (1) public assistance programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), (2) private assistance programs, commonly referred to as “emergency food providers” that represent, primarily, charitable organizations, and (3) the food environment as defined by the physical structures in the local community such as food stores, restaurants, schools, and worksites. The scope of this report precluded any sort of program evaluation and, therefore, the information presented in this section is intended to promote an understanding of what food “safety net” programs are available. To the extent allowed by published research, this section points out what has worked well, and what has not worked well using household food security status as an outcome. This section describes several innovative strategies developed through different programs, for example

- Innovative strategies used in the Supplemental Nutrition Assistance Program (SNAP) include expanding eligibility, increasing benefits, revising asset rules and performing outreach activities
- Innovative strategies used in child-focused programs include expanding eligibility in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), simplifying the application process for school meals, expanding eligibility for school meals, increasing availability of school breakfast, offering universal-free breakfast, and enhancing summer food benefits
- Innovative strategies used by private food providers include creating resource hubs to integrate services and placing food pantries in schools
- Innovative strategies used in the food environment include conducting community assessments, promoting community supported agriculture, locating supermarkets in low SES neighborhoods, and providing nutrition and financial management education.

Section 5, **Potential Strategies to Reduce and Prevent Food Insecurity**, presents potential approaches that can help households approaching the food insecurity threshold remain food secure, and enable those who have already crossed into food insecurity to escape. The section mirrors Section 4 to some degree, and describes approaches to strengthen (1) household economic security, (2) federal food and nutrition assistance programs, and (3) private food and nutrition assistance programs. As suggested above, RTI proposed these strategies based on major themes that emerged from the literature review and synthesis. Thus, these recommendations represent our understanding of what the current research suggests, rather than the comprehensive set of policy recommendations that the National Commission on Hunger will develop. Examples of potential strategies discussed in this section include

- Improve economic security by encouraging lower-middle income employment and increased wages, improving the affordability of housing and health insurance and developing financial incentives specifically targeted to low income residents
- Maintain and strengthen federal food and nutrition assistance programs, providing more stable resources for families trying to provide a better life for themselves
- Promote collaborations both among and within public and private service providers
- Incentivize charitable donations
- Support nutrition and financial management education.

1 INTRODUCTION TO HUNGER AND FOOD SECURITY

This report describes the body of research conducted from 2008 to the present on hunger and food security in America. During the 11 week project, RTI summarized and distilled the research in this area to produce a report describing the scope of the problem, key determinants, consequences, and responses. We distinguish what is meant by the terms "hunger", "food security", and "food insecurity", and focus on the measureable indicators of food insecurity that federal programs and policies are designed to address. Based on the research that we reviewed, RTI prepared a series of recommendations for potential approaches to reduce and prevent food insecurity in this country. This report is intended to (1) serve as jumping off point for the National Commission on Hunger, and (2) provide the President, Congress, and the public a deeper understanding of hunger and food insecurity in America.

This Introduction begins with a discussion of what is meant by hunger, food security, and food insecurity; for the purposes of this report, we used USDA's definition of household food security throughout the report. Next, the section talks about how food security is measured; this is particularly important because the research is framed by the definitions provided in this section. These initial sections set the stage for the summary of the current scope of hunger and food insecurity in America, where we present a very concise discussion of the current status, noting important time trends as well as trends by state. Key results of this summary include

- *Food insecurity jumped sharply at the start of the Great Recession in 2008, and remains at historically high levels*
- *Starting in 2008, the prevalence of food insecurity increased quickly to 14.5% (17.6 million households) and has remained around that level through 2012, the most recent year with data available*
- *The most recent assessment of household food security (2012) shows that food security disproportionately affects vulnerable populations, including children, the elderly, minorities, and low-income households*
- *Twenty percent of U.S. households with children (7.8 million households) experienced food insecurity in 2012; in half of those households, only adults were considered food insecure because adults often shield children from food insecurity*
- *Food insecurity tends to be episodic; in 2012, a food insecure household was food insecure for an average of 7 months out of the year*
- *Households in certain geographic regions (e.g., the South) and environments (e.g., metropolitan areas) experience higher than average rates of food insecurity.*

Lastly, a brief discussion of the prospective scope of hunger and food security in America is presented, acknowledging that there has been very little research conducted to date that could support a scientifically-based assessment of a future state.

1.1 WHAT IS FOOD SECURITY?

In this report, we use the USDA definitions of hunger, food security, and food insecurity. Currently, the USDA does not measure hunger—the physiological sensation arising from lack of enough food—because hunger is defined as an individual experience (which can come from food insecurity). Hunger also is a subjective experience that varies considerably by individual, and validated measures for hunger arising explicitly from food insecurity do not exist. In contrast, food security and insecurity capture household characteristics derived from social and economic conditions and are measured by observable behaviors relative to the availability of, and accessibility to, safe and nutritious food.¹³

The USDA established the definitions for food security and food insecurity in 2006 based on recommendations by an expert panel convened at the USDA's request by the Committee on National Statistics of the National Academies. Specifically, **food security** for a household means access by all members at all times to enough food for an active, healthy life. At a minimum, this includes

- The ready availability of nutritionally adequate and safe foods, and
- The assured ability to acquire acceptable foods in socially acceptable ways, that is, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies.¹³

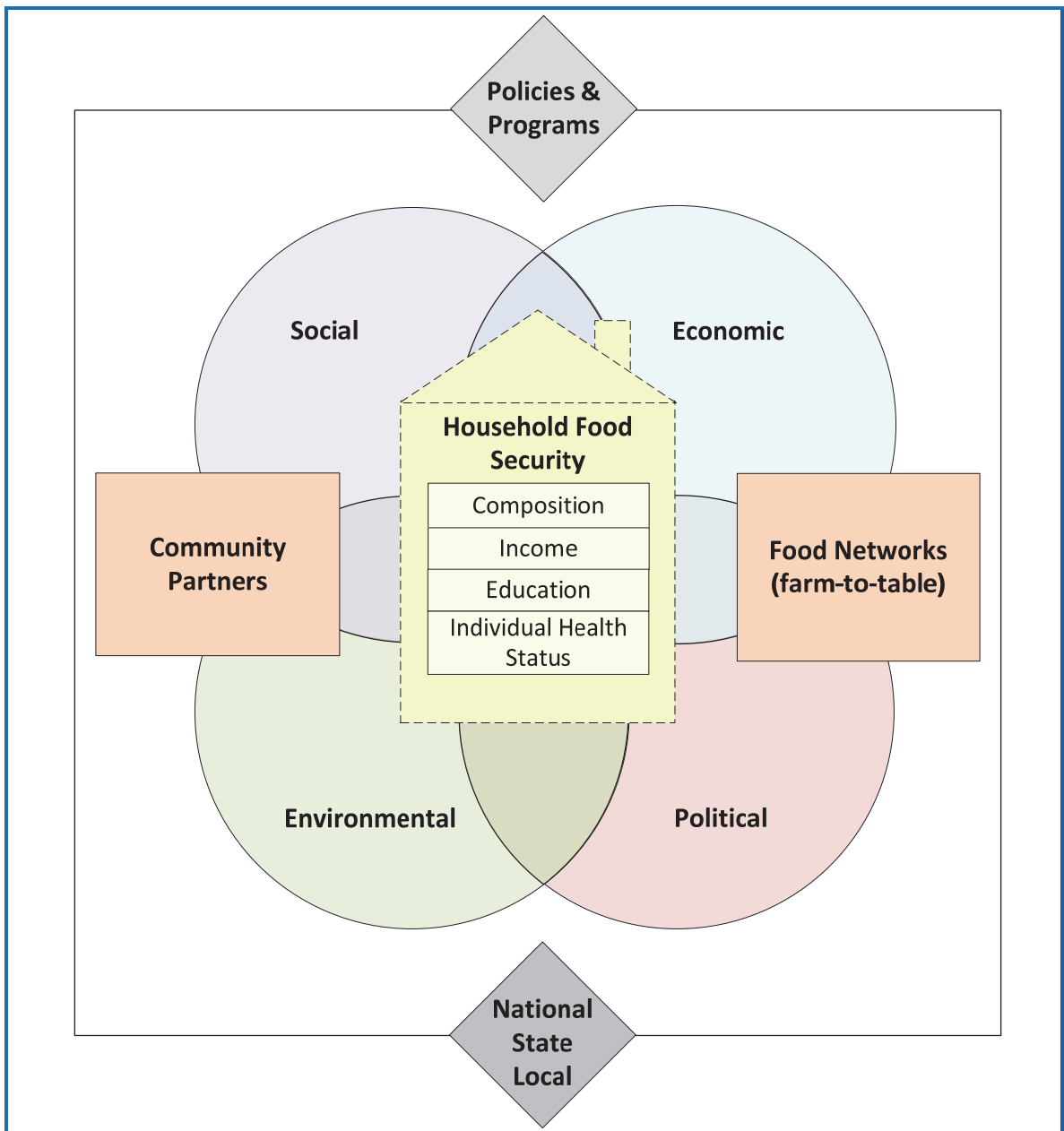


Food insecurity for a household is defined by limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.¹³

Although the definitions of food security and food insecurity may be simple, the determinants and the relationships among determinants of food security are not. As suggested by **Figure 1-1**, health outcomes related to food security status for a given household are influenced by a complex tapestry of “risk factors” (i.e., factors, internal or external, that make a household more or less food secure). This tapestry includes

- Social, economic, environmental, and political domains
- Community partners and businesses, churches, food pantries, and grocery stores that are part of the food environment

Figure 1-1. The Complex Tapestry of Food Security



- Food networks that process and distribute food, and
- Household characteristics that include composition (e.g., number of adults and children), income level, education, race and ethnicity, and health status of individuals (e.g., disabled).

Integral components of this complex tapestry include local, state, and federal policies/programs like SNAP and WIC that have been developed to provide nutrition assistance to millions of eligible Americans. Throughout this report, research on these risk factors and, to the extent possible, the association between (and among) these risk factors and food security are described.

1.2 HOW DO WE MEASURE FOOD SECURITY?

Understanding how food security is measured is critical to understanding what the research on hunger and food insecurity in America means. Beginning with President Reagan’s Task Force on Food Assistance in 1983, a solid foundation was laid on which to build scientifically valid and reliable measures of food security and food insecurity in the U.S. population. The USDA, in collaboration with experts in food security, survey development, and measurement, developed the U.S. Household Food Security Scale (HFSS) over a period of 2 years (1995-1997).

Development of the HFSS involved extensive expert panel review and input, cognitive testing and field testing, and item and scale validation. The initial scale was improved and revised slightly and made available by USDA as a survey module in the Household Food Security Survey Module in the early 2000’s. The HFSS has now been in use widely in U.S. in the annual Current Population Survey, and periodically in several other national surveys, for nearly 20 years. For a complete history on the development of the HFSS see Appendix C. Development of the U.S. HFSS has enabled a large and rapidly-growing body of research on the extent, causes and consequences of food insecurity in the U.S. population, and abroad. Data from these surveys have been used in a large number of research projects over the past two decades. In addition, the measures of food security in the U.S. HFSS have provided invaluable information for decision makers at all levels of government.

The HFSS contains 10 items for households without children and 18 items for households with children (age 0-17), plus a set of screener questions that include the USDA Food Sufficiency Question, and instructions for skipping out, or onto the child scale under certain circumstances. The HFSS asks respondents to assess their experiences over the last 12 months, and provides prompts asking how they occurred based on the initial response. Appendix B lists the HFSS questions. The CPS-FSS also collects data on household food expenditures and use of nutrition assistance programs.

Based on the responses to the HFSS questions, the USDA classifies households into four main categories on a continuum of food security: 1) high food security, 2) marginal food security, 3) low food security, and 4) very low food security. The USDA defines these¹³ terms as follows:

1. **High food security**—Households had no problems, or anxiety about, consistently accessing adequate food.
2. **Marginal food security**—Households had problems at times, or anxiety about, accessing adequate food, but the quality, variety, and quantity of their food intake were not substantially reduced.
3. **Low food security**—Households reduced the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns were not substantially disrupted.
4. **Very low food security**—At times during the year, eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money and other resources for food.

The USDA classifies households as being *food insecure* when the respondent reports 3 or more food insecure conditions on the 10-item adult or household sub-scale of the HFSS. For households with children, reporting 2-4 or more food-insecure conditions for children on the 8-item child sub-scale means that the household includes food insecure children. The households classified as food insecure are divided into those experiencing low food security, and those that are experiencing very low food security. The very low food security category consists of households where at least one member experienced reduced food intake and/or insufficient resources for food disrupted eating patterns. Additionally, households without children receive the designation of very low food security if the respondent selects 6-10 or more food insecure conditions on the 10-item adult scale of the HFSS. Households with children receive the designation if the respondent selects 8 or more conditions on the full 18-item scale, and these households are further classified as having very low food security among children if the respondent reports 5-8 or more food insecure conditions among the children on the 8-item child sub-scale.

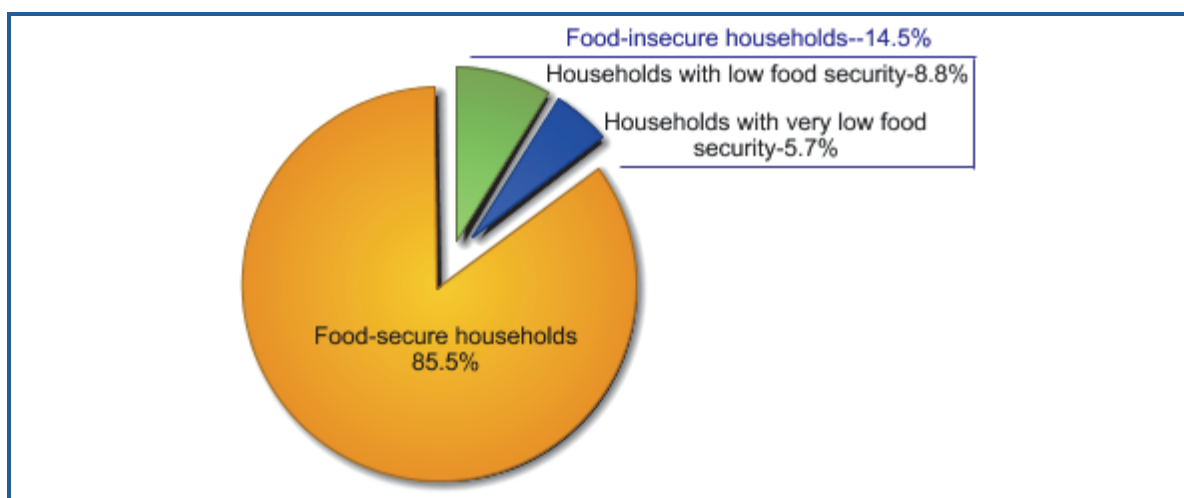
As food security research has grown during this period, so has our understanding of the strengths and weaknesses of food security measures, and of the capacities and limitations of their use in empirical research. Although the HFSS is a validated measure, some researchers have identified limitations associated with it. First, respondents may underreport food insecurity, especially households experiencing severe hardship.^{36, 37} Some have posited that this underreporting may arise from lower thresholds for interpreting deprivation³⁴ or more adaptive coping strategies^{36, 38, 39} among these households. Second, measuring food insecurity among children has also proved challenging, as adult caregivers are more likely to underreport food insecurity among their children.^{37, 40} One study comparing adult responses to adolescents' responses found that adolescents reported a higher prevalence of food insecurity than did their adult caregivers.⁴¹ Another study found that parents' accounts of food insecurity substantially differed from the children's accounts; children reported more frequent times of experiencing hunger than their parents recalled.⁴⁰ Even though these are limitations, they suggest that the current measures of food security and insecurity are conservative measures; the actual numbers of households experiencing food insecurity are likely higher than the ones captured in the HFSS.

1.3 WHAT IS THE CURRENT SCOPE OF FOOD INSECURITY?

The research that we reviewed strongly suggests that food insecurity remains a substantial and intractable problem in the United States. Food insecurity jumped sharply at the start of the Great Recession in 2008, and remains at historically high levels, with the highest rates among households with children, households of persons with disabilities, and racial and ethnic minorities.³³ Prior to 2008, food insecurity rates for U.S. households fluctuated moderately but remained around 11%. Starting in 2008, the prevalence of food insecurity increased quickly to 14.5% (17.6 million households) and has remained around that level through 2012, the most recent year with data available.³³ Using a three year average (2010-2012), ten states exhibited significantly higher rates of food insecurity than the U.S. national average, and 16 states and the District of Columbia exhibited lower rates of food security than the national average.³³

Figure 1-2 provides a breakdown of food secure and insecure households.

Figure 1-2. U.S. Households by Food Security Status, 2012

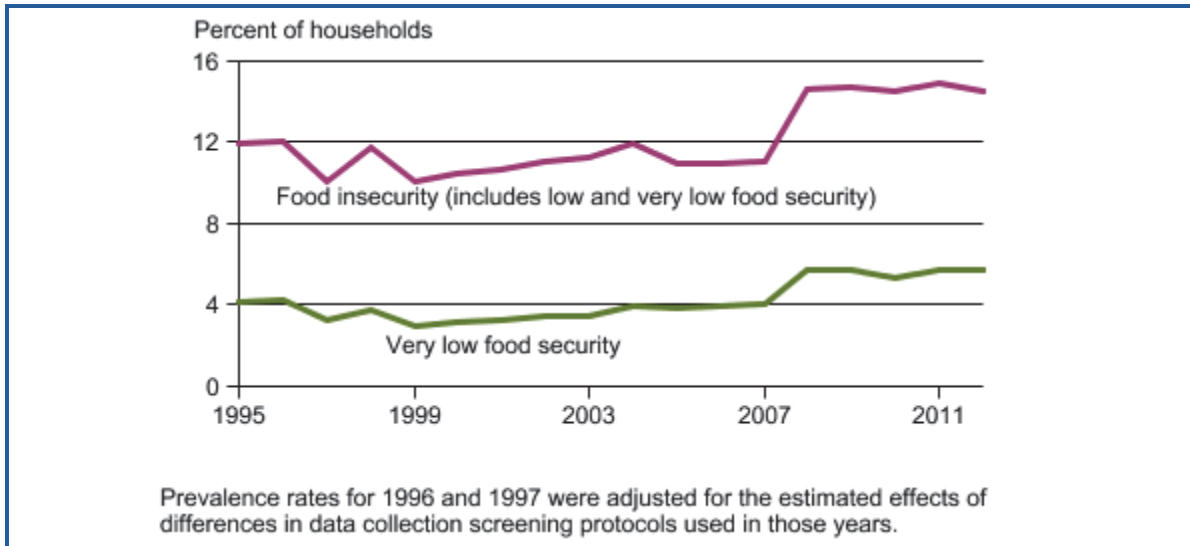


Source: Calculated by ERS using data from the December 2012 Current Population Survey Food Security Supplement.⁴²

Very low food security is a more severe form of food insecurity, characterized by reduced food intake and a disruption in normal eating patterns. The share of U.S. households experiencing very low food security has increased slowly to its current level of 5.7% (7.0 million households). Between 2000 and 2004, the prevalence of very low food security was about 3%, and increased to 4% between 2004 and 2007. Beginning in 2008, the prevalence of very low food security increased to 5.7%, and has remained at approximately that level through 2012.^{33, 42} **Figure 1-3** shows the time trends for low and very low food security from 1995 through 2011.

For most households, food insecurity is episodic. In 2012, a food insecure household experienced food insecurity for an average of 7 months out of the year. Households with very low food security were also food insecure for an average of 7 months per year.³³

Figure 1-3. Trends in Prevalence Rates of Food Insecurity and Very Low Food Security in U.S. Households, 1995–2012



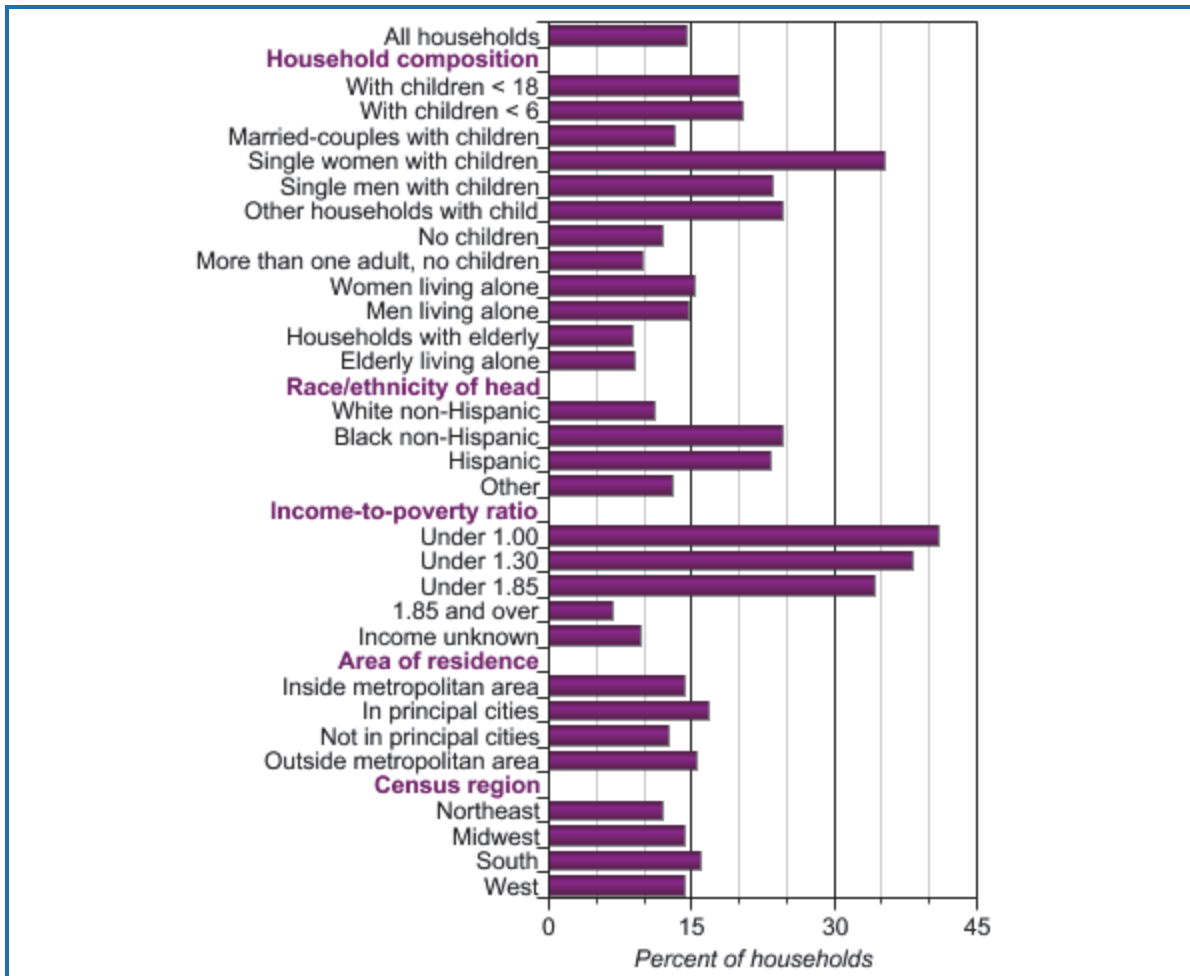
Source: Calculated by ERS based on Current Population Survey Food Security Supplement data.⁴²

Although all households facing food insecurity experience negative consequences of not having enough food, certain populations are more sensitive and/or experience this challenge more acutely. The most recent assessment of household food security (2012) shows that food security disproportionately affects vulnerable populations, including children, the elderly, minorities, and low-income households. **Figure 1-4** from the ERS depicts the prevalence of food insecurity among vulnerable households.⁴²

Twenty percent of U.S. households with children (7.8 million households) experienced food insecurity in 2012; in half of those households, only adults were considered food insecure because adults often shield children from food insecurity. In the other half (3.9 million households), both children and adults were food insecure.³³ Although households with elderly people had lower than the national average prevalence for food insecurity in 2012—8.8% of households with elderly people (2.8 million households) were food insecure, and 9.1% of households with elderly people living alone (1.1 million households) were food insecure.

Minority populations experience higher prevalence of food insecurity than the U.S. population as a whole. In 2012, 25% of African American households (3.7 million households) experienced food insecurity, with approximately 10% experiencing very low food security (1.6 million households). Just over 23% of Hispanic households experienced food insecurity (3.6 million households), and approximately 7% experienced very low food security (1.2 million households).^{33, 43} Only a small percentage of the U.S. population identifies as American Indian on the CPS; thus, national rates of food insecurity are not available for this segment of the U.S. population. However, one small study of 432 American Indian families found that 40% of families participating in the study were food insecure.^{44, 45}

Figure 1-4. Prevalence of Food Insecurity, 2012



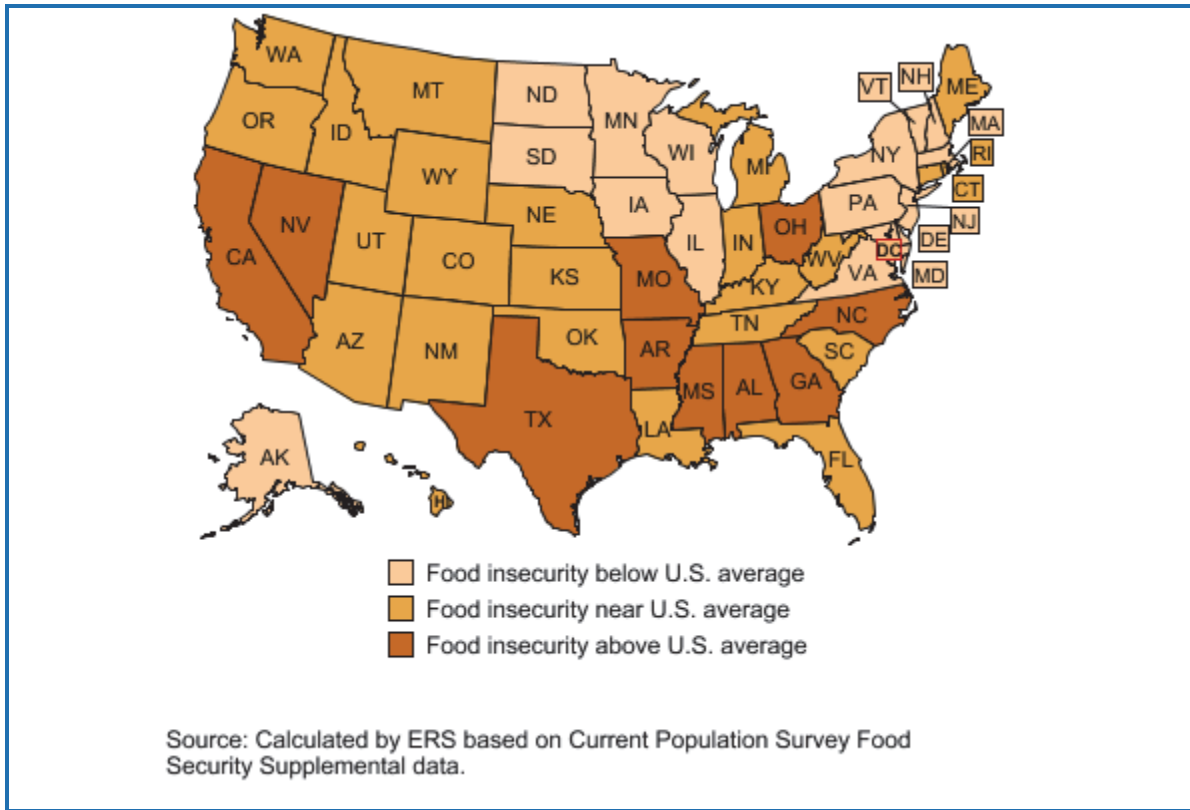
Source: Calculated by ERS using data from the December 2012 Current Population Survey Food Security Supplement.⁴²

The rates of food insecurity were higher for low-income households (under 185% of the Federal Poverty Level [FPL]).^a In 2012, 34.3% of households under 185% FPL (10.7 million households) were food insecure. Additionally, 14.5% of households below 185% FPL experienced very low food security (4.5 million households).³³ Some geographic regions are disproportionately affected by food insecurity. Households in the principal cities of metropolitan areas (16.9%, 5.7 million households) and rural/nonmetropolitan areas (15.5%, 3.1 million households) experience higher than average prevalence of household food insecurity. Similarly, the South (16.0%, 7.3 million households) experienced a higher prevalence of household food insecurity than the Midwest (14.2%, 3.8 million households), West (14.4%, 3.9 million households), and

^a The Federal Poverty Level refers to a set minimum income a family requires for basic needs (i.e., food, shelter, clothing, etc.). The Department of Health and Human Services establishes the FPL annually in order to provide thresholds for individuals to be eligible for safety net programs. The FPL is also adjusted for family size.

Northeast (11.9%, 2.6 million households). Very low food security follows similar geographic patterns but at lower rates.³³ **Figure 1-5** shows the geographic distribution of food insecurity.

Figure 1-5. State Prevalence of Food Insecurity, Average 2010-2102



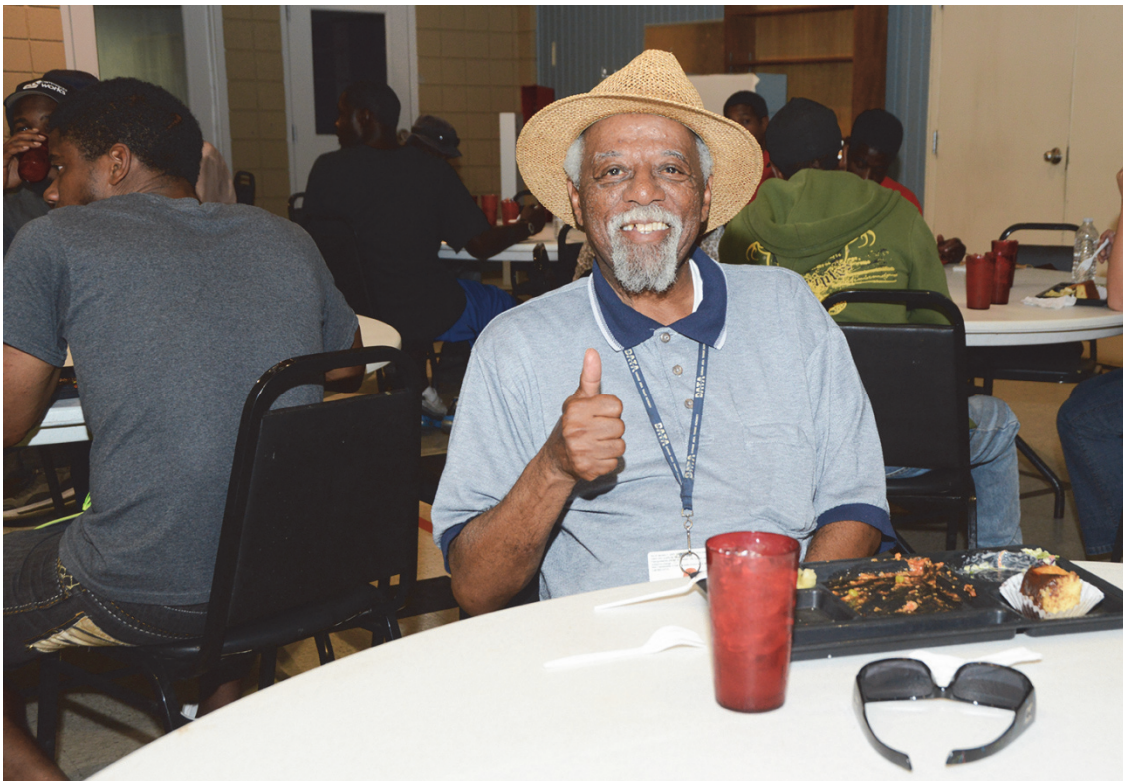
Source: Calculated by ERS based on Current Population Survey Food Security Supplement data.⁴²

1.4 WHAT IS THE PROSPECTIVE SCOPE OF FOOD INSECURITY?

The tapestry shown in Figure 1-1 suggests that the prospective scope of food insecurity will be extraordinarily difficult to predict. Clearly, the time trends in food insecurity prevalence shown in Figure 1-3, demonstrate that major perturbations to the “food security tapestry” such as the Great Recession of 2008 can change the trajectory of food insecurity, establishing a new baseline for Americans. The relationship between food insecurity and the economy is, of course, not surprising given the sensitivity of food insecurity to income. However, there are numerous other perturbations likely in the future, some large (e.g., *environment domain* – climate change) and some relatively small (e.g., *social domain* – demographic shifts). These perturbations and responses by public and private entities will shape new contours for food security in the United States. Although we were able to identify very little research on the prospective scope of hunger and food insecurity, we have included a brief discussion of several likely perturbations, and suggested possible changes to the scope of food insecurity related to (1) effects of an aging population, (2) changes to race/ethnic composition of US population, and (3) shifts in the working age population.

1.4.1 EFFECTS OF AN AGING POPULATION

The U.S. Census Bureau projects that the population will grow from 314 million in 2012 to 399.8 million by 2050.⁴⁶ Seniors (age 65 and older) will comprise a growing proportion of the U.S. population. As of 2012, this group made up approximately 14% of the population; by 2040, this number will increase to about 21% of the U.S. population.⁴⁷ The senior population will also become more diverse over time, with growing numbers of racial and ethnic minorities making up a substantial portion of the aging population. The Administration on Aging estimates that “[b]etween 2012 and 2030, the white (not Hispanic) population 65+ is projected to increase by 54% compared with 126% for older racial and ethnic minority populations, including Hispanics (155%), African-Americans (not Hispanic) (104%), American Indian and Native Alaskans (not Hispanic) (116%), and Asians (not Hispanic) (119%).”⁴⁷



Seniors already experience significant food insecurity, and those numbers are increasing. Since the end of the Great Recession in 2009, the numbers of seniors experiencing hunger have increased significantly; 8.8 million seniors (15% of seniors) faced the threat of hunger in 2011.³⁰ As noted in Sections 2 and 3, seniors and racial and ethnic minorities also have higher rates of hunger than their white counterparts.⁴⁸ Thus, as the U.S. population ages and as the aging population becomes more diverse, food insecurity may also increase. Moreover, food insecurity among seniors, a population more vulnerable to health challenges, may present other social costs, such as snowballing health care expenditures and greater pressure on the health care system.³⁰

1.4.2 CHANGES IN RACE/ETHNIC COMPOSITION

In the 2010 American Community Survey, foreign-born people (all those who are not U.S. citizens at birth, including documented and undocumented individuals) made up approximately 13% of the U.S. population.⁴⁹ U.S. Census Bureau projections estimate that the United States will have about 41.2 million new immigrants from 2012 to 2050.⁴⁶ Although the Census Bureau recently reduced its immigration estimates when immigration declined during and after the recession, immigration is still predicted to increase from 2012 to 2060, from 725,000 foreign-born people immigrating in 2012 to 1.2 million in 2060.

In part due to immigration, the U.S. population will likely become increasingly diverse over the next 50 years. Minorities (nonwhite) will comprise an estimated 57% of the U.S. population in 2060, up from 37% in 2012. The African American population may grow from 41.2 million in 2012 to 61.8 million by 2060, representing a change from approximately 13% of the population in 2012 to about 15% in 2060. The Hispanic population will likely increase from 53.3 million in 2012 to an estimated 128.8 million by 2060, representing 1 in 3 people in the U.S. population. Growing from 15.9 million in 2012 to 34.4 million in 2060, the Asian population may comprise about 8% of the U.S. population by 2060, up from 5% in 2012, and American Indians and Alaska Natives are predicted to increase from 3.9 million in 2012 to 6.3 million by 2060.⁵⁰

Currently, racial and ethnic minorities (both US- and foreign-born) have a higher prevalence of food insecurity, both as individuals and as households than white individuals and households.²⁹ ⁴⁹ In addition, many new immigrants not only lack financial resources, but also may have difficulty navigating local food systems and accessing public and private assistance programs. Should the projected growth continue without (or with minimal) improvement in minority economic conditions in the future, food insecurity in the US population will likely escalate.

1.4.3 SHIFT IN WORKING-AGE POPULATION

Changes in the working-age population may also affect food security in the United States. “The working-age population (18 to 64) is expected to increase by 42 million between 2012 and 2060, from 197 million to 239 million, while its share of the total population declines from 62.7 percent to 56.9 percent.”⁵⁰ At the same time, the demand for safety net programs—including food assistance programs—may increase as the population ages. Given these projections, a smaller proportion of working-age people may have to support the social safety net, placing greater strain on the safety net programs that food-insecure individuals and households depend on. Given the current tax policies, the shift in working-age population may pose a risk to public infrastructures.

2 KEY DETERMINANTS OF FOOD INSECURITY

Multiple “risk factors” contribute to food insecurity.³⁴ Key determinants of food insecurity include individual and household characteristics and contextual factors. Individual and household characteristics that have been linked to food insecurity include low socioeconomic status (SES), race and ethnicity, immigration status, disability, household composition, health status, violence, and social capital. Contextual factors encompass environmental conditions/geography, economic conditions, and the broader food system. This section describes the major determinants of food insecurity and summarizes the body of recent research in this area. Significant determinants of food insecurity include

- *Prevalence of food insecurity among households with children (20%) is higher than the national average (14.5%)*
- *Low socioeconomic (SES) predicts food insecurity, and income (a key component of SES) consistently correlates with household food insecurity, but does not predict it perfectly*
- *African American, American Indian, and Hispanic households experience food insecurity at higher rates than white, non-Hispanic households*
- *Economic hardships, including unemployment status and low SES, are key determinants of food insecurity among racial and ethnic minorities*
- *Prevalence of food insecurity among immigrant households is estimated to be nearly twice as high as the prevalence of food insecurity among nonimmigrant households in the United States*
- *Children in households headed by single women are disproportionately affected by food insecurity; approximately half of all households with food insecure children are headed by single women*
- *Households that include persons with disabilities experience higher rates of food insecurity; nearly one-third of food insecure households include a working-age adult with a disability*
- *The relationship between food security and health is often bidirectional—poor health is both an outcome and a risk factor for food insecurity*
- *Increasing energy and food prices have been shown to negatively affect the food security status of households, leading to poor child health outcomes and increased hospitalizations*
- *When neighborhood housing costs are high and exceed a significant portion of the household income, families have higher chances of experiencing food insecurity*

- *Experiencing prolonged unemployment and underemployment can contribute to a “financial cascade” which increases the number of food insecure households that rely on private and/or public food assistance programs.*

2.1 INDIVIDUAL AND HOUSEHOLD CHARACTERISTICS

2.1.1 LOW SOCIOECONOMIC STATUS (SES)

Low SES predicts food insecurity and is associated with recurrent food insecurity.^{33, 51} SES, a complex construct, includes “ownership of, control over, or access to economic resources and the social standing or influence associated with those resources”^{29 p. 39}). It encompasses a range of factors, such as income from paid employment and other sources (e.g., profits, rents), wealth (e.g., assets, investments, properties), occupational prestige/ranking, neighborhood characteristics, social capital, and education. Higher proportions of households and individuals with low income, wealth, and education experience food insecurity more frequently than households and individuals with higher levels of these factors (see also McIntrye et al.⁵²).^{33, 34}



Income, a key component of SES, strongly predicts food security.⁵³ In assessing income and its association with food insecurity, most researchers rely on the FPL as a benchmark for establishing whether households experience poverty. In a 2012 report, about 7% of households with incomes above 185% of the FPL were food insecure, compared to about 41% of households with incomes below the official poverty line.³³ On average, households below the FPL experience food insecurity because income from paid employment or other sources does not provide adequate resources for a household to become or stay food secure.³⁴ In general, households with earners of lower incomes are more likely to experience food insecurity.⁵² Households in which adults have nonstandard work arrangements (e.g., work more than one part-time job) can often have unstable incomes, which contributes to food insecurity.⁵⁴

The extremely poor (households with incomes below 50% of the FPL) experience extraordinarily high prevalence of food insecurity. A subset of this group, non-working adults either are unable to access or have limited access to safety net benefits because of policy changes over the last 20 years; at the same time, many cannot attain self-sufficiency and become food secure because of barriers to employment (e.g., difficulty in finding child care, low educational attainment), or because they are paid at or below the minimum wage.⁵⁵

Although income is negatively correlated with food insecurity, it does not predict it perfectly. Income alone cannot explain why people are or become food insecure; it does not account well for regional food price variations, differing household expenses (e.g., health or child care costs), or temporary financial setbacks.⁵² Some households with low income (at or below the FPL) are food secure, whereas other households above the FPL are food insecure. Gunderson³⁴ points out, “Almost 60% of children in households close to the poverty line are not in food insecure households ... At 200% of the poverty line, over one-in-five children are in food insecure households” (p. 5). Thus, working and earning an income do not guarantee food security. There is evidence that households with the lowest levels of food expenditures (a correlate of food insecurity) tend to under-report food hardships, which suggests that food insecurity is more severe among the poorest households than currently reported.³⁶

Research has suggested reasons for how and why some low-income households manage to remain food secure while households with more resources (i.e., 185% or more above the FPL) do not.^{34, 56} Low-income, food-secure households may supplement their resources with public and private assistance (e.g., SNAP,² WIC, Supplemental Security Income, free groceries from food pantries), whereas households with slightly greater income may not be eligible and thus may not benefit from such programs.^{34, 57} Alternatively, households purportedly below the FPL may use informal coping strategies to either directly acquire food or increase their resources for buying food (e.g., asking for food from friends or family, selling homemade items). A recent National Research Council Institute of Medicine (IOM) report⁵⁷ (p. 14) suggested that 1) financial management skills may differ between poor households that are food secure and

² The Supplemental Nutrition Assistance Program, or SNAP, was originally called the Food Stamp Program (1974-2008). In 2008, it was renamed SNAP to reflect the program’s mission of providing *nutritional* food assistance.

those with more resources that are insecure^{58, 59}; 2) poor, food-secure households may employ a range of coping strategies (e.g., social networks) more effectively than some better-resourced households^{38, 39}; 3) better-resourced households may have more fixed expenses (e.g., mortgages); or 4) better-resourced households may interpret questions about food sufficiency differently from households that regularly experience food insecurity.³⁴

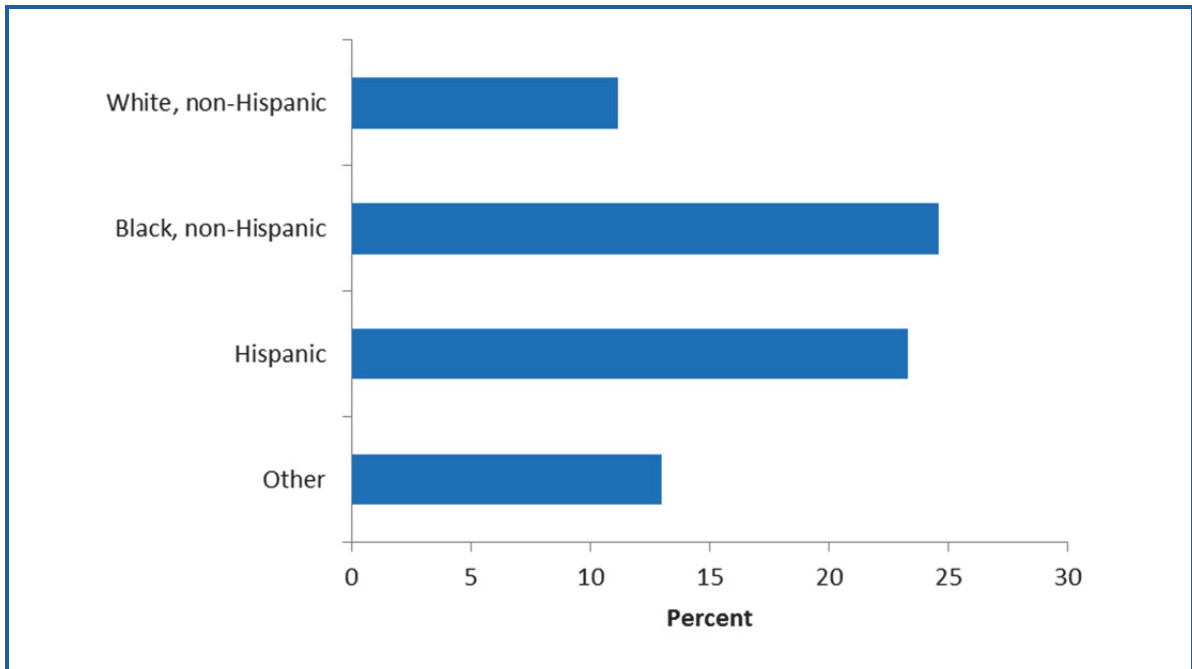
Another aspect of SES, educational attainment or “the highest level of education an individual has completed,”⁶⁰ correlates with food insecurity, with lower levels of adult education linking to higher prevalence of food insecurity.^{34, 52, 61} For instance, food insecurity rates are 42.4% among households in which the most highly educated adult has less than a high school education (1.1 million households), 29.6% among households with a high school degree or GED (2.5 million households), 24.5% among households with some college, including 2 year degrees (3.1 million households), and 8.1% among households in which the household head has a Bachelor’s degree or higher (1.2 million households).^{62, 63} Although some of the difference stems from higher incomes and lower rates of unemployment among people with more education, low education appears to be a risk factor even after accounting for income and employment differences.³⁴ The ways in which education contributes to food security, beyond increasing income, are not well understood, but could potentially be associated with differences in financial management or other skills.³⁴

2.1.2 RACE AND ETHNICITY

As suggested by Figure 2-1, disparities in food insecurity exist among racial and ethnic groups. African American, American Indian, and Hispanic households experience food insecurity at higher prevalence than white, non-Hispanic households.^{33, 51, 53, 64-66, 67} Economic, social, and environmental factors are linked to food insecurity among non-white households, including employment status and wage levels,⁶⁸ SES,^{52, 68} and neighborhood environment.^{29, 69}



Figure 2-1. Prevalence of Food Insecurity by Race/Ethnicity, 2012



Source: Coleman-Jensen et al., 2013³³

Economic hardships (e.g., unemployment status) are key determinants of food insecurity among racial and ethnic minorities.^{67, 68} Greater proportions of racial and ethnic minorities are earning lower incomes and experience higher rates of unemployment, and are more likely to struggle with poverty than white non-Hispanic households.^{29, 70} For example, nearly 26% of American Indians in the United States live below the poverty line, and in some reservations as many as 50% live in poverty.²⁹

Environmental factors that may contribute to food insecurity among racial and ethnic minority groups include access to social resources⁷¹ and food retailers^{29, 69} within the community or neighborhood in which they live. Households in high-poverty neighborhoods have less access to social services, including child care; transportation; job training; substance abuse treatment; or other, similar social services.⁷¹ These services often are located in low-poverty neighborhoods and in predominately white areas.⁷¹ Racial and ethnic minorities also tend to live in areas with poor access to healthy and affordable foods,^{29, 69} relying on small, independent stores and convenience stores that often have a poor selection of healthy foods and higher food prices.⁷² For example, African American and Hispanic communities have fewer supermarkets and chain stores and a higher prevalence of small, independent stores and convenience stores than predominately white non-Hispanic communities.^{72, 73} Moreover, African American and Hispanic populations have one-half to one-third the access to chain supermarkets, respectively, as non-Hispanic whites.⁷³

2.1.3 IMMIGRATION

Prevalence of food insecurity among immigrant households is estimated to be nearly twice as high as the prevalence of food insecurity among nonimmigrant households in the United States.⁷⁴ Individuals in households who recently immigrated to the United States report challenges with food insecurity that are particularly acute for resettled refugees.^{29, 74-78} Furthermore, children of immigrant households are disproportionately affected by food insecurity: children with noncitizen mothers are more than twice as likely to be food insecure as children with native-born parents.^{65, 79}



Immigrant and refugee households may experience higher rates of food insecurity because of economic hardship,^{74, 78} difficulty navigating the food environment,^{29, 77, 78} and lack of knowledge of U.S. culture and language,^{76, 78} and they are less likely to access social services such as WIC or SNAP.⁶⁵ We discuss each of these barriers below.

High rates of food insecurity among immigrants and refugees may be attributed to economic hardship after resettlement.⁷⁸ New immigrants and resettled refugees often lack financial resources and have difficulty gaining and retaining employment⁷⁴ or have low-wage, seasonal, or unstable work, which contributes to food insecurity.²⁹ Lack of financial resources may also result in substandard housing or the inability to cook or store food, thus exacerbating food insecurity.^{29, 80}

Immigrants and refugees may not only lack financial resources, but also have difficulty navigating the food environment due to language⁷⁷ and/or cultural barriers. Food conditions in

the United States are vastly different from the conditions in immigrant or refugee home countries.⁷⁸ Many immigrants grew their own food in their home country but become food consumers after resettling in the United States. This transition changes the way individuals “shop, produce, and consume food” (p.57),²⁹ and they may not be able to afford culturally acceptable foods.⁷⁸ Acculturation is a complex social phenomenon, however, and extant research on its relationships to food security is incomplete and needs further development.

Social services, such as WIC and SNAP, are designed to alleviate food insecurity. However, low-income immigrants are less likely to seek social services than nonimmigrants.⁶⁵ Federal laws and regulations grant eligibility for SNAP to many “qualified aliens” or non-citizens (<http://www.fns.usda.gov/node/9141>); however, lack of knowledge about such eligibility criteria can deter eligible, qualified non-citizens from applying. Immigrant adults who lack appropriate documentation may be reluctant to access services because they fear deportation.²⁹ Immigrant families often have mixed documentation status; children born in the United States are citizens, but the parents may not be documented. Many of these immigrant families “act like [everybody’s] not documented.” Similarly, undocumented workers may be unable to access public assistance programs because of actual or perceived documentation status and work schedules,⁸¹ resulting in higher prevalence of food insecurity.^{80, 81}

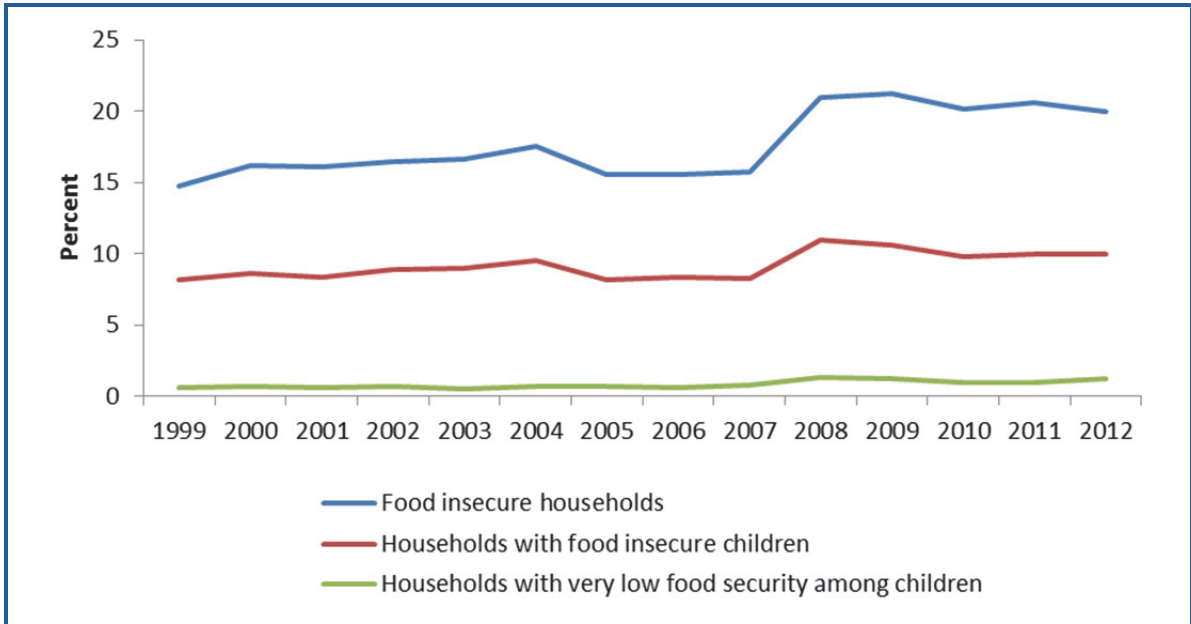
2.1.4 HOUSEHOLD COMPOSITION

Numerous aspects of household composition are associated with food insecurity among adults and children, including presence of children,^{33, 53, 82} women as head of household,^{29, 53, 62, 63, 83} and multigenerational families in a single dwelling.^{30, 34, 84, 85}

Households with children experience food insecurity more often than those without children. **Figure 2-2** shows the prevalence of food insecurity among households with children. The prevalence of food insecurity for all households with children (20%) is higher than the national average (14.5%).³³ Food insecurity in households with children has increased over the last 14 years ranging from a low in 1999 of 14.8% to a high of 21.3% in 2009 and since has declined to 20.0% in 2013.^{66, 86} Parents often try to mitigate the effects of food insecurity on their children by reducing their own food intake.⁸⁶

Food insecurity is more prevalent in households headed by single women than in households headed by single males or married couples.^{33, 53, 62, 63, 83} Female-headed households often have lower household incomes than male-headed households and may lack material resources to purchase sufficient food for the household.⁸³ Children in households headed by single women are disproportionately affected by food insecurity. Approximately half of all households with food-insecure children and 54% of households with very low food-insecure children are headed by single women.⁵³ However, marriage and cohabitation do not consistently decrease food insecurity. In white and Hispanic households, a mothers’ entrance into marriage or cohabitation reduced food insecurity, but marriage and cohabitation have no effect on food insecurity in African American and households of other racial and ethnic backgrounds.⁸⁷

Figure 2-2. Prevalence of Food Insecurity among Households with Children



Source: Coleman-Jensen, 2013³³



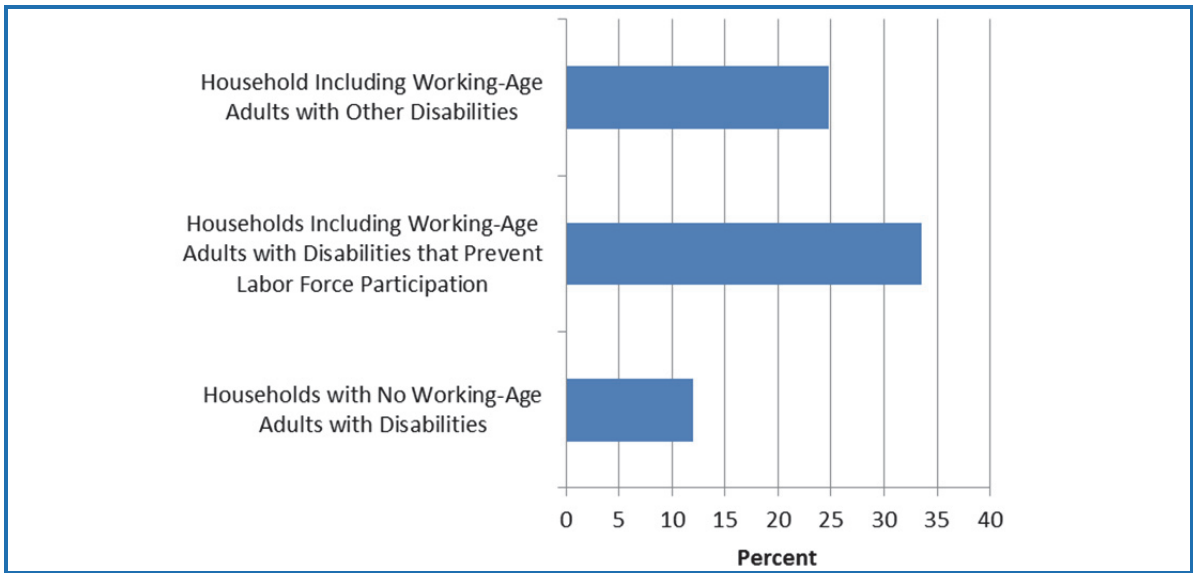
The effects of having a multigenerational household differ among household members.³⁴ Having a grandparent in the household improves food security for children, but living with grandchildren increases rates of food insecurity for the grandparents.^{30, 84, 85} Having a grandparent in the house may mitigate food insecurity among children because grandparents may provide a less expensive form of child care, allowing more material resources to be allocated to food, or enabling other adults in the household to work for pay. In addition, living with a grandparent may serve as a proxy for social capital.³⁰ Although grandchildren may be protected from food insecurity by living in households with grandparents, the grandparents experience higher levels of food insecurity when living with grandchildren. Rates of food insecurity in households with a grandchild present are at least twice as high as households without a grandchild present, and very low food security increases substantially faster among these households over the past decade.³⁰ It is not well understood why grandparents living with grandchildren experience higher rates of food insecurity.

2.1.5 DISABILITY

Households that include persons with disabilities experience higher rates of food insecurity.^{34, 63, 86, 88} Nearly one-third of food-insecure households include a working-age adult with a disability, and 38% of households with very low food security include a working-age adult with a disability.⁸⁶ Households with adults whose disability prevents labor force participation or adults who have other disabilities (but potentially could work with appropriate accommodations) have a 33.5% and 24.8% prevalence of food insecurity, respectively.⁸⁶ Compared to the prevalence rate for households with no working-age adults with disabilities (12%), these prevalence rates are particularly striking.⁸⁶ **Figure 2-3** depicts this difference in prevalence of very low and low food security in households including adults with disabilities. Among the households that include individuals who could work with appropriate accommodations, those with “vision, mental, and physical disabilities [had] higher odds of food insecurity than...hearing, self-care, and going-outside-home disabilities” (p. iii).⁸⁶ Thus, the type of disability influences the chances of a household experiencing food insecurity, which also suggests that providing workplace accommodations for persons with certain types of disability can mitigate food insecurity.

Disabilities are also an important risk factor for food insecurity in households with children.^{62, 63} Households with an adult with a disability have lower household incomes because of lower levels of employment (and income). Individuals with disabilities often have higher health care expenses, reduced earnings, and higher prevalence of poverty related to having a disability. Moreover, individuals with disabilities may require care from other household members, which can limit labor force participation among household caregivers. Even after accounting for lower income, receipt of disability assistance (e.g., SSI, SSDI, or other), and access to health coverage (i.e., Medicaid or Medicare), households with a disability have a significantly higher likelihood of food insecurity.^{63, 86}

Figure 2-3. Prevalence of Food Insecurity in Households with Working-Age Adults



Source: Coleman-Jensen, 2013⁸⁶



2.1.6 POOR HEALTH STATUS

The relationship between food security and health is often bidirectional—poor health is both an outcome and a predictor of food insecurity.⁵⁷ Food insecurity can contribute to poor health, and being in poor health can make gaining employment or staying employed more difficult, further reducing food security.^{89,90} Food insecurity often exacerbates health conditions and contributes to even worse health outcomes for a range of diseases (e.g., diabetes, HIV).⁸⁹⁻⁹¹ Indeed, one study showed that a third of chronically ill adults cannot afford both food and medicine,⁹² thus creating the circumstances that necessitate “trade-offs” in deciding whether to purchase food or their medicine.



The relationship between food insecurity and health is also bidirectional across all age groups. Child food insecurity is linked to worse child health outcomes;⁹³ food insecurity increases the risk for nutrient deficiencies (i.e., iron-deficient anemia), developmental problems, and hospitalizations among very young children.¹⁴ Older adults in poor health and with limited ability to perform activities of daily living (ADLs) report experiencing food insecurity. Food-insecure senior citizens tend to lack adequate nutrient intake to support health⁹⁴ and, in one study, the authors estimated that one third to one half of all health conditions in seniors are attributable to nutrient deficiency (Ryan and Bower, 1989 cited in Ziliak⁹⁴).

Food security researchers have also found a bidirectional relationship between food insecurity and mental health problems. Mental health challenges can contribute to food insecurity, but food insecurity can also contribute to mental health challenges. Those experiencing food insecurity report higher rates of mental illness⁹⁵, and poor emotional health is associated with

food insecurity.⁹⁶ One Canadian population-based study of people experiencing food insecurity found that the prevalence of having a mental health diagnosis was 35% among that population.⁹⁵ In this study, the odds of having a mental illness diagnosis were also higher for women, single-parent households, and nonimmigrants.⁹⁵ Among rural families, depression predicted persistent food insecurity.⁹⁷ In a study of rural mothers, depression and food insecurity mutually reinforced each other,⁹⁸ and postnatal depression is linked with household and child food insecurity.⁹⁹

2.1.7 EXPOSURE TO VIOLENCE

Exposure to violence from childhood through adulthood is an important factor in caregivers' mental health status as it relates to food security. Chilton and colleagues' qualitative and mixed-methods studies found an association between exposure to violence across the lifespan and very low food security, as well as high levels of depression, stress, and anxiety among food insecure mothers.^{100, 101} Homeless and low-income mothers who experienced sexual abuse in childhood were over four times more likely to experience food insecurity than women who had not been abused.¹⁰² In this same population, child hunger was more prevalent in households in which mothers' experienced higher odds of posttraumatic stress disorder and substance abuse.¹⁰³ Food insecurity and domestic violence were highly correlated among women participating in cash assistance in Michigan.¹⁰⁴ In a longitudinal study of 1116 families with twins, mothers in persistently food insecure homes were more likely to have experienced domestic violence, and had higher rates of depression and psychotic spectrum disorders.¹⁰⁵ Another longitudinal study found an association between exposure to intimate partner violence and food insecurity that was mediated by maternal depression.¹⁰⁶

2.1.8 SOCIAL CAPITAL

Social capital refers to the tangible and intangible benefits or resources available to individuals by virtue of their membership and participation in social networks or social groups, such as families, churches, or communities.^{51, 107} Having social capital enables individuals to gain access to material resources by drawing on personal relationships to achieve goals (e.g., finding a job, getting food or financial assistance during hard times).¹⁰⁷ Thus, social capital is also associated with having financial resources (e.g., income and employment opportunities) and forms of emotional and social support.¹⁰⁸ Having social capital can have implications for an individual's, family's, household's, and community's ability to become and/or remain food secure.⁵¹

Food security researchers have examined social capital at the individual, family, household, and community levels, and in each instance, having social capital was associated with lower prevalence of food insecurity and better intake of nutritious foods.^{51, 61} Individuals and families can rely on familial support and networks when experiencing food insecurity; support from family can include transportation assistance to access foods, meal assistance, emotional support, and financial support.⁵¹ When households include individuals with social capital (e.g., individuals involved in local civic organizations), those households have greater access to coping strategies, such as borrowing food, getting transportation to the supermarket from

neighbors, or reaching out to church food pantries, which were unavailable (or less available) to households with lower levels of social capital.¹⁰⁹

Having social capital appears to afford individuals and households with more coping skills with which to manage circumstances that contribute to individual and household food shortages (e.g., job loss, low income, health costs). However, like other forms of “capital,” social capital is not evenly distributed in the U.S. population, and is intertwined with the other determinants of food insecurity discussed in this section. For example, in one study including Hispanic households, those households had lower social capital and higher prevalence of food insecurity than similarly resourced white households. The Hispanic households reported fewer coping strategies (e.g., borrowing money from neighbors, asking neighbors to shop for groceries) to rely on when the food supply was insufficient.¹⁰⁹



Communities with higher social capital provide network- and service-“rich” environments that community members can draw on; these environments have neighborhoods with stronger social ties, local transportation services, child care services, and accessible food programs.⁵¹ As Smith¹¹⁰ notes, communities with strong civic engagement can enhance food security of its members because active institutions collaborate to support and maintain the local food safety net system.

2.2 CONTEXTUAL FACTORS

In addition to individual and household factors, a number of contextual influences affect the ability of individuals and households to remain food secure. Geography and economic forces

were the most cited contextual factors influencing food security. Geographic factors include proximity to resources and location (urban or rural); economic factors consist of energy prices, food prices, housing security, and employment.

2.2.1 GEOGRAPHY

Geography influences food insecurity in several ways, including proximity to food retailers and the location of safety net programs. A close proximity to food retailers allows families to purchase affordable nutritious foods while incurring lower transportation costs, and the availability of nearby safety net programs can reduce food insecurity [Allard cited in IOM⁵⁶].

Communities that have limited access to affordable and nutritious food are commonly referred to as “food deserts.”¹¹¹ Although a small percentage of the U.S. population is affected by issues related to access to grocery stores (5.4% live more than 0.5 mile from a store and do not own a vehicle), about 4.1% of the population lives in low-income areas more than 1 mile from a grocery store. When households are not close to supermarkets and grocery stores (i.e., more than 15 miles away), they have a higher risk of food insecurity¹¹² even after controlling for economic and contextual factors.

However, the research is ambiguous with regard to exactly how proximity to food outlets contributes to food insecurity. Allard and Schafer¹¹³ found that vulnerable groups have at least comparable access to food resources as less vulnerable groups even though access to SNAP-certified stores was, in some cases, correlated with lower rates of food insecurity. In another study, Bonanno et al.¹¹⁴ found that households near medium-large grocery stores had lower risks of food insecurity, especially low-income households with children. In contrast, low-income households near convenience stores *attached to gas stations* had a higher risk of experiencing food insecurity. However, in this study, the presence of large retail grocery stores like supercenters was not associated with food insecurity.¹¹⁴



The presence of private charitable food providers is often much higher in high-poverty areas.¹¹⁵ These providers can offset the potential effects of limited grocery store access; however, environmental and social factors can influence whether and how individuals use charitable food providers. The distance to food safety net programs, as well as a lack of transportation options may block this coping strategy.⁵⁷ Similarly, social factors may also impede strategies to reduce food insecurity; the perceived stigma in using the food pantries,⁶¹ or avoidance of racially or ethnically segregated neighborhoods may block access to a food provider.⁵⁷



2.2.1.1 URBAN SETTINGS

Understanding the factors contributing to food insecurity in urban areas is especially important because household and child food insecurity are highest in the principal cities of metropolitan areas.³³ These urban areas often have higher levels of income inequality and racial segregation,⁷¹ as well as less access to supermarkets.¹¹⁶ A review of recent studies also showed that African American neighborhoods that relied heavily on public transportation have less access to supermarkets and other stores that sell healthy, affordable foods. Jiao et al.¹¹⁷ found that only one-third of low-income people in King County, WA, had access to a supermarket within walking distance, and only 3% of those people had access to a low-cost food store.

2.2.1.2 RURAL SETTINGS

Although principal cities often experience high rates of food insecurity, nonmetropolitan counties have higher food insecurity rates than metropolitan counties. This situation is primarily due to limited access to public transportation and greater distances to food sources in rural areas.¹¹⁶ Rural areas also often have fewer services for families experiencing food insecurity, and the population tends to have lower levels of educational attainment. As a result, rural populations can have higher levels of under- and unemployment, both shown to be

determinants of food insecurity as discussed below.²⁹ Families facing food insecurity in rural areas rely largely on social support when food relief organizations are not available to assist them. This type of informal support includes the provision of food, information, or emotional support, often from family members and friends and somewhat less often from neighbors.⁵⁶



2.2.2 ECONOMIC FORCES

A large body of data have shown that the Great Recession strained households in a variety of ways, compounding existing household challenges, such as high energy costs,¹⁴ food prices,²⁹ housing costs,³⁰ and unemployment.³¹ Because energy, food, and housing constitute a substantial portion of a household's expenses, households juggle these expenses, often trading off paying one expense over another (e.g., not paying the electric bill on time in order to pay for rent,¹¹⁸ not paying rent on time to purchase food). In this section, we review the effects of each of these challenges, and how these effects can place households at a higher risk for food insecurity.

2.2.2.1 HIGH ENERGY PRICES

Energy security is defined as the ability "to obtain energy needed to heat/cool their home and operate lighting, refrigeration, and appliances while maintaining expenditures for other necessities (e.g., rent, food, clothing, transportation, child care, medical care)"⁸, pp. e869-e870). Rising energy prices can negatively affect the food security status of a household; families may

have to choose between paying for energy and paying for household food.⁸ Several studies have shown a positive correlation between energy insecurity and food insecurity.^{8, 14, 119}

Several studies have shown that energy insecurity is associated with poor child health, and increases the likelihood of hospitalizations for children.^{8, 14} Negative health outcomes for children are largely a function of tradeoffs in an energy-insecure home environment; purchases related to medical needs (e.g., prescriptions) may take priority over food and, consequently, the child may experience food insecurity. Additionally, energy security can affect a household's ability to power medical devices or refrigerators or pay for a phone to answer important phone calls, like job interviews, thus exacerbating food insecurity.

2.2.2.2 RISING FOOD PRICES

A number of factors influence the price of food, including increases in the global demand for food from developing countries, droughts in grain-producing regions, and use of feedstock for ethanol biofuels.¹²⁰ When food prices increase, they often outpace the adjustments made to the Thrifty Food Plan (TFP) costs, which are a factor in determining the maximum SNAP allotments. The TFP is used as the national standard for "a market basket of foods which, if prepared and consumed at home, would provide a complete, nutritious diet at minimal cost" (p. 3).³² Because the TFP is used by the government to determine the maximum amount of SNAP benefits given to families of varying sizes, price increases may substantially reduce the amount of nutritious food that can be purchased.



Currently, the TFP does not accommodate costs associated with food procurement and preparation. Pre-packaged foods that are easier to prepare and serve, such as bagged lettuce and baby carrots, cost more than heads of lettuce or whole carrots, but working parents may opt to trade-off a higher cost for more time.⁵⁶ As a recent IOM report notes, “Given this trade-off, the earned income deduction at its current level may reduce the overall purchasing power of the SNAP allotment, especially for those facing time constraints such as households headed by a working single mother” (p. 156).^{56, p. 156} When food prices outpace benefit adjustments and time trade-offs are needed, families are often unable to purchase enough food with available benefits.³² This trend has affected Hispanics and African Americans most negatively.¹²¹

2.2.2.3 HOUSING COSTS

Housing costs comprise the largest portion of most household’s budget. When neighborhood housing costs are high and exceed a particular portion of household income, families have a higher likelihood of experiencing food insecurity.^{112, 122} For example, Kirkpatrick et al.¹⁵ found that families with rent that either required more than 30% of their income, or that were behind in the rent, were more likely to be food insecure. In a cross-state study¹²² and a study of Wisconsin community characteristics¹¹² and food insecurity, Bartfeld et al. showed that higher housing costs increased the likelihood of food insecurity. The authors explained that “[t]he magnitude of the impact—a \$100 increase in median rent is associated with a 21% increase in the odds of food insecurity—is fairly similar to estimates from cross-state analyses, which found that a \$100 increase in median state rent was associated with a 17% increase in the odds of food insecurity (p. 478).¹¹² Reducing the proportion of income required to pay for housing can improve chances of achieving food security. For instance, families with subsidized housing had a lower chance of being food insecure compared with those on a waiting list for such housing.¹⁵

2.2.2.4 UNEMPLOYMENT AND UNDEREMPLOYMENT

Unexpected job loss and underemployment disrupt a family’s income and stability, as well as their ability to remain food secure;^{54, 123} the reduction in household income diminishes the household’s ability to purchase food.¹¹⁸ In addition to income losses, unemployed and underemployed individuals may have unpredictable schedules that can hinder their ability to prepare food. As Coleman-Jensen explained, “Even though they may not be currently working, they are likely engaged in job search activities including preparing job applications and interviewing that may make their schedule unpredictable and may reduce time available for food provisioning” (p. 94).⁵⁴

Experiencing prolonged unemployment and underemployment can contribute to cumulative financial challenges, or a “financial cascade” (p. 23),¹¹⁸ which can translate into food insecurity, poor health (e.g., inability to purchase medications), and/or housing loss. For example, the Great Recession affected households’ employment status through massive layoffs. Between the start of the recession in December 2007 until its official end in 2009, the number of U.S. workers unemployed more than doubled, increasing from 7.4 million to 15.1 million (data not seasonally adjusted). The large number of U.S. families experiencing unemployment and

underemployment during the recession increased the numbers of individuals relying on private and public food assistance programs to provide enough food for their families.¹²⁴

Because of the slow recovery from the recession, employment levels have not returned to pre-2008 levels. The loss of income from unemployment (and underemployment) translates into fewer resources for households and, thus, food insecurity in those households. The effect of chronic unemployment meant that many breadwinners had to settle for nonstandard work arrangements, such as combining multiple smaller jobs, which often leads to unstable incomes and an increased likelihood that those families will experience food insecurity.⁵⁴

Unemployment has also remained chronically high in some populations (e.g., African Americans).^{125, 126}

3 CONSEQUENCES OF FOOD INSECURITY

Food insecurity has broad social consequences for children, adults, and senior adults. Lacking money or other resources to obtain sufficient food poses many challenges; contributes to broader social problems; and can have far-reaching impacts on the U.S. health system and economy in the near- and long-term. For children, experiencing food insecurity can result in near-term developmental delays and poor health outcomes,^{17, 127} longer-term educational setbacks,^{17, 31} and negative impacts on the U.S. economy when educationally unprepared children become unprepared members of the labor force.^{17, 31} For adults, experiencing food insecurity can result in poor health status, leading to illness and development of chronic diseases, and can contribute to mental health issues such as depression. Adults experiencing food insecurity may be less prepared for a competitive workforce because of diminished development of human capital, lowered productivity, and more sick days. Seniors experiencing food insecurity may have accelerated declines in health and cognitive function and increases in chronic disease development.¹²⁸ Poor health status can increase health care utilization¹²⁹ (and thus, potentially increase costs to Medicare and Medicaid) and can further stress an already burdened health care system. Over the course of a lifetime, health and developmental consequences can accumulate and food insecurity can lead to lower lifetime earnings.¹³⁰ This section describes the consequences of food insecurity across the lifespan; some of the important consequences that we identified in the research include

- *Studies have shown that poor maternal nutrition during food-insecure times can lead to a reduced intake of micronutrients, such as calcium, iron, and folate, which are important for fetal development*
- *Children in food-insecure households are more likely to experience risk of hospitalization, iron deficiency anemia, decreased bone mineral content in boys, and overall fair/poor health*
- *Children experiencing hunger in kindergarten had lower test scores in reading and math by third grade*
- *Once food-insecure children reach school age, studies have shown that they struggle with mental health issues, lower cognitive development, challenges with peer interactions, and lower grades*
- *Individuals that experience chronic food insecurity have higher prevalence of diabetes, increased inflammation, and cardiovascular disease and higher odds of being obese*
- *In part because of lower and inadequate nutrient intakes, food insecure older adults and seniors, especially those with poor health, can experience declines in health*
- *Shepard et al.¹³¹ estimated that "hunger costs our nation at least \$167.5 billion due to the combination of lost productivity per year, more expensive public education because of the*

rising costs of poor education outcomes, avoidable health care costs, and the cost of charity to keep families fed”

- *Food insecurity can increase educational costs because food-insecure children are more likely to receive special educational services, nearly doubling the education costs relative to children without special needs*
- *Health conditions associated with food insecurity can translate into limited labor force participation and more absenteeism, presenteeism, and turnover—all of which are costly for the employer.*

3.1 HEALTH, DEVELOPMENTAL, AND EDUCATIONAL CONSEQUENCES OF FOOD INSECURITY IN CHILDREN

Children are an especially important population to focus on in preventing food insecurity because their experiences with food insecurity can have lasting effects on their future development, and on national prosperity. Food insecurity can affect child outcomes through multiple pathways¹³² including household composition (e.g., single parent households), maternal characteristics (e.g., maternal health), and environmental factors. In this section, we explore the effects of food insecurity on both pre- and postpartum development, as well as associations with future child health outcomes.

3.1.1 PRENATAL EFFECTS OF FOOD INSECURITY

Food insecurity—and the stress¹³³ associated with food insecurity—can have serious implications on the health and development of a child, even prior to birth. Several studies have shown that poor maternal nutrition during food-insecure times can lead to a reduced intake of micronutrients, such as calcium, iron, and folate that are critical for normal fetal development.^{127, 134} Reductions in important nutrients and caloric intake are associated with negative pregnancy outcomes including, for example, elevated risk of fetal growth retardation, preterm birth, and low birth weight.¹²⁷ Although less common, more serious effects linked with poor prenatal nutrition of important micronutrients include neural tube defects and heart defects.¹³⁵

Critical and sensitive stages of brain growth occur prenatally, and can influence the trajectory of a child's human capital development throughout their life. The first three years of life are the most critical for development of sensory capacity and language, both of which are crucial to development of learning capacity, and to laying down the foundation on which education attainment and other human capital formation are built. Through nutritional and non-nutritional pathways, food insecurity can be part of several forms of toxic stress that literally damage the architecture of a child's developing brain. That damage can handicap the child for life, reducing its learning capacity, hampering its school readiness, reducing academic

achievement and lowering educational attainment. Those impacts can profoundly limit a child's preparation for adult functioning, workforce preparedness, and life-time earnings.

Preterm birth can also affect the employment behavior of the parents. According to Cook et al.,¹³⁰ mothers of preterm or low weight babies reduce their employment by taking longer maternity leave, working fewer hours, or leaving the workforce.¹³⁰ A family's income can be reduced by as much as 32% because of these employment changes, which is disproportionately felt by low-income families who are more likely to have a preterm birth or low birth weight baby.¹³⁰



3.1.2 HEALTH, BEHAVIORAL, AND DEVELOPMENTAL EFFECTS OF FOOD INSECURITY ON CHILDREN

The effects of poor prenatal nutrition associated with food insecurity do not end once a child is born. Food insecurity among very young children is especially troubling because it undermines key developmental milestones and has long-term health and development impacts that continue into adolescence and adulthood.¹⁴ A large body of research has been conducted on the effects of preterm and low birth weight pregnancies on future development. These children are at a higher risk for chronic diseases later in life, including obesity, diabetes, and cardiac disease.¹²⁷ Perez-Escamilla et al. (2012)¹³⁶ proposed that the effects of food insecurity are a combination of biological effects of insufficient amounts of food and the psychological stress of not having enough food, which can create turmoil within the household. The interactions between physiological and psychological stressors create a challenging environment for a developing child.

Children with insufficient food intake are also more likely to consume insufficient nutrients for optimal health.¹³⁷ Studies have shown that children in food-insecure households are more likely to experience risk of hospitalization,¹³⁸ iron deficiency anemia,^{130, 138} decreased bone mineral content in boys,¹³⁹ and overall fair/poor health.¹³⁰ Persistent food insecurity may be particularly harmful; experiencing multiple periods of food insecurity during elementary school years is associated with poorer health among older children.¹⁴⁰

The health effects experienced by children living in food insecure households contribute to an increased risk for developmental delays in cognitive and mental health,¹⁴¹ and these developmental delays occur before children enter school, putting them at a disadvantage among their peers.¹⁴² Children experiencing hunger in kindergarten had lower test scores in reading and math by third grade.¹⁴³ Not only is food insecurity associated with persistent attention deficit hyperactivity disorder (ADHD) in children,¹⁴⁴ but childhood hunger and food insecurity also contribute to health problems in adolescence. Adolescents who have experienced childhood hunger or food insecurity have a greater likelihood for mood, anxiety, and behavior disorders, including depression and suicide ideation, and increased likelihood of substance abuse in adolescence.^{145, 146}



From a mental health standpoint, a longitudinal study of Canadian children from birth through 8 years found that persistent hyperactivity/inattention was positively associated with children in food-insecure household settings.¹⁴⁴ Socially, preschool children that experience food insecurity may have more trouble with aggression, anxiety, or even depression,^{127, 142} and these difficulties may continue all the way through high school, ultimately hurting the child's chances

of graduating.¹⁷ Overall, the challenges associated with food security can seriously handicap children as they move through the school system.

3.2 HEALTH CONSEQUENCES OF FOOD INSECURITY IN ADULTS

Food insecurity can have profound consequences on health in adults. Food insecurity is linked to poor health status, including poor overall health status, obesity and weight gain, chronic disease (e.g., diabetes, cardiovascular disease), and mental health challenges. Conditions associated with food insecurity or very low food security among adults and seniors include: overall poor or fair health,¹⁴⁷ obesity and weight gain,¹⁴⁸ diabetes and poor glycemic control,^{147, 149} dyslipidemia,^{150, 151} poor low-density lipoprotein control,¹⁵⁰ higher predicted risk of cardiovascular disease,¹⁵² high blood pressure,¹⁴⁷ increased levels of C-reactive protein (an indicator of inflammation and chronic disease development),^{152, 153} depression,^{147, 154} limited ability to perform activities of daily living,¹⁴⁷ congestive heart failure,¹⁴⁷ heart attack,¹⁴⁷ gum disease, asthma,¹⁴⁷ cognitive decline.¹²⁸ As discussed in the Section 2, the relationship between food insecurity and health status is often bidirectional: food insecurity can lead to poor health; poor health can contribute to food insecurity.

Food insecurity among seniors represents a significant public health threat (and potential costs to the health care system) because seniors are more vulnerable to health problems than other healthy adults; thus, persistent and episodic food shortages may more easily lead to health challenges, which can, in turn, reinforce food insecurity.⁹⁴ In older adults, food insecurity is linked to poor health, chronic health conditions, lower cognitive function, poor mental health, lower immune response, reduced physical activity, increased physical impairment, greater use of the health care system, and premature institutionalization.^{94, 147, 155, 156}

Increased stress arising from food insecurity also contributes to poor physical and mental health outcomes.^{52, 157, 158} As Hadley¹⁵⁴ explains, “Insecure access to food generates stress because of the social and biological value of food, and stress in turn increases the likelihood of developing common mental disorders” (p. 86). Furthermore, stress can encourage people experiencing food insecurity to seek out and consume nutritionally deficient, energy-dense foods (i.e., comfort foods).¹⁵⁹ The stressful life explanation also indicates that stress hinders metabolism, thus increasing body fat¹⁵⁹ and exacerbating chronic conditions.^{149, 157} Managing chronic conditions can be stressful on its own,¹⁶⁰ but individuals dealing with stress arising from food insecurity may have more difficulty taking care of their health and adhering to medical advice.^{161, 162} For example, individuals experiencing food insecurity that have diabetes generally report lower levels of self-efficacy for disease management. One study that examined the relationships among housing insecurity, food insecurity, and diabetes self-management demonstrated that housing security and food insecurity jointly reduced individuals’ confidence in and ability to manage their diabetes.¹⁶¹ Moreover, poor disease management can contribute to mental health problems (e.g., depression), which, in turn, negatively affects food insecurity.¹⁶⁰



We identified a number of studies intended to explain the complex relationship between poor health status and food insecurity. For example, one study suggests that because food-insecure individuals often lack financial resources to purchase higher cost healthy foods, they purchase and consume lower cost, nutritionally deficient (e.g., higher calorie and fat content with few micronutrients) foods that lead to weight gain.¹⁴⁸ Over time, gaining weight can lead to other health conditions, such as obesity, diabetes, and cardiovascular disease. Other studies suggest that coping strategies that evolve during periods of food scarcity may seriously disrupt metabolism and increase body fat.¹⁶² Specifically, individuals may overeat when food is available but miss meals or restrict intake when food is unavailable.¹⁶² For persons with diabetes, this cycle of over/under-eating leads to alternating periods of hyper- and hypoglycemia,¹⁶² and can contribute to increased use of the health care system for their condition.^{129, 162}

3.3 ECONOMIC CONSEQUENCES

Food insecurity imposes both direct (e.g., food assistance programs; health care) and indirect costs (e.g., worker absenteeism) on society.¹⁴³ Updating a 2007 report that estimated \$125.5 billion in hunger costs to the United States, Shepard et al.¹³¹ estimated that “hunger costs our nation at least \$167.5 billion due to the combination of lost productivity per year, more expensive public education because of the rising costs of poor education outcomes, avoidable health care costs, and the cost of charity to keep families fed” (p. 1). That estimate, which does

not include the \$94 billion costs of federal nutrition programs, identifies \$17.8 billion from charity costs (up from \$13.2 billion in 2007), \$130.5 billion from costs of physical and mental/psychosocial illness (up from \$98.4 billion in 2007), and \$19.2 billion (up from \$13.9 billion in 2007) from poor educational outcomes and lower lifetime earnings.^{131, 163}



Food insecurity can also increase educational costs because food-insecure children are more likely to receive special educational services.¹⁴³ The U.S. Department of Education estimates that special education cost an extra \$5,918 per student in 1999 to 2000. This extra expense nearly doubles the cost to educate a special needs child compared with the average cost of public education for a child without special needs in 2001 (\$6,800). Additionally, children typically continue to receive special needs education for the rest of their time in the school system.^{130, 143}

3.3.1 WORKFORCE CONSEQUENCES

Identifying and calculating workforce costs associated with food insecurity is not well studied in the literature. Nevertheless, missed work and poor job performance can diminish the financial situation of individuals and households experiencing food insecurity. For individuals, wage losses from missed work can reduce income and the ability to purchase food, potentially tipping a household from food secure, to food insecure, to very low food security. Food insecurity can also present financial and workforce challenges to employers. Employers may lose valuable employees to absenteeism due to direct impacts on an employee's physical or mental health^{130, 164, 165} caused by inadequate nutrition, or from indirect impacts on parents that take additional sick days to care for food-insecure children or seniors.¹³⁰ Employers may lose workplace productivity (i.e., presenteeism, or working less effectively when at work) as parents, especially mothers, forgo eating as a coping strategy to respond to the lack of food security for their

children.^{148, 166} Lastly, employers may experience burnout of employees that “cover” for food insecure absentees, as well as costs associated with turnover, recruitment, and training of new personnel. Food insecurity in childhood is linked to greater absenteeism and turnover in adulthood, both of which are costly to employers.¹³⁰ The 2005 CCH Unscheduled Absence Survey found that large employers can lose approximately \$660 per employee per year when employees are absent from work or are less productive on the job.¹⁷ Thus, food insecurity can create problems for individual employees and employers and for the U.S. economy more generally.



3.3.2 HEALTH CARE AND HEALTH-RELATED COSTS

The preponderance of evidence suggests that food insecurity represents a significant health issue for millions of Americans. The adverse health outcomes described above can contribute substantially to health care costs, especially for safety net health programs. Because food-insecure children are likely to be in households at or below the federal poverty level (FPL), the health care for these children may accrue to Medicaid or Children’s Health Insurance Program (CHIP). Food-insecure seniors experience poorer health and more chronic conditions than their food-secure counterparts, which has the potential to increase costs for Medicare.

Despite what appears to be an obvious relationship among food insecurity, poor health outcomes, and health care costs, we found no research that estimates the overall costs of food insecurity to Medicaid and Medicare. Nevertheless, food insecurity is associated with preventable, chronic conditions (e.g., diabetes, hypertension, heart disease) that are covered under Medicaid and Medicare, and these conditions have been shown to be increasing over the past two decades.¹⁷ A few studies have found that food insecurity is associated with avoidable health care costs, including greater risks of hospitalization and ED utilization.^{162, 167} One study

found food insecure adults with diabetes have five more physician encounters per year than food-secure adults with diabetes.¹⁶²



As discussed above, food insecurity during pregnancy can lead to negative health outcomes such as low birth weight and preterm birth. The average aggregate cost of caring for a very low birth weight infant over the first year of life was approximately \$60,000.¹³⁰ Moreover, being born with low birth weight and experiencing food insecurity during childhood can increase risks of obesity. Health care costs for U.S. children 6 to 17 years old for obesity-related disease management was estimated to be \$127 million in 2003 because of rising rates of overweight and obese children in this age group¹³⁰; another study calculated that direct costs for childhood obesity (e.g., additional outpatient visits, emergency department use, and prescription drugs) reached \$14.1 billion in 2005. Regardless of the quality of prenatal care, food-insecure children are more likely to be hospitalized than children who do not experience food insecurity, with an average pediatric hospitalization costs nearly \$12,000.¹³⁰

Thus, the consequence of higher levels of health care utilization associated with food insecurity, especially for avoidable costs, is to drive up the costs of our federal programs.

4 RESPONSES TO FOOD INSECURITY AND HUNGER

Recognizing the burden of food insecurity on individuals, households, and society, Congress began developing a national nutritional "safety net" just after World War II. Today 15 programs form this country's nutritional safety net. In addition, other public financial and targeted assistance programs contribute resources that households use to extend their food purchases. Supplementing these programs is a large network of private charitable food providers that distribute food to needy households through emergency and nonemergency programs such as food pantries, soup kitchens, shelters, and targeted senior and school programs. In addition, families use a variety of food acquisition coping strategies in place of, or as a supplement to, the nutritional "safety net" programs. Yet, despite safety net and coping strategies, food insecurity remains a problem for millions of U.S. households. In this section, we present a collection of innovative programmatic strategies described in the literature between 2008 and present that are designed to ameliorate food insecurity. We describes several innovative strategies developed through different programs such as the

- *Innovative strategies used in the Supplemental Nutrition Assistance Program (SNAP) include expanding eligibility, increasing benefits, revising asset rules and performing outreach activities*
- *Innovative strategies used in child-focused programs include expanding eligibility in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), simplifying the application process for school meals, expanding eligibility for school meals, increasing availability of school breakfast, offering universal-free breakfast, and enhancing summer food benefits*
- *Innovative strategies used by private food providers include creating resource hubs to integrate services and placing food pantries in schools*
- *Innovative strategies used in the food environment include conducting community assessments, promoting community supported agriculture, locating supermarkets in low SES neighborhoods, and providing nutrition and financial management education.*

4.1 INTRODUCTION TO RESPONSES TO FOOD INSECURITY

In 1946, after an investigation revealed a connection between physical deficiencies and childhood malnutrition in young men rejected in the draft, the National School Lunch Program (NSLP) was established as a "measure of national security, to safeguard the health and well-being of the Nation's children."³ This program was followed by the creation of other programs designed to alleviate food insecurity, especially among children. In 1964, enacting legislation

for SNAP (formerly Food Stamps) stated that it was necessary "... to safeguard the health and well-being of the Nation's population and raise levels of nutrition among low-income households."¹⁶⁸ Similarly, the Child Nutrition Act of 1966 aimed "... to meet more effectively the nutritional needs of our children,"³ recognizing "the demonstrated relationship between food and good nutrition and the capacity of children to develop and learn." This Act and successor legislation ultimately set up and further strengthened nutritional "safety net" programs, including the School Breakfast programs, the Child and Adult Care Food program, the Summer Food Service program, the Special Milk program, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and the WIC Farmers' Market Nutrition Program. In addition, other financial and targeted assistance programs (e.g., housing, medical, and energy assistance; income tax credits) can make household-level resources available for food purchases. These federal nutrition assistance programs have continued to expand to meet some households' food needs.



Supplementing these public programs is a large network of private charitable food providers that distribute food to needy households through emergency and nonemergency programs such as food pantries, soup kitchens, shelters, mobile distribution facilities and targeted senior and school programs. Although these charitable programs rely primarily on donations, they are also federally supported through donations of food and administrative funds from The Emergency Food Assistance Program (TEFAP) program, administered by USDA. In 2013, over

\$600 million in funding and surplus foods was distributed to emergency food providers through this program.¹⁶⁹

Considering this suite of public and private assistance programs, one might expect that food insecurity would not be a widespread problem in the United States. Yet, despite the contribution of these “safety net” programs, food insecurity remains a problem for many U.S. households. To further understand the continued high rates of food insecurity, given the “safety net” programs, researchers examined two primary kinds of explanations: 1) economic factors that affect family resources (e.g. employment, income, assets and liquidity constraints) and 2) factors that lead many eligible households not to participate in the “safety net”.

In this section, we present a collection of innovative programmatic strategies to strengthen food security that have been described in the literature between 2008 and present. We sorted the strategies into three broad categories: (1) innovations to federal food and nutrition assistance programs, (2) innovations in the emergency food system, and (3) innovations in the food environment. Below, we provide an overview of each area, and discuss several promising strategies that have emerged from our review of the literature.

4.2 FEDERAL FOOD AND NUTRITION ASSISTANCE PROGRAMS

Federal food assistance programs are intended to assist low income households by either the direct provision of food, or provision of resources specifically for acquiring food. These programs are part of a broader safety net that also includes financial assistance programs. These safety net programs have the potential to improve food security by either providing food directly or increasing the ability of households to afford a stable food supply. The programs vary by size, type of benefits provided, and target population; taken together, they form a nutritional safety net for millions of low-income children and adults. For example, WIC and SNAP directly provide food or food purchasing power, and other programs supplement household income through cash benefits or tax credits (e.g., TANF); subsidized housing (through rent subsidies and development of low-rent units); child care (Head Start, child care subsidies, and CACFP), and health care (Medicaid, CHIP). In theory, food benefits free up income for other expenditures and can offset, completely or partially the expenses for food. Of course, non-food benefits may also free up income for food and other expenses.

Although the programs are federally funded and require Congressional authorization and appropriations, most are implemented by state agencies that involve set state-specific conditions on eligibility and benefit levels. The programs are “means tested” in the sense that individuals that apply for benefits must establish income eligibility according to program-specific guidelines, which include limits on assets such as retirement savings and vehicles. In general, there is a natural tension between promoting accessibility to all individuals that are eligible while, at the same time, trying to constrain cost. Because our review did not identify any financial assistance programs using food security as an outcome measure, we focus here on strategies used in feeding assistance safety net programs. The scope of this report did not

support the evaluation of programs; nevertheless, the following discussion provides substantial insight into feeding assistance safety net programs.

4.2.1 FEEDING ASSISTANCE SAFETY NET PROGRAMS

Roughly 1 in 4 Americans participates in at least 1 of the USDA’s 15 domestic food and nutrition assistance programs at some time each year. These programs account for over 70 percent of USDA’s annual budget.⁶³ Moreover, over a typical 4-month period during and immediately after the Great Recession, 44% of school-aged children were in households that participated in at least one of the 3 main safety net programs (SNAP, School Breakfast Program, National School Lunch Program).¹⁷⁰ Table 4-1 summarizes the major nutritional safety net programs in the U.S.

Table 4-1. Select Nutritional Safety Net Programs, Eligibility Standards and Participation Rates

Program	Description	Eligibility	Participation
Supplemental Nutrition Assistance Program (SNAP)	Formerly called the Food Stamp Program, SNAP is a program that provides eligible families with funds, delivered digitally in the same way as debit cards, to purchase food. SNAP’s aims are to alleviate hunger and improve the nutrition and health of low-income people.	Most households with gross income less than 130 percent of the federal poverty level (FPL); other income, asset, and cost-of-living criteria are also used. Alternatively, households may qualify if some or all members participate in TANF or SSI, or general assistance. Available to noncitizen children, if they are qualified aliens, but not to undocumented noncitizens.	47.6 million people participated in FY2013 ²⁶
Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)	WIC provides federal grants to states for providing supplemental, nutrient-rich foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and nonbreastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk. In most states participants also receive vouchers through WIC’s Farmers’ Market Nutrition Program.	Households with income at or below 185 percent of the FPL with a child age zero to five and a pregnant or postpartum woman. Children become ineligible on the day of their fifth birthday.	8.7 million women, infants, and children participated in FY2013 ²⁴

(continued)

Table 4-1. Select Nutritional Safety Net Programs, Eligibility Standards and Participation Rates (continued)

Program	Description	Eligibility	Participation
School Meals	This umbrella term includes several federally assisted meal programs: the National School Lunch Program (NSLP), the School Breakfast Program, the Fresh Fruit and Vegetable Program providing fresh produce to selected low-income elementary schools, and the Special Milk Program for children without access to other meal programs. The goals of these programs are to prevent hunger and to promote healthy eating.	Children are eligible for free meals under the NSLP and SBP if household income is less than 130 percent of FPL. They qualify for a sharply reduced price (\$0.40 for lunch; \$0.30 for breakfast) meal if household income is between 130 percent and 185 percent of the FPL. Students can be categorically eligible if they or household member participates in SNAP, TANF or FDPIR. Noncitizens meeting eligibility may participate.	30.7 million children participated in the NSLP and 13.2 million children participated in the School Breakfast Program in FY2013 ¹⁷¹
Summer Food Service Program (SFSP)	The SFSP was established to ensure that low-income children continue to receive nutritious meals when school is not in session. As a federally-funded, state-administered program, SFSP provides free, nutritious meals and snacks to help children in low-income areas get the nutrition they need throughout the summer months. (2)	No income requirements; all children eighteen and younger and adults who are in a school programs because of a mental or physical disability are eligible.	2.4 million children served daily during July 2013 ²⁴
Child and Adult Care Food Program (CACFP)	CACFP provides nutritious foods to children in day care, emergency shelters, and after-school care programs, and to adults in nonresidential adult day care centers, as well as family or group day care homes. CACFP aims to improve wellness, healthy growth, and development of young children, and the health and wellness of older adults and chronically impaired disabled persons.	Based on population served by facility; varies by type of facility.	3.3 million children and 120,000 adults served daily ²⁴

(continued)

Table 4-1. Select Nutritional Safety Net Programs, Eligibility Standards and Participation Rates (continued)

Program	Description	Eligibility	Participation
Food Distribution	The food distribution programs strengthen the nutrition safety net through the distribution of foods and other nutrition assistance to children, low-income families, emergency feeding programs, Indian reservations, and the elderly. Direct food distribution goes through the Schools/Child Nutrition Commodity Programs, the Food Distribution Program on Indian Reservations, Commodity Supplemental Food Program, and the Emergency Food Assistance Program.	Criteria vary based on program.	N/A

4.2.2 SNAP

SNAP is largest nutrition assistance program aimed at reducing food security. Over the past two decades, there has been a shift in the benefits package received by households receiving SNAP, with fewer households receiving both food and financial assistance, and more households receiving only food assistance.¹⁷² Currently, SNAP is the most widely available source of government-provided nutrition support to low-income households. Recipient households rely on SNAP to ensure that they have resources to purchase food and protect their food consumption, freeing up resources that can be used to bridge other budget gaps.¹⁷³ Even though SNAP helps ease the impact of food expenses exceeding available income, recipients often report that a gap remains.^{118, 174} In a large qualitative study of SNAP households with children conducted recently, a respondent summarized how her family cobbles together financial resources to purchase food. Even after combining out of pocket cash, SNAP benefits, disability payments, life insurance policy payout, the respondent reports, they still use informal, individual food acquisition strategies to address remaining gaps in the food budget.

“We pull together. My grandma, she spends out of her pocket to get food and my mom will spend out of her pocket to go get food. Me, I spend out of my pocket [or use SNAP] to go get food and we’ll be like “Oh, what are we going to eat today?” We’ll come home with it and then if we completely don’t have money, me and my sister will go give plasma so we have money to get food.”^{118, 174}

Even so, multiple studies indicate SNAP reduces household food insecurity.^{173, 175-178} For example, a recent national study of 3,000 households showed that children in households newly

approved for SNAP but not receiving it were 36-38% more likely to be food insecure than children who participated in SNAP for 6 months.¹⁷⁹

Our review of the literature uncovered four primary types of programmatic strategies that are utilized to ameliorate food insecurity using SNAP or to increase SNAP participation. Increasing SNAP participation has, itself, been connected to improved food security—expanding eligibility, increasing benefits, revising asset rules, and performing outreach activities. Examples of each type of strategy are described briefly below.

Expanding eligibility. A substantial body of research has examined innovations in SNAP designed to increase participation and improve food security status. Although the concept of increasing enrollment by reducing eligibility barriers seems almost simplistic, state and federal policies for SNAP can drive differential rates of participation and food insecurity^{176, 180} and there is considerable variation in SNAP eligibility rules across states.

Federal policies restrict immigrants' eligibility for SNAP. Some states have filled this gap by providing SNAP-like benefits to immigrants who are ineligible for SNAP. An analysis of immigrant households not otherwise eligible for SNAP participation in the SNAP expansion following the Great Recession (2003-2010), showed that among immigrant households food insecurity rose significantly more than in non-immigrant households during the downturn. These immigrant households were more likely to utilize and receive the SNAP-like benefits in states that expanded eligibility. Being eligible for SNAP-like benefits was associated with lower food insecurity among these immigrant households.¹⁸¹

Increasing benefits. Higher SNAP benefit amounts have been associated with lower likelihood of food insecurity.^{173, 182, 183} For instance, a \$10 per person increase in SNAP benefits was associated with a 12 percent reduction in the odds of a household being food insecure.^{173, 182, 183} As part of The American Recovery and Reinvestment Act of 2009 (ARRA)¹⁸⁴ the national stimulus package, SNAP benefits increased by 13.6% in April 2009. Multiple reports evaluating the effects of the SNAP benefit increases found that they were associated with reductions in food insecurity.^{182, 183} One such report showed that food security of SNAP-eligible households improved from 2008 to 2009, whereas during that same period, food security did not improve for those households just above the income threshold for SNAP.¹⁸³

Revising asset rules. Many states have asset rules that determine SNAP eligibility, meaning that participation is limited to individuals or households with few or no assets. If individuals or households have assets exceeding the state's limit, the individual or household must "spend down" the assets before qualifying for the program. Using a microsimulation model, researchers assessed (1) the effect of changes to state-level SNAP asset rules on household eligibility and (2) the benefits that eligible households would receive. Model findings indicated that the number of households eligible for SNAP would increase by about 3 percent if asset limits were raised by \$2,000, by 22 percent if the asset test were eliminated, by 2 percent if retirement accounts were excluded, and by less than half of 1 percent if all vehicles were

excluded. Eligibility across states varied widely, with 32 percent of households eligible in at least one state but not eligible in all states.¹⁸⁵

Performing outreach activities. Outreach has been shown to be an important determinant of SNAP participation. In 2004, USDA began a large-scale advertising campaign to increase participation in SNAP by increasing awareness about the program. In a national sample, radio advertisements were shown to be positively correlated with SNAP participation rates.¹⁸⁶ In a second study, researchers in California used a public-private partnership to increase SNAP participation, leveraging access to client financial data as well as skills in meeting with clients face to face.¹⁸⁷ Randomized experiments conducted in H&R Block franchises showed that eligible households are more likely to apply for SNAP benefits if (1) the outreach approach reduces potential participants' preconceptions of stigma associated with program enrollment,¹⁸⁷ and (2) they receive help filling out the application form.

Additional outreach efforts have targeted specific types of populations. For example, six states conducted demonstration projects intended to facilitate SNAP access among the elderly and working poor. Outreach strategies included marketing SNAP using print and media materials, collaborating with community organizations and employers to share information about SNAP, and providing application assistance. Although no states showed a statistically significant increase in the numbers of applications processed following the demonstration period, two states targeting elderly did show increased SNAP participation numbers. However, the two states with improved participation rates supplemented their outreach efforts with a simplified SNAP application process, and focused on participants that they perceived would be likely to be eligible based on participation in other benefit programs.¹⁸⁸ In addition to simplifying the application process (e.g., using digital means), the potential use of online food assistance applications has received attention; some evidence indicates it may be preferable to face to face application processes among subpopulations with internet skills and access.¹⁸⁹

4.2.3 CHILD-FOCUSED PROGRAMS

As discussed in Section 3 on the Consequences of Food Insecurity, it is especially critical that children meet their nutritional requirements. Below, we discuss programmatic strategies for reducing food security or increasing enrolment in four of the USDA's child nutrition programs: (1) WIC, (2) School Breakfast Program (SBP), (3) National School Lunch Program (NSLP), and (4) Summer Food Service Program (SFSP).

The WIC program is considered a crucial component of the social safety net in the U.S., supporting the nutritional well-being of pregnant, breastfeeding and non-breastfeeding postpartum women and infants and young children. Currently WIC serves more than half of all infants born in the U.S.¹⁹⁰

The federal school nutrition programs increase access to nutritious meals and snacks among school-age children and youth. Operated by public school districts and nonprofit private schools, school-based nutrition programs such as the SBP and NSLP have been shown to

significantly reduce the odds of child food insecurity.¹⁹¹ For families that rely on free or reduced-price lunch or breakfast, summer can mean the loss of 10 meals per week per child.

Expanding eligibility in WIC. Analysis of national survey data has shown that WIC reduces the prevalence of child food insecurity and very low food security.¹⁹² Children are eligible for the WIC program until the day before they turn 61 months old. Nationally, a sizable increase in household food insecurity occurs at the 61 month cutoff.¹⁹³ Thus, increasing the age cut off for eligibility could improve household food security.

Simplifying the application process for school meals. All children living in households receiving SNAP or FDPIR benefits or TANF cash assistance benefits can bypass the standard application process and be “directly certified” for free school meals. Using direct certification to determine program eligibility eliminates paper applications by relying on automatic data-matching procedures to identify children who qualify for free school meals via categorical eligibility. Compared to paper applications, direct certification appears to increase the percentage of children certified for free school meals.¹⁹⁴

Expanding eligibility for school meals. The Community Eligibility Option (CEO) for school breakfast and lunch, introduced in the Healthy, Hunger-Free Kids Act of 2010, allows schools in high poverty areas to offer meals through the SBP and NSLP to all students at no charge. Paper-based applications are eliminated with participation in the school meals program tied to direct certification rates of over 40% of students. Schools are reimbursed according to the number of “identified students,” defined as those certified without application for free school meals because they are in foster care or Head Start, are homeless, migrant or living in households that receive SNAP or FDIR benefits or TANF cash assistance. Thus, schools with a high percentage of students who are eligible for the free meal program through direct certification can provide free meals to all students enrolled in the school. The CEO program is being phased in state by state, with full implementation across the country planned for the 2014-2015 school year. Early findings indicate growth in low-income student participation especially in the School Breakfast Program.^{195, 196}

Increasing availability of school breakfast. In Vermont, children provided with breakfast resulted in marked increase in the number of low income children eating breakfast; after the start of the program, participants were just as likely to eat breakfast as their nonparticipating peers.¹⁹⁷ Increasing the availability of school breakfast may be an effective strategy for maintaining food security in low income households with elementary school children, although it may not remedy food insecurity after it has occurred.¹⁹⁸

Offering universal-free breakfast. By encouraging low income schools to (1) offer universal school breakfast and (2) incorporate school breakfast meal time into the school day, districts across New York State have successfully increased the availability of, and participation in, the school breakfast program.¹⁹⁹ In 2007-2008, Guilford County Schools (GCS) in North Carolina offered universal free breakfasts in their School Breakfast Programs (SBPs) in 26 schools. In

2008-09, the GCS changed to eligibility-based SBPs at several schools, while adding a universal-free SBP at one school. As might be expected, SBP participation fell at the schools that lost universal-free SBPs, and grew at the school that gained a universal-free SBP.²⁰⁰ Qualitative research shows that greater participation may occur in universal-free school breakfast programs if students are involved in menu planning, taste testing potential foods, and selection of the setting for the meals. In addition, environmental modifications may reduce social stigma associated with receipt of the free meals.²⁰¹

Enhancing summer food benefits. The SFSP has only achieved a fraction of the level of program participation reached by the school meals programs during the school year. In 2012, only 3.3 million children received meals in July compared with approximately 21.5 million children who received free or reduced price NSLP lunches each day.²⁰² To ameliorate the effects of seasonal volatility in child food security associated with loss of school meals, USDA implemented the Summer Food for Children Demonstrations. These demonstrations were intended to develop and test alternative methods of providing access to food for low-income children in urban and rural areas during the summer months when schools are not in regular session. Strategies tested to improve food security included rural meal delivery and take-home backpacks to address areas where (1) there are not sufficient children to cost-effectively operate programs, and (2) the sites are not open during all days of the week. Results from the analysis of the relationship between the meal delivery and backpack demonstrations and levels of adult, child, and household food security suggest that the two strategies may have helped decrease the prevalence of food insecurity in the summer. Preliminary results of the random assignment design evaluation of the Summer Electronic Benefits Transfer for Children (SEBTC) indicate that providing an additional \$60 per child per month on an EBT card reduced very low food security among children by 33%. Further, the number of children reached by the SEBTC program exceeded the percentage of eligible children served with traditional summer feeding programs.²⁰²

4.3 PRIVATE FOOD ASSISTANCE SYSTEM

Private charitable food providers, commonly referred to as “emergency food providers” because they were initially formed to offer short term “emergency” food assistance to households, have recently been shown to be “chronically” accessed by their clients.²⁰³ Within this private food assistance system, food is provided as groceries through food pantries or hot meals at soup kitchens or shelters. The number of charitable food providers has dramatically increased over the past three decades. Access to food pantries has been shown to be related to improved food security in households with children and households with income at or above the poverty threshold.²⁰⁴ The Feeding America (FA) network is the largest group of food banks and food rescue organizations, with 200 members supporting 61,000 agencies. In the most recent reporting date (2010), FA distributed food to 37 million Americans, including 14 million children and 3 million seniors.²⁰⁵ Among all households served by the FA, 75% were food insecure, an increase from 70% in 2005.²⁰⁵ The food available to clients varies by location served, the organization’s resources, and the effectiveness of the local providers. On average,

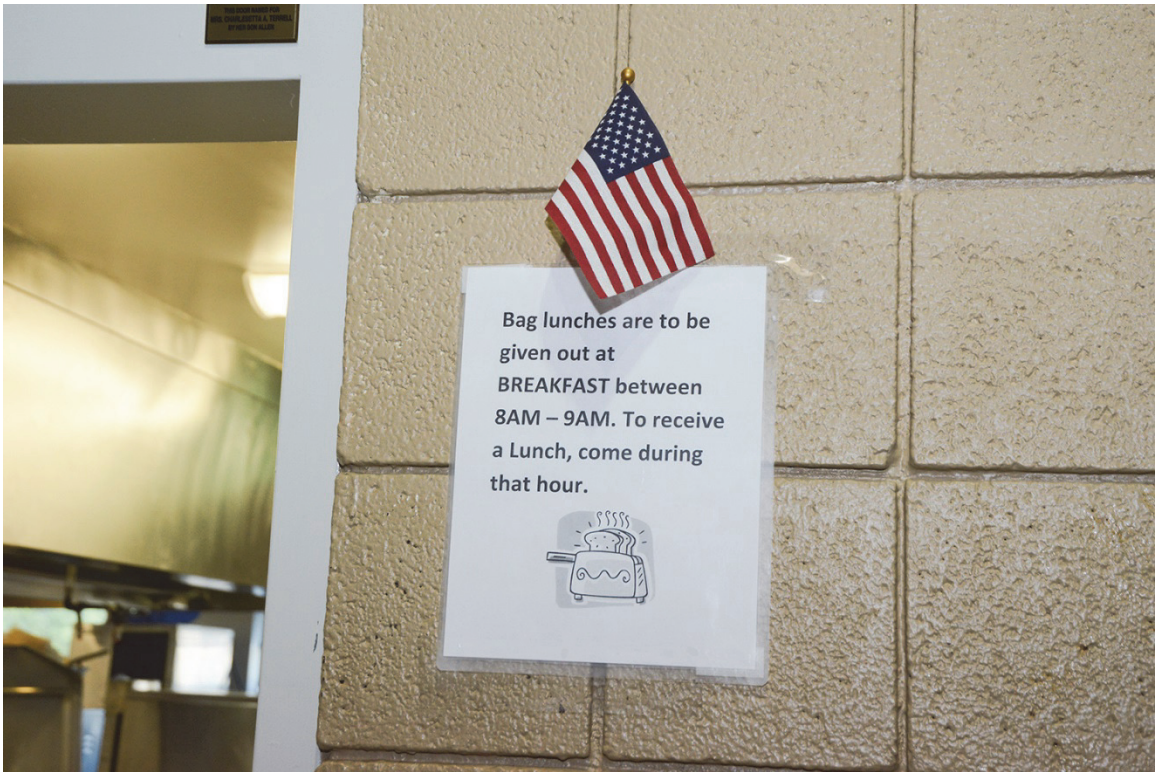
organizations report that the food provided at food pantries last for about three days.²⁰⁶ Over the course of a year, the monetary value of total food assistance can be more than \$2000 per household. Yet as with federal assistance programs, many low-income Americans do not access the private charitable network for the reasons described above (i.e., stigma, access challenges, transaction costs).



Within the landscape of private charitable food providers two innovative strategies for increasing food security stood out in the literature—food centers and school based food pantries.

Creating resource hubs: Within the private network, food centers work to integrate the necessary resources for achieving sufficient and nutritious food in a single organization. A randomized controlled trial of more than 200 clients of Freshplace, a food center in Hartford, CT, showed a significant improvement in food security over a three month period of those clients receiving a comprehensive intervention compared to clients limited to using a traditional pantry. The intervention group used a client-choice food pantry, participated in monthly meetings with a project manager to identify food security and self-sufficiency goals and monitor their progress, received access to resources to facilitate goals. The resources included cooking classes, computers for job searches, nutrition education and consultations with dietitians, and referrals to other financial and feeding assistance programs, like SNAP or energy assistance. The authors concluded that the Food Center model may serve as an example for promoting sustained food security by addressing the underlying causes of poverty. Additional

outcomes of note included increased consumption of fruits and vegetables and improved self-sufficiency.²⁰⁷



Placing food pantries in schools. Recognizing that a large number of individuals served by the charitable food provider network are children,^{205, 208, 209} the Food Bank of Delaware (FBD) implemented a School Food Pantry Program where at-risk families are able to access emergency food products at school-based sites. Program operation and support relies on a partnership between the food bank, schools and local organizations such as banks and community-based groups. Given the newness of this program, a formal program evaluation had not yet been conducted.

4.4 FOOD ENVIRONMENT

The food environment includes physical structures in the community such as food stores, restaurants, schools, and worksites. In considering the influence of the food environment on dietary behavior, the majority of research that we reviewed examined strategies intended to improve the quality of the diet (e.g. increase fruits and vegetables, replace higher fat dairy products with lower fat substitutes).²¹⁰⁻²¹³ Currently, limited research exists to determine whether changes to the food environment reduce food insecurity. Therefore, our short discussion of the food environment is focused on the nutritional and financial education efforts performed to help individuals better navigate their food environments in order to improve their food security. We begin by describing strategies intended to promote a food secure landscape, and then describe efforts used to help individuals better navigate their food environment.

Conducting community assessments. A community assessment performed on a Native American reservation in California identified specific barriers to healthy eating and food security that resulted in several changes in the food environment. Changes made to address causes of food insecurity included (1) integrating community-supported agriculture with the commodity foods program, (2) use of SNAP at farmers markets, and (3) providing culturally appropriate foods at farmers markets. Changes in food security were not reported.

Promoting community supported agriculture. Food insecurity is associated with poor produce intake. To understand if seasonal availability may be a barrier to intake, Fiorita et al.,²¹⁴ examined whether Community Supported Agriculture fresh produce delivery during a winter season could improve the food security status in a small sample of Appalachian households. Although food security was not improved, a minimal uptake in produce consumption was reported.

Supermarket location. Research has repeatedly demonstrated that access can be limited in low resource neighborhoods or rural areas because of (1) the absence of full service supermarkets that can reasonably be reached by local residents, and (2) the reduced variety of food sold in small retail outlets. The “food desert” concept has arisen from these observations. For example, in eastern North Carolina, rural participants reported frequent use of corner stores because of convenience, yet acknowledged that they did not purchase produce frequently because of low availability at these locales.²¹⁵ Research aimed at determining whether increasing food availability will improve food security, has been founded on this premise with mixed results. Bartfeld et al.¹¹² found that the proximity of supermarkets and grocery stores combined with access to transportation reduced food insecurity, while Kirkpatrick found food security rates were not associated with locations of food retailers or community food programs.²¹⁶

Sadler described results of an experiment that allowed the examination of impacts of a new supermarket on food security and food purchase patterns in a high risk neighborhood. In this instance, cross sectional pre-post data indicated no change in food security rates. Interestingly, the food insecure respondents tended to live closer to grocery stores and were twice as likely to shop at their nearest grocery store. Further, they acknowledge that Flint, Michigan, is a unique environment for a study of supermarket location given the proliferation of automobiles; the majority of respondents had access to a car.^{217, 218} The authors conclude that food security and dietary habits cannot be remedied by a single-focus approach, in this case, location of a supermarket. They suggest, instead, that some type of multi-pronged intervention that includes involving individuals in the food system such as through community gardening and promoting behavioral change program, is needed. The multi-pronged intervention should offset factors commonly present in distressed neighborhoods, such as unhealthy food options and grocery prices.^{10, 219}

4.4.1 EDUCATIONAL EFFORTS

Educational efforts to improve food security can concentrate on teaching meal planning, gardening, preparation of healthy meals and snacks, or financial management. Thus, education can target improving dietary intake as well as maximizing food resources. However, we identified few published articles or reports that assessed *food security* as an outcome of these programs. Similar to the results for the food environment landscape, the majority of studies focused on education efforts related to improving dietary intake of select nutrients or food groups (e.g., fruits and vegetables), or changes in attitudes and behaviors related to preparing foods.²²⁰

Nutrition education. Funding is available to states that opt to provide nutrition education to their SNAP participants (SNAP-Ed). In 2012, all states, the District of Columbia, and the Virgin Islands provide nutrition education for SNAP and other eligible low-income individuals. We found a single study evaluating these educational efforts on food security. Using a pre- and post-test design, a randomized experimental group in Indiana completed SNAP-Ed classes.²²¹ Following completion of the educational effort, food insecurity and food insufficiency in the experimental group were significantly improved relative to the control group, indicating that nutrition education can improve food security.²²²



Recognizing the potential to improve quality and quantity of low-income households' dietary intake, private charitable food providers have begun to offer nutrition education to clients as well. Flynn et al showed a six week cooking program at a food pantry significantly improved food security.²²³ A community based, participatory project among Hispanic farmworkers and

their families focused on creating organic gardens. Participants interviewed before and after the gardening season indicated reductions in food insecurity in addition to (1) better measures of dietary quality, and (2) perceived improvements in physical and mental health.²²⁴ Similarly, an exploratory assessment of home gardening showed that growing food contributes to food security at all income levels. The sustainability of household food sourcing and gardeners' overall health and well-being also increased with food production; however, the authors noted that gardening skills were a significant barrier to residential food production.²²⁵

Financial management. Low- and moderate-income households often face considerable difficulties in finding sufficient financial resources to support an adequate diet. Using a nationally representative sample, Fitzpatrick et al investigated the use of financial services and other financial decisions parents make that may affect the risk of food insecurity of their children. Fitzpatrick found low financial literacy and management skills among food insecure households, identifying a need for new efforts to educate low income populations on financial management.⁵⁹

5 SUGGESTED STRATEGIES FOR REDUCING AND PREVENTING FOOD INSECURITY IN THE U.S.

Existing evidence on causes of food insecurity in the U.S. overwhelmingly indicates that the main reason households are pushed into food insecurity is the lack of adequate financial resources. There are many reasons why households may lack adequate resources, and no single approach can resolve the problems of food insecurity. However, an approach that addresses multiple risk factors for food insecurity may help households that are trying to maintain food security to be successful, and help households that are currently in a food insecure situation to escape it. This section presents our recommendations for reducing and preventing food insecurity in the U.S. under three broad categories: (1) strategies to strengthen household economic security, (2) strategies to strengthen the public and private food, and (3) nutrition assistance systems. Highlights of these recommendations include

- *Improve economic security by encouraging lower-middle income employment and increased wages, improving the affordability of housing and health insurance and developing financial incentives specifically targeted to low income residents*
- *Maintain and strengthen federal food and nutrition assistance programs, providing more stable resources for families trying to provide a better life for themselves*
- *Promote collaborations both among and within public and private service providers*
- *Incentivize charitable donations*
- *Support nutrition and financial management education.*

5.1 STRENGTHENING HOUSEHOLD ECONOMIC SECURITY

As documented earlier in this report, low income is the strongest risk factor for food insecurity; in addition to low absolute levels of income, income shocks also play a role, as do competing expenses that make it challenging to meet food needs. Thus, among the most effective strategies to reduce food insecurity are those that support income adequacy and stability by raising incomes, reducing income volatility, and helping to limit other expenses. Broad approaches in this domain could include

- **Pursue strategies intended to raise wages of low-wage workers.** Higher wages encourage work, raise household incomes, and reduce the demands on means-tested cash and in-kind assistance programs.

- **Encourage state earned income tax credits (EITC) to supplement the federal credit.** The EITC raises incomes of working families, targets support on households at economic risk for food insecurity, and promotes employment. To claim the credit, a taxpayer must have earnings from a job. State earned income credits are an effective way to build on the federal EITC.
- **Ensure unemployment insurance benefits are available to unemployed workers, including the long-term unemployed.** Unemployment is consistently among the strongest risk factors for food insecurity; families experiencing long-term unemployment face extended periods of very low incomes, and depletion of assets.
- **Foster job growth.** Although a safety net for the unemployed is critical, the availability of jobs is likewise essential.
- **Ensure an adequate and accessible cash assistance safety net via TANF.** Households at highest risk for food insecurity include those that have historically had higher need for public assistance programs. When income from work is not sufficient to meet basic needs, or when work is not possible because of critical family challenges and/or a lack of available jobs, a well-functioning safety net helps maintain food security. Termination or reduction of TANF benefits has been linked with increased likelihood of food insecurity,²²⁶ and a more generous safety net is associated with lower risk of food insecurity among families with children.²²⁷
- **Improve affordability of housing and housing-related expenses.** Housing is the largest expense for most households and, as documented in this report, research links high housing costs as well as high energy costs to increased risk of food insecurity.²²⁸ A growing body of research suggests that the inability to maintain home temperatures within a healthy range (i.e., household energy insecurity) is associated with both food insecurity and adverse health outcomes in children and the elderly.⁸ Strategies to help limit the burden of housing costs would permit increased resources for food purchases. Strategies could include housing subsidies, affordable housing initiatives, energy assistance (e.g., the Low Income Home Energy Assistance Program, or LIHEAP), energy efficiency initiatives, and related efforts.
- **Strengthen access to affordable health insurance and healthcare.** Competing expenses can jeopardize the ability of households to meet their food needs. Higher out-of-pocket medical expenses have been linked to increased risk of food insecurity, suggesting that reducing health costs may improve food security outcomes.²²⁹
- **Provide enhanced access to short-term, low-cost credit, to help reduce income volatility and reduce reliance on harmful high-cost loans.** Recent research points to income and expenditure volatility as a challenge for low-income families; research also suggests that users of alternative financial services such as pawn loans and payday loans, as well as recently 'unbanked' households, are at high risk for child food hardships.^{59, 230}
- **Strengthen resource management skills.** Research suggests that financial management skills are linked to lower risk of food insecurity,⁵⁸ and some studies have found nutrition education can increase food security.²²²

5.2 STRENGTHENING THE FEDERAL FOOD AND NUTRITION ASSISTANCE PROGRAMS

The federal nutrition assistance programs are critical to household food security. Efforts to reduce food insecurity require maintaining and strengthening these programs, including SNAP, school meal programs, summer food service programs, WIC, the Child and Adult Care Food Program (CACFP), and The Emergency Food Assistance Program (TEFAP). Although this list is not exhaustive, we highlight a number of priorities supported by research:

- **Maintain support and funding for SNAP.** SNAP is the nation’s most important bulwark against food insecurity and hunger, and it is the most robust of all of our anti-poverty programs.²³¹ It is countercyclical, expanding to meet demand during economic downturns, and contracting when stronger economic performance reduces need. As described in Section 4, the preponderance of research suggests that SNAP—intended to supplement food budgets to ensure households can buy sufficient food to meet their basic needs—reduces the risk of food insecurity.²³²⁻²³⁴ In addition to fighting food insecurity directly, it is an effective economic stimulus, generating \$18 of economic output for each \$10 spent on SNAP, and leading to creation of approximately 17,900 full-time jobs for each \$1 billion of SNAP benefits.²³⁵
- **Bring SNAP benefits more in line with the best evidence on benefit adequacy.** A series of USDA reports provides strong evidence that the temporary benefit increases in ARRA were associated with a decline in child hunger, while the erosion of that increase was associated with a comparable rise in food insecurity (as food costs increased).^{236, 237} A recent report from the Institute of Medicine found that (1) the assumptions underlying the TFP, which is the basis for the SNAP benefit calculation, may be inconsistent with the time demands of low income households, and (2) the adequacy of benefits likely varies according to a range of individual, household, and environmental factors.⁵⁶
- **Avoid SNAP restrictions that penalize persons unable to find work.** Since 1996, SNAP has required able-bodied adults without dependents (ABAWDs) to either work or engage in qualified work-related activities for 20 hours per week; those who fail to meet these requirements are limited to three months of SNAP benefits in a three-year period. There are exceptions in certain high-unemployment areas, and the requirements were temporarily lifted under the ARRA; however, the restrictions have resumed in many states. Although the policy encourages some to work, it leaves many without either work or assistance.²³⁸
- **Increase the availability of and participation in summer meal programs for children.** The SFSP and the Summer National School Lunch Program (SNSLP) provide meals to children during the summer months, and play a vital role in providing nutritious food to children who rely on school meal programs during the school year. More widespread participation in summer meal programs is associated with lower risk of household food insecurity.¹²² Possible strategies to increase availability and accessibility include recruiting more community sponsors, increasing reimbursements for meals, reducing administrative barriers, addressing transportation challenges in rural areas, and improving program outreach.

- **Use SNAP to provide additional benefits in the summer for children who qualify for free meals during the school year.** Building on the electronic benefit infrastructure of the SNAP and WIC programs, the Summer Food for Children Demonstration Project showed that providing additional benefits to households with children during the summertime can substantially reduce food insecurity when school is out of session.²⁵
- **Encourage use of the new Community Eligibility Option to provide universal free meals in qualifying schools.** Allowing high-poverty schools to provide free meals to all students without having to assess individual students' eligibility can reduce food insecurity among children. Under the CEO, schools receive reimbursement for meals based on a formula that considers the share of students directly certified as eligible because of their participation in SNAP or certain other programs. Even though all children receive free meals under the CEO, the share of meals that are fully reimbursed by the federal government varies depending on the school's direct certification rate. Evaluation of the CEO indicates that it leads to significantly higher rates of participation among eligible children, saves the schools and educational agencies money, and does not adversely affect schools' ability to count and receive reimbursement for meals served.²³⁹
- **Expand and increase participation in the School Breakfast Program.** Research suggests that access to the SBP strengthens household food security among households at the margin of food security.¹⁹⁸ Although availability of the SBP has grown considerably over the past decade, substantial variation among states remains. Some states have expanded availability through mandates that require the program be offered in all schools whose districts have specified proportions of students in households with incomes below a given ratio of income to the poverty threshold, or qualifying for free or reduced-price lunch. Additional strategies that have supported participation include serving breakfast in the classroom as part of the school day; having breakfast available for a longer duration; and having buses arrive at school with sufficient time for children to eat.²⁴⁰
- **Expand the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), to serve a larger proportion of eligible mothers and children.** The WIC program is extremely important for the nutrition, health and food security of pregnant and lactating women, and for infants and children up to their fifth birthday.^{241, 242} A mother's nutrition during pregnancy affects both her and her child's health, and influences the establishment of developmental foundations which the child will build on throughout its lifetime.^{135, 243-247} WIC is particularly effective in protecting mothers, infants and young children from food insecurity^{248, 249} and its adverse health effects^{241, 250} because it incorporates health and nutrition examinations, counseling and education.
- **Expand, Simplify and Enhance the Child and Adult Care Feeding Program (CACFP).** Many children spend a significant amount of time in child care centers, presenting an opportunity for food and nutrition interventions to improve food security and health status.²⁵¹ The CACFP reimburses eligible child care providers for meals and snacks that meet specific nutritional guidelines. CACFP, which is scheduled for consideration as part of Child Nutrition Program reauthorization, currently subsidizes healthy meals for nearly three million low-income children per day in licensed child care centers and sponsored family day care homes (FDCHs). Because CACFP provides supplemental meals, the

CACFP is a very important nutrition assistance program, especially for children of working parents, and for at-risk elderly. However, aspects of its structure and administration may have become complicated and burdensome for families, FDCH operators, their sponsors, and state agencies. Revising and simplifying the area eligibility guidelines, and reducing the monitoring and paper-work requirements, could make it easier for FDCHs to comply with program rules, and provide the food that children and elderly need. Simplifying CACFP meal and snack reimbursement procedures might enable reimbursement rates to be increased, and help offset the higher costs of healthy foods. It could also help make it possible for FDCHs to add a third meal or snack option to meet the nutrition needs of children in care for longer hours.



5.3 STRENGTHENING THE PRIVATE CHARITABLE FOOD PROVIDERS SYSTEM

The private charitable food provider system—estimated to be approximately 10% of the size of the public food assistance system²⁵²—includes (1) the Feeding America national network of approximately 200 food banks nationwide, (2) the food pantries, soup kitchens, shelters and other programs operated by agencies those food banks serve, and (3) an additional set of food banks and food sites not in the Feeding America network. For many households, the private system has become a source of ongoing versus “emergency” food support. The private charitable food providers supplement and complement the public food assistance system for households who fall through the cracks of the public system, or who need additional support to make ends meet. The decentralized nature of the private charitable food assistance system gives it flexibility and enables it to respond in places and under circumstances that may be

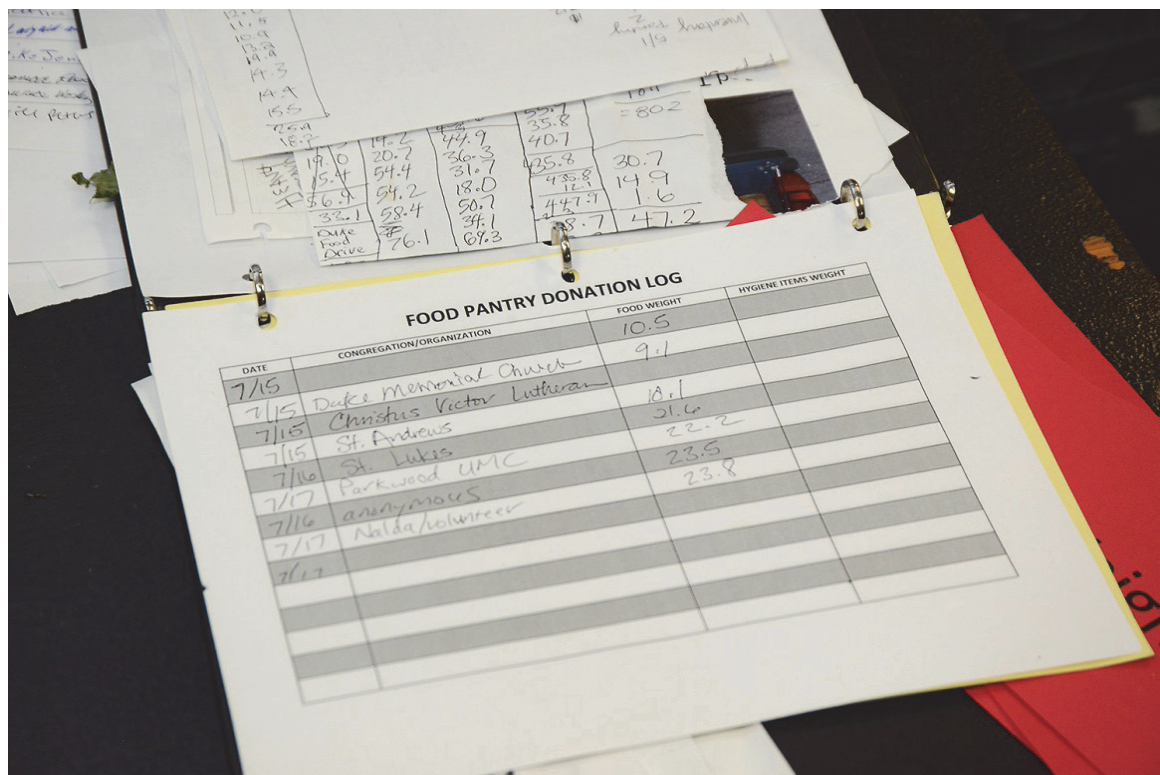
difficult to address through the public system alone. Research indicates that the private charitable food system is not large enough to singlehandedly solve food insecurity, and suggests that the use of soup kitchens and food pantries is not generally considered a normative food source. Nonetheless, strengthening and improving the private charitable food assistance system can limit the severity of food insecurity. Strategies for enhancing the charitable private assistance system range from public policies that impact the operations of local agencies to local community-based initiatives. Below, we provide a list of possible strategies.



- **Strengthen The Emergency Food Assistance Program.** TEFAP provides an important source of food and administrative funds for the private food assistance system. Utilizing a public and private partnership, funds are administered through Food Banks because they were found to be the most cost effective and efficient method to get food to the most people who need it.²⁵³ In 2012, over \$500 million in federal funding and food was distributed to food pantries through TEFAP, comprising about 20% of the food in the network.²⁵⁴ Increasing food and monetary support from the public system could increase the reach of the private system by allowing an increased amount of food to be distributed, and strengthen this private-public partnership.
- **Expand Commodity Supplemental Food Program (CSFP).** CSFP is the only USDA nutrition program that provides monthly food assistance specifically for seniors. CSFP

leverages government buying power to provide nutritious food packages. CSFP is a discretionary program funded each year through the federal appropriations process so the program may only serve as many eligible participants as funding allows. Through a strong public-private partnership, CSFP provides food and administrative funds to charitable providers, which in turn store and transport the food to local agencies for distribution to low-income clients. CSFP is currently operating in less than 40 states. Even within states where the program is operating, it is significantly limited with waiting lists of low income seniors.

- Incentivize businesses and farmers to donate excess or blemished food.** Mistakes during production may result in food that is perfectly safe and edible, but unable to be sold because of perceived quality, over production, or labeling issues. The outer packaging of grocery items may become damaged during distribution and retail operations, thus making them unsuitable for sale. Fresh food such as day-old bread, produce with blemishes, prepared foods, and other perishable items that are near sell-by dates may also be unsuitable for sale, but safe for consumption. Make permanent a provision that allows farmers, retailers, restaurants, and food manufacturers to take a charitable tax deduction for donations.



- Enhance linkages between food pantries and other services and programs.** Promote partnerships among service providers to facilitate the overall care of low income individuals. For example, encourage comprehensive food centers that integrate job training, cooking classes, and client choice food pantries under a single roof. Similarly, locate pantries at low-income schools or on college campuses to increase access for at-risk individuals and households.

- **Provide outreach at pantries to link clients to available safety net programs.** Provide information about other available services, such as SNAP and energy programs, for which clients may be eligible and conduct screenings to assess eligibility.

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APPENDIX A: METHODS

To gather comprehensive information about food security in the United States, RTI International conducted a “scoping” literature review and an environmental scan. A scoping literature review broadly surveys the literature, looking at key concepts and sources of available evidence available in this research area.^{255, 256} An environmental scan examines unpublished literature and publically available program information. Searches encompassed peer-reviewed literature, government and non-profit organizations’ reports, and commissioned papers. (Appendix A provides a detailed description of the methods.) The primary effort focused on capturing the state of science, particularly regarding what has and has not worked in food security interventions.

SEARCHES

ELECTRONIC DATABASES

To initiate this review, RTI, in collaboration with our technical expert panel and FNS, generated general search parameters and databases likely to provide the best information (**Table A-1**):

Table A-1. Search Parameters and Databases

Search Parameters	Databases
<ul style="list-style-type: none">▪ English language▪ Journal articles (not including book reviews, commentaries, editorials)▪ Full manuscripts▪ Human subjects of any age▪ 2008 to present▪ U.S. and Canada	<ul style="list-style-type: none">▪ PubMed▪ CINAHL (Cumulative Index to Nursing and Allied Health)▪ Web of Science▪ Agricola (Agricultural Research Services, USDA Agricultural Library)▪ New York Academy of Medicine GreyLit Report

RTI developed search terms by using several strategies: identifying keywords for the topics of interest (e.g., *food security, food insecurity, hunger, food insufficiency, food sufficiency, food hardship, partnership*). RTI provided the preliminary list of search terms to the expert panel to review and recommend additional keywords. RTI also selected two exemplary articles and examined those articles’ Medical Subject Headings (MeSH) terms and keyword indexing for additional search terms.

The final list of keywords and MeSH terms included the following:

- Food security

- Food insecurity
- Hunger (causes/consequences, outcomes)
- Food insufficiency
- Food sufficiency
- Food hardship
- Partnership
- Poverty (MeSH term)
- Food supply (MeSH term, which indexes food security and insecurity)

After assembling this comprehensive list of relevant MeSH terms and keywords, RTI engaged a research librarian familiar with all of the databases to conduct searches. The librarian conducted searches in the databases listed in Table 1. In addition, another search of the same databases focused on 15 authors who are well known in food security research (**Table A-2**).

Table A-2. Well-Known Authors Search

▪ Alaimo, K.	▪ Heflin, C.M.
▪ Bartfeld, J.	▪ Kirkpatrick, S.
▪ Chilton, M.	▪ Laraia, B.A.
▪ Coleman-Jensen, A.	▪ Nord, M.
▪ Cook, J.T.	▪ Olson, C.
▪ Frongillo, E.	▪ Rose, D.
▪ Gundersen, C.	▪ Seligman, H.K.
▪ Hamelin, A.M.	

The RTI conducted one final supplemental search addressing the prospective scope of food security, given the importance of this topic. For this search, we crossed the food security search terms with the following:

- Future
- Predictive (and derivatives)
- Model (and derivatives)

The research librarian exported all results into an EndNote (X7) database and deleted duplicate entries.

TARGETED WEBSITE SEARCHES

Through an environmental scan, RTI conducted a thorough search of the practice-based literature in print and electronic formats. As part of the scan, RTI conducted targeted and

general Internet searches. For the targeted search, we examined websites recommended by the expert panel, FNS, and RTI experts; in the general search, we entered various configurations of the search terms into Google.

The targeted search involved using the keywords to search specific Web sites that either focus on food security, poverty, and hunger or provide reports on those topics. RTI with input from the technical expert panel and FNS identified the following Web sites for the targeted search.

- Institutes of Medicine
- National Research Council
- National Academy of Sciences
- Food and Nutrition Service
- Economic Research Service, USDA University of Kentucky Center for Poverty Research
- RIDGE Center for National Food and Nutrition Assistance Research, University of Wisconsin-Madison
- National Poverty Center
- Food Research and Action Center
- National Statistics Food and Nutrition Board
- Feeding America
- Center for Hunger-free Communities
- Children’s Healthwatch

To facilitate the search and ensure a common review approach across sites, we established three Boolean search strings with the keywords (**Table A-3**), and using the Google search feature that allows users to limit searches to particular domains, we applied each Boolean string in turn. We mined search results for possible examples that met the eligibility criteria (described below). For each search, we reviewed the first 20 links. If that set of links identified a potential example, then the next 10 links were reviewed. If another example was identified, then the next 10 links were reviewed until no additional potential examples were identified. Once a set of search terms was exhausted, we entered a different combination of terms into Google and repeated the same process. We added documents that met selection criteria to an Excel spreadsheet for tracking and review and eventual entry into the EndNote database.

Table A-3. Boolean Searches Used in the Environmental Scan

#1: ["food security" OR "food insecurity" OR "food insufficiency" OR "food sufficiency" OR "food hardship" OR (hunger AND poverty) OR (hunger AND causes) OR (hunger AND outcomes)] site:xxx

#2: [("food security" OR "food insecurity" OR hunger OR "food insufficiency" OR "food sufficiency" OR "food hardship") AND (partner OR partnership)] site:xxx

#3: [("food security" OR "food insecurity" OR hunger OR "food insufficiency" OR "food sufficiency" OR "food hardship") AND (program OR intervention)] site:xxx

GENERAL SEARCHES

In the general searches, we applied the key words in Boolean combinations and conducted the same three searches described in the *Targeted Search* section. Unlike the targeted search, which limited the search terms to particular websites, general searches allowed Google to look for search for examples beyond the organizations listed in the *Targeted Search* section.

We mined each set of Google search results for possible examples that met the established eligibility criteria for this review. We reviewed the first 20 links. If a potential example was identified in that set of links, then the next 10 links were reviewed. If another example was identified, then the next 10 links were reviewed until no additional potential examples were identified. Once a set of search terms was exhausted, we entered a different combination of terms into Google and repeated the same process was repeated. We added documents that met the selection criteria were added to an Excel spreadsheet for tracking and review.

MANUAL SEARCHES

To be as comprehensive as possible, increase the sensitivity of electronic database searches and minimize retrieval bias, RTI performed manual searches (also known as *handsearches*). By *retrieval bias* we mean the failure to find relevant literature due to the retrieval capacity of a database. This could result from the technical design of the database or the classification of the literature by means of meta-data, such as deficient indexing of an article or inadequate key words. Retrieval bias differs from publication bias, which results from the selective publication of literature. We addressed the latter in our environmental scan. For manual searches, RTI identified key articles from the results of the electronic database searches and environmental scan searches. Key articles are relevant, high-quality studies, reports or background articles. The reference lists of the key articles were scanned to identify titles of relevance to this scoping review. Relevant titles were checked against the EndNote database. Those that were not already in the review database were added and subject to the same review process.

SCREENING PROCESS

To identify the most appropriate articles for the Hunger Commission report, RTI developed eligibility criteria (**Table A-4**).

Table A-4. Inclusion/Exclusion Criteria

<p>Include articles that address the following topics:</p> <ul style="list-style-type: none">▪ Summary of research conducted to date▪ Current & prospective scope of food security and hunger▪ Key determinants of food security and hunger▪ Consequences of food insecurity and hunger▪ Food insecurity's interaction with other hardships▪ Responses to food security and hunger▪ Programming and policy recommendations

Table A-4. Inclusion/Exclusion Criteria (continued)

Exclude articles that:
<ul style="list-style-type: none">▪ Evaluate the SNAP program but do not discuss direct relationship with food security▪ Address food safety (e.g., protecting the food supply from terrorists)▪ Pertain to aboriginal populations in Canada

RTI developed an abstract review form using these pre-specified eligibility criteria and reviewed all titles and abstracts identified from searches to determine whether the reference should be considered for inclusion for full text review, and potentially inclusion in the report.

After completing the initial review, RTI then mapped the remaining documents to the annotated report outline topics to determine whether the article would provide valuable information for the final report. Upon more detailed examination of full text articles and reports, some references were deemed to provide little or no valuable information and were subsequently excluded.

DATA EXTRACTION AND SYNTHESIS

We designed and used a structured data extraction form to ensure consistency of abstraction of documents meeting eligibility criteria. Data abstraction focused on the following elements in each document:

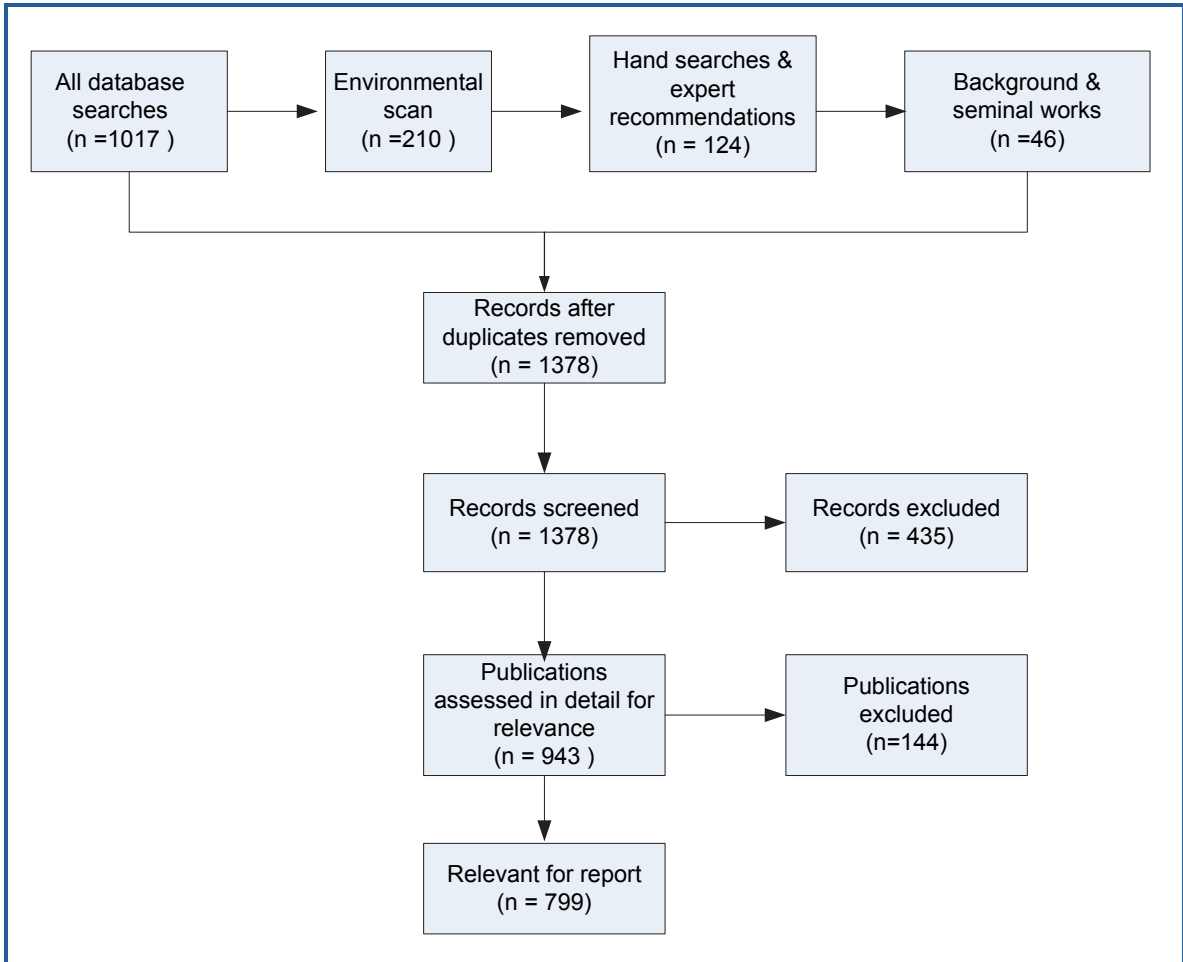
- Report topic(s) that the document addresses
- Citation information (i.e., author, year published)
- Key findings

RTI used the completed extraction forms to synthesize information for the final report.

RESULTS

Figure A-1 shows the results of all searches for this report. All records were imported to an EndNote database and duplicates were removed. RTI reviewed 1,378 references for eligibility. During initial screening, we determined that 435 records did not meet inclusion criteria. The remaining 943 references were reviewed in more detail, looking at full text whenever necessary. At this stage, we excluded an additional 144 articles, leaving 799 eligible citations deemed to be relevant to our review. We could not cite all relevant citations; therefore, we focused efforts on the most relevant and informative for the purposes of this report.

Figure A-1. Disposition of References Reviewed for this Report



APPENDIX B: QUESTIONS USED TO ASSESS THE FOOD SECURITY OF HOUSEHOLDS IN THE CPS FOOD SECURITY SURVEY

1. "We worried whether our food would run out before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months?
2. "The food that we bought just didn't last and we didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?
3. "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. 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)
7. In the last 12 months, were you ever hungry, but didn't eat, because there wasn't enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn't enough money for food? (Yes/No)
9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

(Questions 11-18 were asked only if the household included children age 0-17)

11. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?
12. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months?
13. "The children were not eating enough because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (Yes/ No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (Yes/No)

17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. 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? (Yes/No)

APPENDIX C: A BRIEF HISTORY OF FOOD SECURITY MEASUREMENT IN THE UNITED STATES

THE PRESIDENT’S TASK FORCE ON FOOD ASSISTANCE

Concerns about hunger in the United States were prominent during the Great Depression of the 1930s, reemerged during the 1960s, and again in the 1980s.²⁵⁷ In response to a growing number of reports related to hunger during the early 1980s, President Ronald Reagan appointed a Task Force on Food Assistance in 1983 to help clarify the nature of the problem. In its report, released in January 1984, the Task Force addressed the question “How much hunger is there in America?” And though it concluded that “We find hunger to be a real and significant problem throughout the nation”, the Task Force report also noted that “. . . it is at present impossible to estimate the extent of that hunger.”²⁵⁸

President Reagan’s Task Force on Food Assistance identified and highlighted a critical need for scientifically valid and reliable measures of hunger for the U.S. population. The Task Force also suggested a framework on which later efforts to develop measures of food security and hunger were able to build when it articulated a view of hunger as poverty-related food insufficiency that includes lack of access to enough food to meet a family’s needs, whether or not it includes clinical or medical symptoms of deprivation.²⁵⁸

THE LIFE SCIENCES RESEARCH OFFICE (LSRO) DEFINES FOOD SECURITY AND HUNGER

The framework for understanding hunger suggested by the President’s Task Force was extended, clarified and strengthened by the 1990 report of an Expert Panel convened by the Life Sciences Research Office (LSRO) of the Federation of American Societies for Experimental Biology for the American Institute of Nutrition. In its report on Core Indicators of Nutritional State for Hard-to-Measure Populations, the Expert Panel spoke specifically to issues related to measuring hunger, and placing it within the context of “food security”, which it also defined and explained.

The LSRO Expert Panel defined food security as “access by all people at all times to enough food for an active, healthy life and includes at a minimum: a) the ready availability of nutritionally adequate and safe foods, and b) the assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, and other coping strategies).” The Panel went on to state that “food insecurity exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain. Hunger (in its meaning of the uneasy or painful sensation caused by a lack of food) and malnutrition are potential, although not necessary, consequences of food insecurity.”²⁵⁹

The definitions of food security, food insecurity, and hunger developed by the LSRO Expert Panel became the basis for beginning an extensive process to develop measures of those conditions for the U.S. population. That process was formally supported by the 10-Year Comprehensive Plan for the National Nutrition Monitoring and Related Research Program (NNMRRP) mandated in the National Nutrition Monitoring and Related Research Act of 1990. Under the 10-Year Comprehensive Plan for the NNMRRP, the USDA Food and Nutrition Service, and the Department of Health and Human Services' National Center for Health Statistics (NCHS) were jointly given the task of recommending "*a standardized mechanism and instrument(s) for defining and obtaining data on the prevalence of "food insecurity" or "food insufficiency" in the U.S. and methodologies that can be used across the NNMRRP and at State and local levels.*" Moreover, the definitions provided by the LSRO Expert Panel indicated a measurement framework in which hunger was seen as a potential consequence of food insecurity.²⁶⁰

EARLIER FOOD SECURITY AND HUNGER MEASUREMENT ACTIVITIES

While the LSRO Expert Panel was developing operational definitions of hunger and food security, several activities aimed at measuring them were already underway. The most extensive, the Community Childhood Hunger Identification Project (CCHIP) sponsored by the Food Research and Action Center (FRAC), involved implementation of a "hunger scale" developed by Cheryl Wehler.²⁶¹ Another measurement initiative, based in Cornell University's Division of Nutritional Sciences, involved scales developed by Kathy Radimer that treated food security and hunger as practically two separate but related conditions, and attempted to measure them separately.²⁶² And a third activity led by Peter Basiotis of the USDA Food and Nutrition Service (FNS), focused on the concept of "household food sufficiency," and used a multi-component question developed by USDA and included in its food consumption surveys in the 1980s.²⁶³

Combining information from this USDA food sufficiency question with food consumption data from the same nationally representative surveys of the U.S. population, Basiotis produced strong evidence that survey respondents were able to identify and report the degree of sufficiency of food in their households, and that those reports were consistent with the characteristics of foods they reported members of their households consumed. In the early 1990s, these measurement activities helped provide researchers at USDA and NCHS a solid basis for beginning an extensive review and compilation of existing research literature on hunger, food security, food sufficiency, and attempts to measure them. The information gathered by that effort in turn led these two government agencies to sponsor a National Conference on Food Security Measurement and Research in 1994.

THE 1994 CONFERENCE ON FOOD SECURITY MEASUREMENT AND RESEARCH

The 1994 National Conference brought together leading academic experts, private researchers, and key staff of the concerned Federal agencies to collaborate in identifying the appropriate

conceptual basis for national measures of food security, food insecurity and hunger in the U.S. population. The conference also reached a working agreement as to the best operational form for implementing such a measure in national surveys.

Over the following year, collaborators who had attended the National Conference on Food Security Measurement and Research, worked with an interagency government team to review a large number of candidate questions on food security and hunger that had emerged during the National Conference. That collaborative review resulted in selection of a set of questions to be tested by survey experts at the Census Bureau for potential inclusion in a food security and hunger measurement instrument.

After extensive cognitive assessment and field testing, Census Bureau survey methodologists finalized a pilot food security questionnaire and included it as a supplement to its annual Current Population Survey (CPS) in April 1995. That same year USDA and NCHS sponsored a competitive award process to select a private-sector consulting firm to assemble a team to design, implement and manage the Food Security Measurement Study. That national research and measurement study, awarded to Abt Associates Inc., would use data from the Census Bureau's first administration of the pilot food security measurement questions in the CPS to develop, test and validate a U.S. Food Security Scale. After additional testing and validation performed by analysts at FNS and ERS, that U.S. Food Security Scale would later become the core of the U.S. Food Security Survey Module.²⁶⁴

THE FOOD SECURITY MEASUREMENT STUDY

From 1995-1997, the multidisciplinary team assembled by Abt Associates Inc. worked closely with FNS, an interagency working group on food security measurement, and other key researchers involved in developing the questionnaire, to analyze data from the Census Bureau's first administration of the preliminary questionnaire, and produce and validate a Food Security Scale. The Abt team employed Item Response Theory (IRT) methods, comparable to those used to develop and validate national achievement tests and college and professional school (e.g., medical and law school) entrance exams, to develop and perform psychometric tests on the scale. IRT methods enable scale developers to select from a pool of candidate questions the best subset of questions for distinguishing the presence of a condition, and for determining the level of strength or severity of the condition.²⁶⁴ The optimal scale has validity (it accurately measures the condition of interest), reliability (it yields the same results over multiple administrations by different people), and is not so long or complicated that it leads to "respondent burden" which can result in measurement error.

The final scale, selected after exhaustive testing of each candidate question, and subsets of questions to identify the set that performed best together, was a valid, reliable, and "very-well-ordered" set of 18 questions.²⁶⁵ Being well-ordered meant that if a respondent answered affirmatively to any particular question, they had a very high probability (approaching certainty) of also having answered affirmatively to all less-severe questions. This property of

the scale is critical for identifying severity levels and categorizing households' by level of severity of the condition being measured.²⁶⁴

CONTINUING VALIDATION AND TESTING

The U.S. Food Security Scale was delivered to USDA by Abt Associates Inc., and released to the public, in 1995. However additional work continued over the next five years to test, validate and improve the scale.²⁶⁶⁻²⁶⁸ These activities confirmed the stability and validity of the scale, and helped to encourage its use in research in the U.S. and other countries. In 1998 USDA's Economic Research Service assumed sponsorship of the Census Bureau's annual food security survey and responsibility for analyzing and reporting the data, and coordinating ongoing USDA research on food security and food security measurement.³

THE COMMITTEE ON NATIONAL STATISTICS' REVIEW OF THE FOOD SECURITY MEASURES

In 2003-2006 the Committee on National Statistics (CNSTAT) of the National Academies convened an expert panel to conduct a thorough review of the food security measurement methods. The review was requested by USDA, as required by law, to ensure that the measurement methods being used to assess households' access - and lack of access - to adequate food and the language used to describe those conditions are scientifically sound, and convey useful and relevant information to policy officials and the public. The CNSTAT panel found the methods used to measure food security, food insecurity, and hunger appropriate and recommended that USDA continue to monitor food security regularly in a household survey. In addition the panel made several recommendations regarding potentially useful modifications of certain aspects of the methods, for USDA to test and adopt if shown to be beneficial and cost-effective. The panel also expressed its views on the desirability of particular language used to describe results from the measures, and made recommendations to USDA in that regard.⁴

Overall the CNSTAT review of the food security measures was positive, and confirmed their validity and appropriateness. USDA followed the CNSTAT's recommendations and partnered with other researchers to test the validity and desirability of the methodological changes it had suggested. Based on results of confirmatory research, USDA adopted those modifications that were shown to lead to clear, cost-effective improvements. In 2006, USDA also modified the language used in its annual reports on food security to describe results derived from the CPS data on food security, as recommended by the CNSTAT panel.

³ A summary of the history of the U.S. Food Security Measurement Project, including ERS' role and assumption of sponsorship of the survey and reporting its results is provided at http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/history-background.aspx#.U8HLrLFv_Ok. Material from that site was used in compilation of this Brief History, for which we are very grateful to Mark Nord, Alisha Coleman-Jensen, and Christian Gregory.

⁴ A summary of the CNSTAT review process, along with some of its recommendations, can also be found at http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/history-background.aspx#.U8HilbFv_Ol.

THE U.S. HOUSEHOLD FOOD SECURITY SCALE

In 2012, researchers at ERS compiled and made available a current version of the U.S. Household Food Security Scale (HFSS) to help other researchers achieve accuracy and standardization in application of the measures in empirical research. The USFSSM is available at the ERS Food Security in the United States website (http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us.aspx#.U8HyuLFv_Ok) along with very helpful guidance and recommendations for researchers' use of the module. In addition, ERS researchers have been an ongoing accessible and extremely helpful sources of advice, help and guidance for public and private researchers who wish to use the food security measures in their own research. The support provided by ERS has been a key factor in the large number of high-quality research studies that have been conducted on food security in the U.S.

ADMINISTRATION OF THE HFSS IN OTHER U.S. NATIONAL SURVEYS

In addition to its annual inclusion as a supplement to the Current Population Survey each December, the USFSSM has also been implemented in several other U.S. national surveys, including:

- [Survey of Program Dynamics \(SPD\)](#).
- National Health and Nutrition Examination Survey (NHANES IV).
- [National Center for Educational Statistics' Early Childhood Longitudinal Study-Kindergarten Cohort \(ECLS-K\)](#).
- [National Center for Educational Statistics' Early Childhood Longitudinal Study-Birth Cohort \(ECLS-B\)](#).
- [National Health Interview Survey \(NHIS\)](#).
- [Panel Study of Income Dynamics \(PSID\)](#).
- [Survey of Income and Program Participation \(SIPP\)](#).

CYCLE OF FOOD INSECURITY

- Obesity and chronic diseases
- Mental health issues, depression and stress
- Negative pregnancy outcomes
- Diminished human capital
- Lowered productivity in workplace

ADULT



INFANT



- Physical health and illness
- Failure to thrive

NUTRITIONAL DEFICIENCIES

CHILD



- Physical health and illness
- Cognitive delays and effects on learning
- Behavioral & social issues

- Physical health and obesity
- Increased learning deficits
- Behavioral and social issues
- Mental health issues and depression
- Limited human capital development

ADOLESCENT/TEENAGER



HEALTH AND ECONOMIC OUTCOMES ACROSS THE LIFESPAN