Supporting Food & Nutrition Security through Healthcare

A Resource for Healthcare Systems and their Public Health and Community Partners

Tufts University | Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy

NOPREN Nutrition & Obesity Policy Research & Evaluation Network

UCSF University of California San Francisco

Table of Contents

Background **4**

The Burdens of Food Insecurity and Nutrition Insecurity 6

Nutrition Security in the Framework of Structural and Social Determinants of Health 8

Equity 8

Food is Medicine 9

Food is Medicine Programs **12**

Eligibility for Food is Medicine Programs 13

Referrals to Food is Medicine Programs 14

Spectrum of Food is Medicine Programs 16

Challenges and Opportunities for Partnership 26

Community-Level Food & Nutrition Security Assessment **28**

Building Support for Food is Medicine Programs **32**

Evaluation **34**

Data Collection and Reporting 35

Metrics 38

Quality Improvement vs. Research 41

Institutional Review Boards 42

Data Sharing 43

Funding Mechanisms **44**

Grant Funding 45

Healthcare Quality Improvement and Private Sector Funds 47

Medicaid and Medicare Benefits 47

Healthcare Provider Pathways 49

Sustainability through Policy 49

Conclusions **50**

References **52**

Appendix **60**

Authors

Ronli Levi, MPH, RDN, University of California, San Francisco

Hilary Seligman, MD, MAS, University of California, San Francisco

Dariush Mozaffarian, MD, DrPH, Tufts University

Reviewers and Contributors

Alyssa Auvinen, MPH, Washington State Department of Health

Seth Berkowitz, MD, MPH, University of North Carolina, Chapel Hill

Heidi Blanck, PhD, Captain, Retired USPHS, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention

Katie Garfield, JD, Center for Health Law and Policy Innovation, Harvard Law School

Diane Harris, PhD, MPH, CHES, Division of Nutrition, Physical Activity, and Obesity Centers for Disease Control and Prevention

Rachel Laundauer, JD, Center for Health Law and Policy Innovation, Harvard Law School

Katie S. Martin, PhD, More Than Food Consulting, LLC

Rae-Shelle Mortimer, MPH, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention

Rita Nguyen, MD, San Francisco Department of Public Health

Angela Odoms-Young, PhD, Cornell University

Barbara Petee, The Root Cause Coalition

Dipa Shah, MPH, RDN, Los Angeles Department of Public Health

Morgan Smith, MS, RN

Amy Lowry Warnock, MPA, Division of Nutrition, Physical Activity, and Obesity Centers for Disease Control and Prevention

Alissa Wassung, Food is Medicine Coalition

David Waters, Community Servings

Amy Yaroch, PhD, Gretchen Swanson Center for Nutrition

Suggested Citation

Nutrition and Obesity Policy Research and Evaluation Network (NOPREN). 2023. *Supporting Food & Nutrition Security through Healthcare: A Resource for Healthcare Systems and their Public Health and Community Partners.* San Francisco, CA: University of California, San Francisco.

Acknowledgements

This work is supported by the Centers for Disease Control & Prevention; Division of Nutrition, Physical Activity, & Obesity; National Center for Chronic Disease Prevention and Health Promotion. Cooperative Agreement Number 6U48DP006374 SIP19-010.

Background

Background

Food is Medicine Programs

Community-Level Food & Nutrition Security Assessment

Building Support for Food is Medicine Programs

Evaluation

Funding Mechanisms

Conclusions

References & Appendix

Suboptimal nutrition is a leading cause of illness, death, healthcare spending, and lost productivity.[1,2] Poor nutrition contributes to and exacerbates health disparities among individuals with low socioeconomic status, living with a disability, experiencing discrimination, and other populations who have difficulty accessing and affording nutritious food, contributing to higher rates of food insecurity and diet-related illness. Optimal nutrition is critical to achieving health and well-being for all.

Generally, few sustained policy and other systems interventions have focused on improving nutrition to both treat and prevent chronic disease, especially within healthcare systems. However, this is rapidly evolving. An initial focus has been food insecurity, with the goal of increasing availability of and access to food that is safe, affordable, and consistent with individuals' food preferences.[1] Leaders in public health and healthcare systems increasingly recognize the links between food security, health, and well-being, and the important role systems play in addressing food security. State and local public health departments are engaging in surveillance of food security and other social needs, supporting (and sometimes staffing) community-based food programs, coordinating across programs and sectors, and engaging in community and state coalitions. Healthcare system initiatives are varied and have included efforts such as conducting community health needs assessments (CHNAs) to identify areas of social need, screening for food insecurity in clinical practice, documenting and tracking food insecurity screening results in the electronic health record, and establishing referral systems to social safety net programs.

While more work must be done to better support food security, it is clear that diet-related diseases, health disparities, and the economic costs of these burdens will also require a shift in healthcare and public health systems to focus on *nutrition security*.

The concept of nutrition security is relatively new in the U.S. While there is not yet a standard definition or measure of nutrition security, a core concept is ensuring that screening, measurement, and programs incorporate not only access to sufficient calories, but also sufficient nutrients.[2–4] Current screening tools to address food insecurity generally include few or no nutritional dimensions. Although the USDA Food Security Survey Module (FSSM) does include an item that assesses nutritional "balance," nutrition security centralizes the role of diet quality and nutritional status rather than food quantity. Rising rates of obesity and type

Food Security

The USDA defines food security as access by all people at all times to enough food for an active, healthy life.

Nutrition Security

The USDA defines nutrition security as consistent access, availability, and affordability of foods and beverages that promote well-being, prevent disease, and, if needed, treat disease, particularly among racial/ethnic minority, lower income, and rural and remote populations including Tribal communities and Insular areas.

Although distinct concepts, we will use the term 'food and nutrition security' in this resource to refer holistically to the accessibility, availability, and affordability of both sufficient quantity and quality of food for an active, healthy life that promotes well-being, prevents disease, and, if needed, treats disease.

Background

National Strategy on Hunger, Nutrition, and Health: Key Recommendations for Healthcare Systems and Community Partners to Advance Nutrition Security

- Expand pilot programs and coverage of Food is Medicine programs (including medically tailored meals and produce prescription programs) in Medicare, Medicaid, the VA, Indian Health Service, and private sector healthcare
- Increase nutrition education for doctors and other healthcare providers
- Conduct universal screenings for food insecurity in federal systems
- Support investment in data infrastructure for food insecurity screenings in public and private healthcare
- Incentivize healthcare systems to conduct food insecurity screenings and provide services to support those identified as food insecure
- Expand and diversify the registered dietitian nutritionist (RDN) workforce

2 diabetes, combined with other nutrition-related chronic conditions such as cardiovascular diseases and cancers, are among the leading causes of deaths, morbidity, and healthcare spending nationally. Thus, food and nutrition security must be a priority for healthcare systems—for all patients, and especially those experiencing food insecurity and/or who are at risk for or are living with a chronic disease.[5,6]

In September 2022, the White House hosted its first conference in fifty years focused on food, nutrition, and health. This historic event brought together individuals across multiple sectors to outline and discuss key priorities for addressing nutrition and health. At the same time, the administration released a National Strategy on Hunger, Nutrition, and Health that has important commitments for actions to reduce both food and nutrition insecurity and promote health equity.

This resource summarizes the ways in which healthcare systems, public health practitioners, and public health allies can partner to support food and nutrition security in their communities through programs, policies, and practices. It is written with a lens towards supporting actors to work together to address diet-related health disparities, including healthcare systems and payors, state health agencies, local health departments, and other public health allies such as universities, community-based organizations, and Centers for Disease Control and Prevention (CDC) grantees.

The Burdens of Food Insecurity and Nutrition Insecurity

The U.S. healthcare system faces a remarkable challenge – a nutrition crisis that is cutting lives short, contributing to major health disparities, and resulting in hundreds of billions of dollars in preventable healthcare spending and lost human productivity. Today, most Americans do not meet the recommended nutrition standards as outlined by the Dietary Guidelines, putting them at risk for poor health. About half of adults have diabetes or prediabetes and three-quarters are overweight or obese, while fewer than 7% are metabolically healthy.[5] Poor nutrition is also predisposing children to disease, disability, and lost potential. In the U.S., obesity affects about 1 in 8 children between the ages of two to five years old and almost 1 in 4 teenagers.[6] A recent federal report from the U.S. Government Accountability Office (GAO) concluded that diet-related conditions, such as cardiovascular disease, diabetes, and cancer, are deadly, costly – and largely preventable.[7] These diseases caused over half of U.S. deaths in 2018, and during the height of the COVID-19 pandemic, Americans with these conditions were 12 times more likely to die after infection.[8]

Because of the benefits of a nutritious diet and the generally poor quality of the American diet, many populations can benefit from food and nutrition programs. However, programs that address food and nutrition security are typically aimed at individuals and families who are:

- **Living with or at high risk for developing a diet-related chronic disease,**
- **Low-income, and/or**
- **Food insecure**

See section Eligibility for Food is Medicine Programs for more details about how to identify a patient population.

One in 10 U.S. households experience food insecurity at some time each year.[9] People in these households worry about having sufficient food to eat; shift dietary intake from more expensive, healthier foods (e.g., fruits and vegetables) to less expensive, more energy-dense, nutrient-poor foods; and experience fluctuations in their dietary intake related to how much money is available for food at any given time. These dietary patterns, when sustained over a long period of time, increase risk of developing obesity, diabetes, and other diseases related to diet. And, once these diseases have developed, food insecurity makes it more challenging to access the foods critical to effective management and treatment plans.

Nearly half of U.S. adults consume diets of poor nutritional quality, with even higher rates among adults experiencing food insecurity, with low incomes, less education, and/or racial/ethnic minority backgrounds. Poor diet contributes to substantial disease burdens as well as health disparities. For example, suboptimal intake of 10 dietary factors (see footnote[a]) is estimated to cause 45% of U.S. deaths from cardiovascular diseases and diabetes.[11] However, research shows that households experiencing food insecurity and/or low-incomes desire healthier food options, such as produce and protein, over items that have lower nutritional value, demonstrating that poor diet quality is often due to a lack of access and affordability rather than lack of demand.[12,13]

The economic consequences of these diet-related diseases mirror their burdens on human health. Healthcare spending now accounts for nearly 1 in 5 dollars in our economy, and nearly 1 in 3 dollars in the federal budget and average state government budgets.[14] Most of the spending goes to treatment of preventable chronic diseases. For example, 1 in every 7 healthcare dollars is

a Dietary factors include fruits, vegetables, nuts/seeds, unprocessed red meat, processed meats, sugar sweetened beverages, unsaturated, seafood, sodium, and polyunsaturated fatty acids

Background

attributable to diabetes, a condition that is largely preventable and treatable with good nutrition.[15] Poor diets have also been linked to $50 billion in health care costs, and these costs are steadily rising.[16] Medical spending on diabetes alone has risen 25% over a five year period.[15] In addition to economic costs, chronic disease burden may also have a significant impact on people's quality of life.

Nutrition Security in the Framework of Structural and Social Determinants of Health

Nutrition security is a direct determinant of health, not only a social determinant of health.

The healthcare system can play a role in addressing an individual's acute social needs, such as providing referrals to food assistance programs and housing. In a national survey of hospitals and healthcare systems, 88% of organizations reported that they were conducting some social needs screening.[17] Healthcare systems can also address social determinants of health (SDOH) by working with other community, state, and national stakeholders to influence the social, cultural, and economic structures that affect health.[18]

While related to social needs and influenced by SDOH, nutrition security is a distinct challenge. As the top driver of poor health in the U.S. and globally, lack of access to good nutrition is not only a social determinant of health, but also a direct determinant of health, fundamental to the goals and responsibilities of a healthcare system. Thus, just as healthcare systems measure, follow, and address major proximal or behavioral determinants of health among their patients (such as smoking, physical inactivity, depression symptoms, high blood cholesterol, and high blood pressure), healthcare systems can better provide care to their patients by monitoring and addressing food and nutrition insecurity. This will require new goals and investments in collaboration, measurement tools, and methods of implementation.

Equity

Health disparities have many drivers, including unequal access to education, jobs and wages, structural racism, and place-based differences (e.g., in air pollution, water quality, the food environment, green spaces and opportunities for exercise, and neighborhood safety, to name just a few), that result from and interact with other inequities.[19] Food and nutrition insecurity are critical consequences and mediators of these drivers, contributing to disparities in obesity, diabetes, hypertension, dyslipidemia, cardiovascular diseases, several cancers, and other diet-related diseases. In turn, onset and severity of these diet-related conditions contribute to lost productivity and wages, higher out-of-pocket spending, disability, and poor learning, further exacerbating underlying social and economic inequities and worsening health disparities.[15,20]

Based on the foundational role of food and nutrition in health, nutrition security programs can be an important part of addressing health disparities, helping to close the gap in prevalence, severity, and complications of diet-related conditions.[21] Thus, program design, implementation, and evaluation should be centered on assessment and consideration of equity. Because individuals with diet-related chronic diseases are already more likely to be from historically marginalized groups, programs addressing these conditions, specifically within these groups, should theoretically help reduce health disparities. However, this will only occur if program access, participation, and retention are equally available to populations and communities most affected by these disparities. Programs should therefore track, monitor, and course correct to ensure that outcomes are equitable across age, sex, race/ethnicity, income, education, health insurance status, and geographic residence.

In addition, health equity may be accelerated if screening, eligibility, and enrollment criteria include factors linked to health disparities, such as insurance provider (e.g., Medicaid), food security status, household income, and neighborhood of residence. Some nutrition security programs have explicitly included one or more of these factors in their design, screening, and eligibility.

Potential cultural differences in food preferences should also be considered in program design and evaluation, as such differences may be especially relevant for racial/ethnic minority, immigrant, and undocumented populations who are also more likely to suffer from health disparities.

Food is Medicine

What is Food is Medicine (FIM)?

Food is Medicine is a spectrum of programs, services, and other interventions that recognize and respond to the critical link between nutrition and health, particularly within healthcare systems.[22]

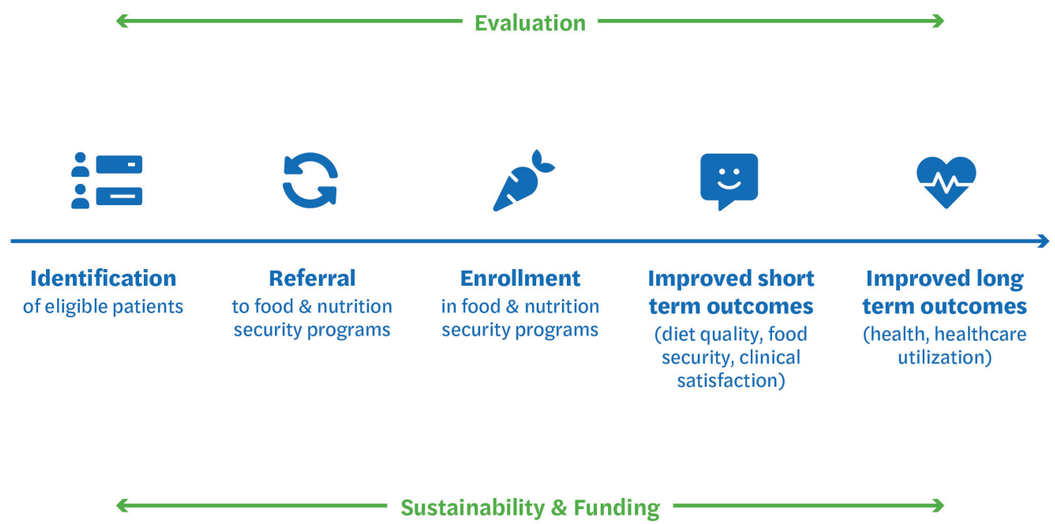
Recognition of the role that food and nutrition security play in health has created new urgency for healthcare to incorporate food and nutrition programs into their strategy and actions – a *Food is Medicine* (FIM; also, often called Food as Medicine) approach. Descriptions and examples of FIM programs are included in the next section (see Food is Medicine Programs). A focus on FIM builds on mounting public awareness of the central role of food in well-being and a demand for more holistic, patient-centered care. The federal government is also taking note. Congressional leaders have recognized that, "86% of the nation's $2.7 trillion annual healthcare expenditures go to addressing chronic health conditions, including diet-related conditions, such as diabetes." And, as noted above, the White House is taking meaningful action to support policies and programs that advance FIM programs. In the context of this rapid momentum, implementers are increasingly asking questions about what to do now.

New research and scientific evidence shed light on how healthcare systems can improve food and nutrition security, health, and health equity. There are also new state, federal, and private payer healthcare investments to test FIM approaches. Widescale adoption and integration of nutrition security programs into healthcare will require partnerships with public health and program implementers to understand the actors in the space, develop and apply screening and tracking

tools, and employ, evaluate, and scale a spectrum of nutrition security programs.

In this guide, we focus on approaches that help facilitate the healthcare system to provide nutritious food, or resources to access nutritious food, to high-risk patients. Other relevant approaches, including nutrition education and counseling, nutrition training for physicians and other clinical providers, and other complementary approaches are important but are not covered in this guide. Finally, FIM programs may also play an important role in other areas, including the health of local economies, rural development, and sustainable agriculture. Though these issues are outside the scope of the present guide, healthcare and community implementers may wish to consider them in the design and evaluation of their programs.

Figure 1: Connecting Patients to Healthy Foods and Beverages via the Healthcare Setting Can Promote Health



Food is Medicine Programs

Background

Food is Medicine Programs

Community-Level Food & Nutrition Security Assessment

Building Support for Food is Medicine Programs

Evaluation

Funding Mechanisms

Conclusions

References & Appendix

Eligibility for Food is Medicine Programs

FIM programs are typically designed to serve patients in clinical settings or a specific population catchment area. Many different patient populations can be targeted, according to risk factors, disease conditions, or other eligibility criteria. For example, some programs seek to reach individuals with or at high risk for a health condition (e.g., type 2 diabetes), while others focus on food insecure and low-income patients more broadly.[23] Here are common ways in which patients have been identified for participation in FIM programs:

1. **Food insecurity:** Many clinical settings have implemented screening programs for food insecurity, generally using the two-item Hunger Vital Sign (HVS) screening tool. Patients screening positive for food insecurity can be asked: "Would you be interested in learning about how we can help you access nutritious food today?" Some healthcare systems have not implemented a formal screening process (such as the HVS), but providers may still become aware of their patients' difficulty affording and accessing healthy food during the course of care, and instead use their clinical judgement to refer them to FIM programming.

2. **Other socioeconomic criteria:** Where clinical screening of individual patients is not feasible, or has insufficient support, existing data in the electronic health record can be used to identify patients at high risk of food insecurity. For example, Kaiser Permanente Colorado has used criteria such as dual eligibility for Medicare and Medicaid to identify patients at high risk of food insecurity,[24] while Kaiser Southern California has used Medicaid enrollment to identify patients at high risk. Because health inequities often overburden Black/African American populations, leading healthcare systems in San Francisco, Texas, and elsewhere have prioritized Black/African American populations for access to FIM programs.

3. **Specific disease conditions:** Many programs aim to reach specific patient populations, including people with type 2 diabetes or hypertension, people hospitalized with heart failure at the time of discharge, children who are overweight or obese, frail, malnourished, or disabled adults with chronic disease at risk of institutionalization. An assessment of functional status is an important criterion for determining the types of programs that may be best suited to an individual patient's needs.

4. **Nutrition security:** Several tools for assessing nutrition security are under development and testing. This includes one module that has been pilot tested by both the Los Angeles County Department of Public Health and Kaiser Permanente in partnership with Tufts University to assess nutrition security, among produce prescription and medically tailored meal recipients (see Appendix). These measures are still in phases of development and testing, and it will be important for researchers to validate such measurement tools.[25]

Whichever patient population is identified for referral to FIM programs, and regardless of what strategy is used, it is critical that this information be recorded in a structured field in the electronic health record (EHR). Although underutilized, there are also opportunities to document food insecurity and associated programs using standard medical code terminologies (such as Z59.41). Identifying patients within the EHR allows for tracking and monitoring, quality improvement, streamlined and efficient workflows, and evaluation of the success of the program.[26]

Screening for Food Insecurity

Although several screening tools are available, the most common is the 2-item Hunger Vital Sign™ (HVS), which has been validated for use across many different household types, including households with young children, households with only older adults, immigrant households, and numerous others.[27] Children's Health Watch has developed several policy briefs with lessons learned from implementing the HVS in healthcare settings. In addition, the American Academy of Pediatrics (AAP) and the Food Research Action Center (FRAC) have released an updated toolkit designed to help healthcare providers implement HVS in their healthcare systems.

HVS Questions

The Hunger Vital Sign™ identifies households as being at risk for food insecurity if they report that either or both of the following two statements are 'often true' or 'sometimes true' (vs. 'never true'):

- "Within the past 12 months we worried whether our food would run out before we got money to buy more."
- "Within the past 12 months the food we bought just didn't last and we didn't have money to get more."

Referrals to Food is Medicine Programs

Once a patient is identified as food insecure, it is important to ensure that referrals are made to appropriate food and nutrition resources that best meet the patient's needs and cultural preferences. Patients may be linked to onsite, community-based programs, or federal nutrition assistance resources. Actively enrolling participants onsite or in the clinic or providing a warm handoff directly to resource representatives may facilitate uptake of referrals. Referrals are also more likely to be successful if the programs are accessible and align with the patient's needs and preferences. However, simply providing patients with a list of food resources is generally ineffective because of other barriers to enrollment.

Coding for Food Insecurity in the EHR

Food Insecurity Diagnosis:

- ICD-10 Code: Z59.41
- SNOMED CT: 733423003

FIM Program:

- Home-delivered meals, including preparation, per meal: S5170 HCPCS

Linking patients to food resources, particularly those outside the healthcare system, can often pose implementation challenges (see section on Challenges and Opportunities for Partnership for more details). For example, lack of interoperability between data systems and concerns over HIPAA (the Health Insurance Portability and Accountability Act of 1996) may limit bidirectional communication between partners and create barriers to workflow integration. Despite this, there are several facilitators to successful referral implementation (see Table 1).

Table 1: Strategies to facilitate successful implementation of FIM referral systems

Strategy	Example
Identify a clinical champion passionate about supporting food security to help create systems and processes	A nurse manager is excited about the opportunity to bring more support to patients who are experiencing food insecurity. He connects with a colleague at the Department of Public Health, who can make important connections to community partners. The nurse manager is empowered to bring a proposal back to the clinical site for a food insecurity screening and referral program, in partnership with others in the community. This same nurse manager supports and champions at each stage of implementation.
Invest in strong partnerships with community-based organizations that can accept referrals and close the referral loop (e.g., communicate with the referring organization that the patient has been offered and/or received services)	The health system, the local department of public health, and the community-based organization each have a lot of work to do to create a new, functional system. These relationships take time and require a great deal of trust. Resources for implementation (see Funding Mechanisms section) can help provide the infrastructure that facilitates strong systems. Ideally, the resulting collaboration results in ongoing, bi-directional communication between the clinical site and the food provider so that nutritious food can be an integral part of the treatment plan.
Integrate screening and referral processes into existing workflows and data systems so that it causes as little additional work for clinical providers as possible	The clinic has an existing workflow for sending a "prescription" to an in-house provider of medical equipment, which clinicians are familiar with and use frequently. Rather than creating a new workflow, an option is added to this workflow to refer to an on-site food pantry. This system is easy to create in the electronic health record because the fields already mostly exist, and it is easy for clinical providers to use because it is similar to an existing, well-used process.
Train clinical providers on rationale and workflows for addressing food insecurity in the clinical setting	At the onset of implementation and then at regular intervals thereafter, the community partner is asked to attend the weekly staff meeting to discuss food insecurity rates in the community, the impact of food insecurity on health and wellness, community resources, and referral rates to community partners.

Food is Medicine Programs

Spectrum of Food is Medicine Programs

FIM programs range from providing healthy, medically tailored meals and grocery items; to providing electronic or paper prescriptions for the purchase of nutritious foods, such as fruits and vegetables; to on-site food provision in clinical settings (on-site food pantries); to referrals to local, community-based food pantries and federal nutrition assistance programs. These programs vary in intensity and level of support required from the healthcare system, with more robust, targeted services typically provided to those who have greater medical needs (e.g., home-delivered medically tailored meals for those with a severe, diet-sensitive chronic health condition, such as uncontrolled diabetes or congestive heart failure, and one or more limitations in activities of daily living) and less labor-intensive programs for patients focused on prevention (e.g., SNAP benefits or healthy food vouchers for low-income families).

Figure 2 shows a basic schema of this range of programming. There is variation in how these programs are operationalized; program duration, dose (e.g., amount) of the nutrition benefits, adjustment for household size, intensity of supportive nutrition education, eligibility criteria, and populations served all vary tremendously across different programs. This flexibility in programming allows different healthcare systems to identify and pursue their own priorities and variety of nutrition programs but can also add uncertainty as to which combination of operational features is most effective for which patients. Further, while we have categorized these programs by usual site of implementation, there is considerable variation in this as well. Several of the most salient features of different implementation models are described further below in Table 2: Food and Nutrition Program Models.

Food is Medicine Research

At the federal level, FIM implementation and evaluation programs have been initiated by USDA (through the USDA Gus Schumacher Nutrition Incentive Program, GusNIP), Centers for Medicare and Medicaid Services (CMS), Veterans Affairs, and Indian Health Service.

The Rockefeller Foundation and American Heart Association (AHA) have committed to raising $250 million for FIM research, and Kaiser Permanente has committed $50 million to this cause.

The ASPEN Institute also released a Food is Medicine Action Plan, which (1) provides an overview of the existing peer-reviewed research on FIM and federal nutrition programs; (2) outlines key considerations for FIM research; and (3) provides recommendations for future FIM research.

Finally, Feeding America and the Institute for Hunger Research & Solutions at Foodshare conducted an evidence review, which outlines the impact of programs commonly used by healthcare systems and community based programs to address food insecurity and health.

Figure 2: Intensity of Food is Medicine Services can be Tailored for Food and Nutrition Insecure Patients based on their Health Conditions and Risk

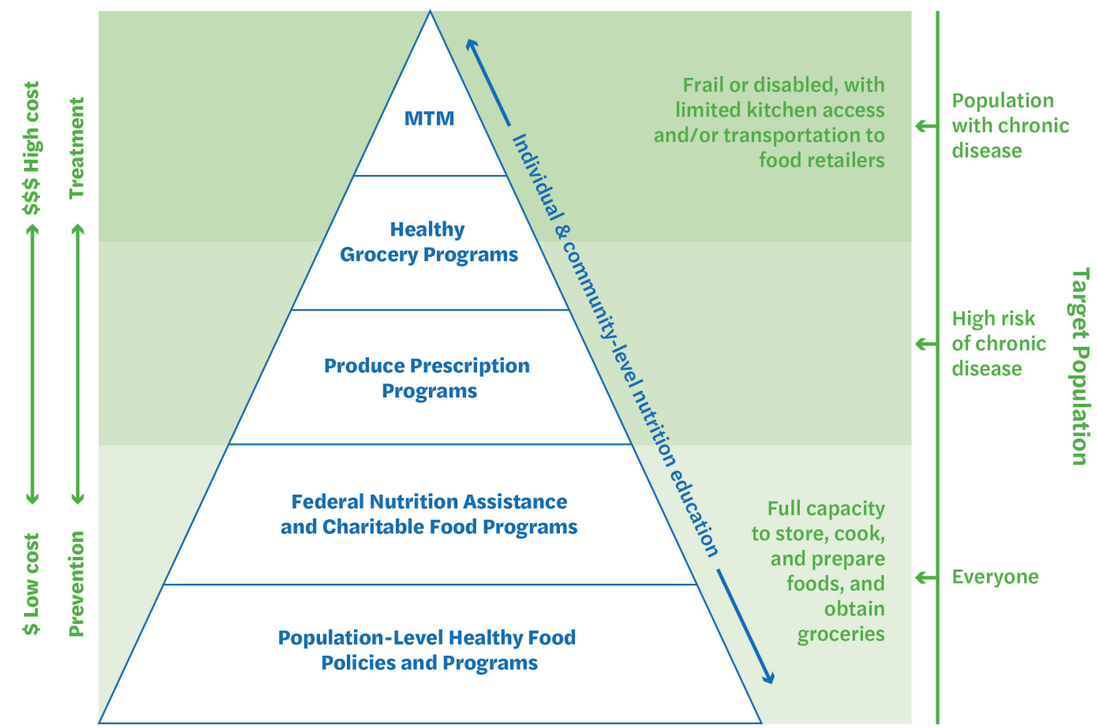


Figure adapted and updated from Mozaffarian D, Blanck HM, Garfield KM, Wassung A, Petersen R. A Food is Medicine approach to achieve nutrition security and improve health. Nat Med. 2022;28(11):2238-2240. doi:10.1038/s41591-022-02027-3.

MTM: Medically tailored meals

Table 2: Food and Nutrition Program Models

Model	Implementation	Implementation Setting & Partnerships
Medically tailored meals (MTMs)	Individuals living with complex or severe chronic illness who are too sick to shop or cook for themselves may qualify to receive MTMs, which are prepared in a central kitchen and ready to eat.	Community Healthcare systems typically partner with community-based organizations who deliver medically appropriate meals to patients following a referral by a medical professional or their health plan.
Healthy groceries (medically tailored and medically supportive groceries)	Food products for preparation at home distributed in numerous different models: • Onsite "food pharmacy" • Pop-up, mobile, or temporary food distribution • Emergency food boxes provided at clinics • Food bags provided at hospital or emergency department discharge • Healthy food box delivery	Onsite at the healthcare system or in the community Healthcare systems typically partner with community-based organizations, such as food banks, food pantries, and other community food providers, to supply and distribute food on-site at clinics or upon hospital discharge. These programs are typically implemented by health system staff.
Produce prescription programs	Typically, paper vouchers or electronic benefit cards that can be used to purchase fresh, frozen, and/or canned fruits and vegetables (will vary depending on program) at community food stores (e.g. grocery stores, farmer's markets).	Community These programs are typically implemented through a referral from the healthcare system to a community-based organization. Patients who meet specific criteria (variable depending on organization, but typically food insecure with a diet-sensitive chronic disease) are referred by their provider, clinic staff, or health plan to community-based organizations who administer these programs. Occasionally, the healthcare system will develop and implement their own produce prescription program.
Federal Nutrition Assistance Programs	Examples include: • Embedding an eligibility worker on-site in the clinic or hospital to assist patients with enrollment in WIC or SNAP • Referral to the local WIC or SNAP agency	Onsite at the healthcare system or in the community Healthcare staff may assist individuals experiencing food insecurity with applying for federal nutrition assistance programs during a clinic visit or hospitalization. Alternatively, the healthcare system may connect individuals to external agencies where they can complete an application for federal nutrition assistance.
Charitable Food Assistance	Examples include referrals to: • Food pantries • Free dining rooms • Home-delivered meals	Community Healthcare providers refer to charitable food resources, which are then administered by the community-based organization.

Medically Tailored Meals

Medically tailored meals (MTMs) are a treatment strategy to primarily address health needs among patients with severe, complex and/or chronic medical conditions. Referrals typically come from healthcare providers or insurance plans to community-based or private sector organizations that provide these services to patients. Meal plans are developed and approved by a Registered Dietitian Nutritionist (RDN) to meet the patient's specific diagnosis as well as any additional complications or comorbidities. MTMs are paired with nutrition education and counseling from an RDN. Recipients typically receive 10-21 meals (50-100% of nutrition needs) per week for a minimum of 12 weeks delivered to their homes.[28] Because MTMs eliminate the need for food preparation and can also be home delivered, this program is most appropriate for people with high burdens of disability and illness.

Healthcare systems may also choose to partner with organizations that provide nutritious meals that do not fall under the definition of "medically tailored," but can help address their patients' food insecurity and/or health needs.

There is growing research demonstrating that MTM services reduce high healthcare utilization, lower healthcare costs, increase medication adherence, reduce hospital and emergency department admissions, and support independent living (i.e., preventing nursing home admission).[29–31] For instance, in an analysis of patients in Massachusetts, those who received MTMs had an estimated 49% reduction in hospitalizations and 72% reduction in nursing home admissions compared with those who did not receive MTMs. There was also a 16% net cost

Funding Medically Tailored Meals

The Ryan White HIV/AIDS Program, originally enacted by Congress in 1990 under the Ryan White Care Act, now provides federal funding for medically tailored meals for people living with HIV or AIDS.[33] Although there are still no federal funding streams to support MTMs as a standard benefit for patients living with other chronic diseases, increasingly these services are being considered for coverage through Medicaid waivers, which allows states to use public healthcare funding to pay for medically supportive food programs. For example, Centers for Medicare and Medicaid Services (CMS) has approved Medicaid 1115 waivers in Massachusetts and North Carolina to pilot MTMs, medically tailored groceries, and produce prescriptions, along with addressing housing and other social determinants of health; and approved a Medicaid 1115/1915(b) waiver in California to provide MTMs and multiple other Food is Medicine programs as "in lieu of services."[34] New York was the first state to use "in lieu of services" to cover MTMs through their Medicaid Managed Care Organization (MMCO) benefit package.[35] Since 2020, CMS has also allowed Medicare Advantage healthcare plans to cover a range of food-based programs as Special Supplemental Benefits for the Chronically Ill (see Funding Mechanisms section for more details).

savings observed, or more than $9,000 per MTM patient per year (even after accounting for the cost of the program). Further, a recent economic evaluation of MTMs found that national expansion could avert 1.6 million hospitalizations and save $13.6 billion in net costs annually.[32]

Healthy Grocery Programs

Healthy grocery programs are typically comprised of nutritious food items designed to support patients' general health and wellbeing. Under this umbrella are also medically supportive groceries, which are "groceries with nutrient rich whole foods used as a medical treatment to address a specific health condition," and medically tailored groceries, which are "groceries approved by an RDN that reflect appropriate dietary therapy based on evidence-based practice guidelines."[36] Items may vary depending on programmatic goals, but often include fruits and vegetables, lean protein, beans and legumes, and dairy products. Healthcare system staff are generally responsible for screening and referring eligible patients to these programs. Services may occur either on-site at the healthcare system (e.g., the patient receives a referral to pick up a box/bag of groceries at the clinic), or off-site at a community location (the patient receives a referral to pick up groceries from a community-based organization or the groceries are delivered to their home).

Program Example

Food Farmacy

The Geisinger Fresh Food Farmacy partners with local food organizations to provide enough fresh produce, whole grains, and lean proteins to program participants for 10 meals per week. In addition, a multidisciplinary team offers medication management assistance, nutrition counseling, health coaching, and ongoing case management to help patients develop and sustain their lifestyle changes. The program serves patients with poorly controlled diabetes who screen positive for food insecurity. In an initial evaluation of ~100 participants treated for 18 months, significant improvements were seen in participants' hemoglobin A1c, blood cholesterol, blood sugar, and triglyceride levels.[40] Furthermore, the team has been able to track healthcare spending among 37 participating patients, with preliminary results demonstrating a net decrease in per member spending per year, even after accounting for the cost of the program. Based on this success, Geisinger has extended the program and built three brick-and-mortar food pharmacy locations across their system, currently serving about 600 patients with fruits, vegetables, whole grains, and lean proteins every two weeks.

Many healthcare systems host on-site programs to support patients who meet eligibility criteria defined by the healthcare system. One example is a food pharmacy. Food pharmacies (or "farmacies") are typically operated on-site by clinics or healthcare systems in partnership with local or regional food banks who supply the healthy food items. They may also operate as a mobile food distribution program where a truck (typically operated by the local food bank) distributes healthy food on-site during designated time periods. In addition to providing healthy food items, food pharmacies often provide patients with nutrition and culinary education and counseling, as well as resources to help manage their disease condition (such as diabetes self-management education; see box Food Farmacy for a program example). There is growing evidence that food pharmacies can lead to improvements in nutrition knowledge and decrease barriers to healthy eating. A recent systematic review found that food pharmacies can improve fruit and vegetable intake and reduce food insecurity. However, evidence was inconsistent and many studies were not very rigorous in their design.[37] Additionally, no studies have directly compared this model's overall effectiveness with other FIM programs.[38]

Role of State or Local Health Agency or Public Health Department

State and local health agencies, public health departments, and other public health allies can play a vital role in the implementation of food and nutrition security programs, including facilitating and coordinating partnerships between organizations, connecting to funding opportunities, and providing access to resources (such as data), program infrastructure (including staffing), written and online recruitment materials, and evaluation support.

Unlike MTMs, participants in these programs must be capable of cooking and preparing their own meals with the raw ingredients provided. Although more labor-intensive for participants, this program may offer more flexibility for patients to choose preferred foods and prepare culturally appropriate meals. However, participants may still be limited in their choices if they are provided with a box of pre-selected groceries.

Healthy grocery programs can be less expensive in comparison to MTMs, which allows for a greater number of participants to be served. However, as a less intensive program that requires food pick-up and preparation, healthy grocery programs may not provide the same impact as home-delivered prepared meals. For example, a recent systematic review suggests that medically tailored groceries improve food security but inconsistently affect other outcomes.[39] The variability in findings likely reflect large differences in the "dose," duration, and ancillary services (such as cooking and nutrition education, etc.) included in the programs tested, as well as differing degrees of methodologic rigor in the studies.

Produce Prescriptions

Produce prescription programs are designed to augment prevention efforts and chronic disease treatment plans by providing individuals and families with prescriptions for fruits and vegetables. Produce prescriptions are typically distributed by or in partnership with health clinics through paper vouchers or electronic benefit cards to individuals diagnosed with a diet-related

Program Example

Produce Prescription Program

Community Outreach and Patient Empowerment (COPE), the Navajo Nation-based site of Partners in Health, leveraged CDC REACH funding (along with other funding sources) to start a produce prescription program known as FVRx. The Navajo FVRx program partners with healthcare providers and local retailers to promote healthy eating by providing families with a monthly voucher to purchase fruits and vegetables at local stores on Navajo Nation. Clinic providers and community health workers identify eligible families to participate in the program. In addition to a monthly prescription for produce, families meet with a community outreach worker each month to learn about healthy habits. More information about the program's reach and impact can be found here.

chronic condition, such as diabetes (or pre-diabetes), hypertension, obesity, or heart disease. Sometimes, but not uniformly, produce prescriptions include eligibility criteria related to income status and/or food insecurity.

Although typically aimed towards treatment of individuals with a diet-related chronic disease, produce prescription programs may also be appropriate for prevention, for example in high-risk individuals. A simulation analysis suggested that produce prescriptions can also improve health and be cost-effective for the general population—including people who are currently healthy – to support better dietary habits and improved long-term health.[41]

Prescriptions can be redeemed for produce at participating vendors, such as grocery stores, corner stores, farmers markets, or farm stands (some programs offer Community Supported Agriculture (CSA)[b] boxes to patients receiving a produce prescription). Occasionally prescriptions can be exchanged for produce on-site at the clinic or hospital or offered via delivery model.

A wide range of produce prescription programs have been implemented that differ considerably in eligible population, duration, and benefit amount,[43] although most programs are locally developed and administered. The Produce Rx Evaluation and Policy Collaborative has developed a 'Promising Practices' document to help implementers in planning and evaluating produce

b Community Supported Agriculture (CSA) is a system that allows consumers to purchase food directly from famers by pre-paying for a subscription of produce.[42]

Food is Medicine Programs

prescription programs. For those living in rural communities, Share our Strength has recently released a produce prescription toolkit specifically designed for those who are planning and operating these programs in rural areas.

Examples of National Produce Prescription Programs

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) can be considered an example of a national produce prescription program. WIC provides money for healthy food, nutrition education, and breastfeeding support to pregnant, postpartum, and breastfeeding individuals, as well as children ages 0-5 years. As part of the WIC food package, participants receive a WIC Cash Value Voucher/Benefit (CVV/B). The CVV/B was first introduced to the WIC food package in 2007 as part of an effort to increase its nutritional content. It was more recently expanded during the COVID-19 pandemic and provides participants money to purchase fruits and vegetables as part of their WIC food package.[44] WIC benefits, particularly with recent changes to the list of approved foods, are associated with improvements in perinatal diet quality, maternal health, and child health.[45,46]

The USDA's Gus Schumacher Nutrition Incentive Program (GusNIP) also supports a national produce prescription program network, by funding the implementation of various heterogeneous produce prescription programs across the U.S. (as well as a separate, nutrition incentive program that offers a dollar match for produce purchased by households with SNAP dollars).[47] However, in contrast to the CVV/B program which is available to all WIC participants, federal funding for GusNIP is time limited and insufficient to reach many eligible people in the U.S.

The National Strategy on Hunger, Nutrition, and Health also mobilized a number of national, Food is Medicine pilot programs. Congress recently authorized the Indian Health Service (IHS) to create a Produce Prescription Program for American Indian and Alaska Native (AI/AN) communities. The US Department of Veterans Affairs (VA) and the Rockefeller Foundation also announced that they will be partnering to expand Food is Medicine programs, including medically tailored meals and produce prescriptions programs, at a number of VA facilities across the country.

Growing research suggests produce prescription programs improve dietary intake, food security, and health outcomes. A recent systematic review of 17 studies found that participants (defined as those who received a produce prescription or food box with fresh fruits and vegetables) increased their intake of fruits and vegetables by an average of 0.77 servings per day and reduced their BMI by an average of 0.4 kg/m2.[48] Most of these studies, however, lacked rigor in their methodology. Modeling studies suggest positive downstream impacts on health outcomes and healthcare costs.[41]

Federal Nutrition Assistance Programs

Federal Nutrition Assistance Program Outreach and Enrollment

Although not traditionally thought of as FIM programs, federal nutrition assistance programs such as SNAP, WIC, and the National School Lunch and Breakfast programs are population-based programs that provide food or money for food to millions of low-income households each year. As the largest and most effective federal nutrition assistance program in the U.S., SNAP plays a crucial role in mitigating food insecurity and lifting families out of poverty. SNAP improves health and lowers healthcare costs; however, poor health outcomes and health disparities among adults participating in SNAP persist.[49–53] Healthcare systems can play an important role in screening and referring patients to federal nutrition assistance programs. These programs can be an important part of strategies to address social determinants of health. Examples of strategies to facilitate enrollment include:

- Developing provider education, clinical practice guidelines, and EHR fields for screening for food insecurity.
- Having an on-site enrollment specialist (or eligibility worker) for referrals and direct application assistance for eligible patients who screen positive for food insecurity. For example, healthcare staff can provide referrals to on-site, trained food bank staff and volunteers who can directly assist patients with completing a federal nutrition program application.
- Educating healthcare staff, such as community health workers, promotoras, social workers, RDNs, and health navigators, about program eligibility requirements and how to connect potentially eligible patients to a community partner (e.g., food bank, social service agency, or community food program) who can assist them with the application.
- Directly referring patients to the local SNAP or WIC office. However, evidence suggests a referral—in the absence of any additional support—is usually insufficient to meaningfully increase enrollment.[54]

Program Example

SNAP Enrollment

Through a partnership with the University of California San Diego (UCSD), the San Diego Racial and Ethnic Approaches to Community Health (SDREACH) developed a campaign to raise awareness about the ¡Más Fresco! More Fresh Program (a nutrition incentive program for SNAP recipients) and to enroll more SNAP recipients in Southeast and Mid-City San Diego. SDREACH and UCSD developed and promoted social media and Google search ads in English and Spanish. The social media campaign raised awareness and engaged the community around nutrition access. The target audience included African Americans/Blacks and Latinx women. The campaign ran April -June 2021 and resulted in 913 new enrollments in the ¡Más Fresco! More Fresh Program in San Diego County.

Food is Medicine Programs

Federal Nutrition Assistance Programs

SNAP

Administered by the USDA, SNAP (formerly food stamps) is the nation's largest nutrition assistance program. SNAP provides low-income households with monthly dollars (via an electronic benefits transfer card) to support retail food purchasing at supermarkets, grocery stores, farmers markets, and online. Within SNAP, additional nutrition incentive programs in GusNIP (also commonly implemented as DoubleUp Food Bucks or Market Match programs) provide households who receive SNAP with additional dollars to purchase healthy foods, which are typically fruits and vegetables, but may also include dairy and whole grain products.

WIC

WIC provides healthy food and nutrition education to low-income pregnant and post-partum women, infants and children. WIC also provides an additional cash value benefit (CVB/CVV) for families to purchase fruits and vegetables, in addition to their standard WIC package. Some Market Match programs provide WIC participants with incentives to purchase additional fruits and vegetables by matching their benefits (up to a certain dollar amount) when they spend at local farmers markets or farm stands.

Food banks can partner with and support healthcare systems to facilitate federal nutrition program enrollment by supporting clinic staff education and training on application and/or referral processes. Food for Tomorrow: SNAP Application Assistance in Healthcare Settings provides detailed guidance for implementing this type of program.

Programs Supported by the Charitable Food System

The charitable food system, in particular regional food banks and local food pantries, are increasingly recognized as important partners for healthcare systems seeking to promote food security. Food banks are non-profit organizations responsible for sourcing and storing food, which is then typically distributed to food pantries who provide the food directly to clients. Many food banks and pantries have deep connections to their community and a strong understanding of local opportunities and barriers to addressing food insecurity. As a result, many healthcare systems partner with food banks and food pantries to develop strategies and programs to connect patients who screen positive for food insecurity to food-related resources.

Feeding America has developed several resources and evidence review designed to understand and facilitate food bank-healthcare partnerships.[55] On-site programs include food pantries located in the clinic or hospital. Off-site programs may include referrals to a community-based food pantry, mobile food distribution outside the healthcare setting, or congregate meal programs. Outside of the healthcare system, food banks may also address health directly at

their food distribution sites by hosting health screenings, facilitating health insurance and other health benefit applications, and offering healthier foods through the implementation of nutrition guidelines and nudges.

Although these types of programs are growing in popularity, research on their health impact is limited. In addition, many of these programs have traditionally focused on food security (providing pounds of food), and less so on nutrition and health, but this is changing with most food banks now prioritizing better nutrition an important goal and metric of success.[56] For example, many food banks now adhere to nutrition standards, such as the Healthy Eating Research Nutrition Guidelines for the Charitable Food System, and implementation programs, such as Supporting Wellness at Pantries (SWAP), to ensure availability of nutritious, culturally preferred foods and increase their uptake.

Challenges and Opportunities for Partnership

Despite growing recognition and momentum to address food insecurity as a health issue, several barriers exist to successful implementation of programs to tackle this challenge. Once food insecurity has been identified, healthcare systems are tasked with finding resources and creating referral workflows. Some program operators lack the expertise to integrate these programs into existing clinical workflows. Many healthcare systems lack a formal list of all available resources for food in the community, do not have a standard process for tracking and closing referral loops, and lack coordination with external community-based organizations. Some electronic health systems do not support easy tracking of food insecurity screening results. Electronic health systems are rarely able to communicate directly with state agencies administering SNAP, WIC, and other federal nutrition programs. Thus, as with other programs, it can often be difficult, especially at scale, to track referral closures or health impact once patients are sent outside the healthcare system for services.

To overcome challenges, many healthcare systems and community based organizations are now investing in technology that can aid in the coordination and tracking of patient referrals to food resources in the community (see box Example Technology Platforms for Community Referrals).[57,58] When local solutions are implemented piecemeal, however, the capacity burden often falls on community-based organizations who may be asked to participate in multiple technology platforms with no standardization. CDC has a pilot project in North Carolina that has created data linkages between WIC and healthcare, but it is currently a proof-of-concept initiative.

Other barriers to successful FIM implementation include a lack of long-term investment and a reliance on short-term funding. This can result in a shortened program duration, limiting the impact of the program. Referrals may also be limited by a fragmented and inadequately funded social safety net.[18] Finally, many organizations lack the expertise to navigate complex federal healthcare regulations, so concerns over compliance often preclude many smaller community-based organizations from participating in these types of programs.[59] Data sharing agreements between healthcare systems and community partners and HIPAA compliance requirements are important considerations and are discussed later in this report. Healthcare systems should assess and address these potential local barriers.

On the positive side, healthcare systems and payers often place emphasis on programs that demonstrate the greatest return on investment (ROI). Growing research suggests the ROI for FIM programs may be similar to or larger than for many other existing healthcare system programs, especially over longer timeframes and when access to programming is for a longer duration.[41]

Common Implementation Challenges for Healthcare Systems

- Insufficient funding for program administration and quality improvement
- Lack of staff capacity or time
- Burden on providers of screening and referring for food insecurity, particularly when there are inadequate systems and workflows in place
- Lack of provider training/knowledge of screening for food insecurity and available programs
- Lack of reimbursement for nutrition programs
- No existing quality indicators/quality improvement metrics associated
- HIPPA concerns about sharing data with community-based partners
- Lack of bidirectional communication between healthcare system and community FIM providers
- Cost of technology to efficiently administer program and track data

Example Technology Platforms for Community Referrals

- Activate Care
- findhelp (formerly Aunt Bertha)
- Now Pow
- One Degree
- United Way 211
- Unite Us

Please note that this is not a comprehensive list of social service referral platforms. See SIREN resource guide for healthcare organizations on community resource referral platforms for more details about the current landscape, and for recommendations on how to implement a community resource referral platform.

Community-Level Food & Nutrition Security Assessment

Background
Food is Medicine Programs
Community-Level Food & Nutrition Security Assessment
Building Support for Food is Medicine Programs
Evaluation
Funding Mechanisms
Conclusions
References & Appendix

Every three years, non-profit hospitals are required to conduct a community health needs assessment (CHNA) and adopt an implementation strategy to meet the needs identified during that process. This report provides guidance for how hospitals, public health departments, food policy councils, and community-based organizations in your community can work together to leverage a limited number of resources to address food insecurity.[60]

Whether part of a formal CHNA process or not, additional data, not directly collected by the healthcare system, can be an important part of informing a community's needs assessment and program planning. Much data on community food security, the food environment, and diet-related health is publicly available (or can be made available to qualified researchers upon request) (see Table 3 below). Local health departments often collect or have access to additional data that may serve as an important part of any assessment or evaluation. These measures can provide important context and a broader understanding of the community's food environment and support the design of more effective programs. Healthcare practitioners can use the assessment data to help determine which type(s) of Food is Medicine program might be most appropriate for their community and partners.

Table 3: Public Data Sources and Measurement Tools for Health Systems to Assess Food and Nutrition in Their Community

Database/ Measurement Tool	Description	Example Metrics
Behavioral Risk Factor Surveillance System (BRFSS)	State data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services.	Health status Quality of life (CDC Healthy Days) Health care access Physical activity Fruit and vegetable intake
Child Opportunity Index (COI) 2.0	Neighborhood resources and conditions that matter for children's healthy development, including a summary measure of the quality of neighborhoods children experience. COI 2.0 includes 29 indicators including access and quality of early childhood education (ECE), high-quality schools, green space, healthy food, toxin-free environments, and socioeconomic resources. The 29 indicators are grouped into three domains: education, health and environment, and social and economic.	Access to healthy food Childcare access Elementary school students' eligible for free or reduced-price lunches

Database/ Measurement Tool	Description	Example Metrics
Community Commons	Database and mapping tool that includes a Community Health Needs Assessment (CHNA) tool and Vulnerable Population Footprint tool. Data available at the county level or by customizable geographic boundaries.	Population below poverty level (Vulnerable Population Footprint) Health behaviors, health outcomes, food environment, Area Deprivation Index (ADI), population receiving SNAP (CHNA tool)
County Health Ranking and Roadmaps	County level data on a number of health measures. This resource provides a snapshot of what is happening in your community, allows you to look at changes over time, and allows you to compare the health of your county to other counties.	Quality of life (CDC Healthy Days) Access to care
Feeding America: Map the Meal Gap	Food insecurity rates and income eligibility for federal nutrition programs at the county, congressional district, and state level.	Food insecurity rate % of food insecure population ineligible for federal nutrition assistance Food budget shortfall (in dollars) Average meal cost (in dollars) Racial disparities
Nutritional Environment Measures (NEMS) Survey	Community and consumer nutrition environments in grocery stores, corner stores and restaurants. Measures focus on availability of healthy foods, prices, and quality. These tools are often adapted for local use, including assessment of state WIC approved foods.	Perceived nutrition environment (food shopping, home food environment) Store and corner store measures (availability and pricing differences between more and less healthy options)
PLACES	A collaboration between the CDC, Robert Wood Johnson Foundation and the CDC Foundation showing the burden and geographic distribution of health-related outcomes. Intended to assist in planning public health programs. Provides model-based population-level analysis and community estimates for all counties, places (incorporated and census designated places), census tracts, and zip codes in the US.	Physical and mental health Chronic disease, including obesity

Database/ Measurement Tool	Description	Example Metrics
USDA Food Access Research Atlas	Food access indicators for low-income and other census tracts using different measures of supermarket accessibility. Also provides data on neighborhoods' access to food stores that offer a variety of healthy and affordable food.	Population with low income and low access to healthy food
USDA Food Environment Atlas	Maps to visualize food access indicators by census tract and select subpopulations.	National School Lunch Program, School Breakfast Program, and Summer Food Service Program participation Federal nutrition assistance (WIC, SNAP, CACFP) participation and redemption FDPIR sites[c] Grocery store access, proximity, availability Restaurant availability, expenditures Obesity rates
USDA Food Security Status of US Households	Official food insecurity rates for the US overall, for some sub-populations, and by state, released annually.	Prevalence and severity of food insecurity among US households
Youth Risk Behavior Surveillance System (YRBSS)	Health behaviors, conditions, and experiences among high school students, grade 9-12. The system includes a national Youth Risk Behavior Survey (YRBS), conducted by CDC, and state, local school district, territorial, and tribal school-based YRBSS. YRBSS is designed to monitor priority health risk behaviors. Some states include a food security question in their survey.	Fruit and vegetable intake Sugar sweetened beverage intake

c Food Distribution Program on Indian Reservations (FDPIR)

Building Support for Food is Medicine Programs

Background
Food is Medicine Programs
Community-Level Food & Nutrition Security Assessment
Building Support for Food is Medicine Programs
Evaluation
Funding Mechanisms
Conclusions
References & Appendix

Improving food and nutrition security within the healthcare system requires commitment from multiple stakeholders. When designing a FIM program, it is important to build engagement from key partners starting at the earliest stages. For example, tracking clinical data through the EHR is highly beneficial when it can be done, but working with EHR systems is complex and requires buy-in from many partners.

Many successful FIM programs have started with support from a coalition whose goal is to reduce food and/or nutrition insecurity in the community. Coalition partners often include state and local public health departments, community and faith-based organizations, academic institutions, healthcare systems, and industry/private companies. Local food policy councils and equity task forces also frequently participate, and in many cases drive, these coalitions.

Examples of two national coalitions in this space include the Food is Medicine Coalition (FIMC) and the National Produce Prescription Collaborative (NPPC).

Example Activities for Coalitions

- Champion adoption of metrics, standards, and processes related to local food and nutrition security across the community;[61]
- Encourage and participate in federal, state, and private research investments to advance nutrition security;[62]
- Advance non-profit and business innovation in allied organizations that provide nutrition security services;
- Promote coordination of federal, state, and local food policies and funding more broadly.[7]
- Promote coordination of programming across sectors: healthcare, community-based organizations, state agencies for enrollment in federal nutrition assistance, small businesses (e.g., corner stores), retail (e.g., grocery stores), and local agriculture

The Agency for Healthcare Research and Quality (AHRQ) has developed a library of resources for organizations interested in planning and developing clinical-community partnerships.

Evaluation

Background
Food is Medicine Programs
Community-Level Food & Nutrition Security Assessment
Building Support for Food is Medicine Programs
Evaluation
Funding Mechanisms
Conclusions
References & Appendix

Evaluation of food and nutrition security programs is critical to building a robust evidence base to support adaptation, adoption, and expansion of these services. The collection of data is also essential to quality improvement efforts that ensure successful, equitable programming. The Aspen Institute recently released a comprehensive assessment of the FIM research landscape and recommendations for future evaluation needs.[63] Evaluation planning should occur at the earliest stages of the program planning process to ensure that healthcare systems and partners are collecting the data necessary to understand the impact of the program and, notably, appropriately account for evaluation costs in the budget development process. The greater the scope and complexity of an evaluation, the greater the cost. It is important for programs to strike the right balance between meeting program and evaluation needs and the feasibility of data collection and analysis with limited funds.

Information collected during the evaluation can help healthcare systems and their community partners improve collective efforts and drive future decision making. It can also identify best practices in different contexts and communities. Programs can more effectively and efficiently address equity if participant and community perspectives and priorities are assessed and included from the early stages of design.

The CDC has developed a comprehensive toolkit that outlines steps for creating an effective evaluation plan. Kaiser Permanente has also developed a "population dose" approach (including a toolkit) that supports healthcare systems in measuring impact and developing strategies for creating high impact programs that will maximize population health. The GusNIP Nutrition Incentive Program Training, Technical Assistance, Evaluation, and Information Center (NTAE) publishes a series of metrics that can be used to align evaluations of produce prescription programs.[64]

Data Collection and Reporting

Data is often collected by surveys, interviews, or the EHR to assess program implementation (process metrics) and impact (outcome metrics). When developing a data collection plan, practitioners should consider the priorities of the organization as well as the need to minimize patient burden. Table 4 below describes the advantages, disadvantages, and metrics that can be collected using different modalities.

Gathering feedback directly from community members and local partners, and engaging them in the decision-making process, both enables program evaluation and supports successful and equitable programs. This engagement should also begin early in the design process. Change Lab Solutions has developed guidance for community partnerships and community engagement.

Evaluation

Table 4: Methods of data collection

Method	Data Types	Frequency of data collection	Metric examples	Advantages	Disadvantages
Surveys	Individual level data obtained directly from participants Self-reported measures	Typically administered at two time points (pre- and post-enrollment) or three time points (pre-, mid-point, and post-enrollment). In addition, surveys can be administered several months after enrollment to assess maintenance of effect.	Food security, nutrition security, diet quality (e.g., fruit and vegetable intake via screener), quality of life, program adherence, and program satisfaction	Can be administered in-person, over the phone, text message etc. Provides information on nutrition and health behaviors that are not typically captured in the EHR	Greater participant burden Can also be high burden for staff Limitations in participant recall and participant concerns about providing negative feedback
Qualitative and key informant interviews, focus groups	Data can be collected either formally or informally from participants, program implementers, and/or community partners to better understand program implementation and participant experiences	Typically conducted after program completion but can be conducted at any timepoint depending on evaluation goals. For example, programs may choose to conduct interviews with participants during the pilot phase of a program to gather rapid feedback and make improvements. Or, programs may choose to conduct feedback during the development stage to assess community strengths, needs, and priorities.	Program satisfaction, barriers and facilitators affecting outcomes, implementation strengths and opportunities	Opportunity for participants and stakeholders to provide feedback and an in-depth description of their experience that cannot be captured in a survey	Time intensive More burdensome on the participant
Electronic Health Record (EHR)	Individual-level data extracted from the patient's electronic health record (e.g., lab values, such as HbA1c, from participants with diabetes who participated in a program; healthcare utilization) Aggregate or summary data of specific health metrics (e.g., average HbA1c from all participants before and after program, or average HbA1c from those who participated in program compared to those who did not, or average HbA1c in the clinic before program implemented vs. after program)	Data continuously collected via usual healthcare system activities. Data typically analyzed at two time points, pre- and post-program participation, to assess clinical impact.	Food security status assessed during clinical screening; HbA1c, blood pressure, body mass index (BMI); utilization data, such as hospitalizations, nursing home use, and emergency room visits	Allows for tracking of clinical outcomes, which can be used to demonstrate program effectiveness	May not align with exposure to program, complicating interpretation of results Only captures the care that is provided during a patient visit and/or that is prescribed by the physician Data sharing/HIPAA concerns if working with an external partner Data extraction can be complex
Administrative claims databases	Encounter and patient level healthcare utilization and expenditures	A set of standardized codes to describe specific diagnoses, procedures, and medications are routinely submitted by healthcare providers to payers (e.g., insurance companies, Medicaid, and Medicare) for billing purposes	Utilization (such as hospital admissions, emergency department visits, and nursing home admissions), and expenditures (such as total cost-of-care, out-of-pocket spending)	Can be used to establish impact on costs/return on investment of a program	Only captures information on insured patients May require considerable time and expertise to access Highly technical Cost data for people in capitated insurance plans may be uninterpretable

When designing an evaluation plan, it is important to determine who is responsible for tracking and collecting data. Data may be collected by the organization delivering the meals or produce (e.g., through enrollment and follow-up surveys), by the healthcare system (e.g., through the EHR), or by a partnering community-based organization (e.g., through community surveys). Because the balance of health outcomes data is held by healthcare systems and providers, much of the responsibility for outcomes evaluation will naturally rest with the payer or provider. However, many programs may also choose to involve an academic institution or other third-party evaluator who can lead the design of the evaluation, and work with implementing agencies to collect data, perform analyses, and disseminate results. The development of any evaluation framework should be participant-centered and focus on promoting equity.

Metrics

A consistent set of shared metrics allows programs to measure, evaluate, and compare progress with other programs over time.[64] FIM programs can differ in local context, scope, design and methodology depending on program goals, time, resources, and capacity. While not all programs have the ability or need to measure all metrics, common measures are important for comparison across programs and pooling of data from multiple programs to create large datasets with robust capacity to examine outcomes.[64]

Evaluation Using Core Metrics

The Nutrition Incentive Hub, created by the GusNIP Training, Technical Assistance, Evaluation, and Information Center (NTAE), is a coalition of partners that supports the implementation and evaluation of nutrition incentive and produce prescription projects funded by the USDA. The NTAE has developed a core set of participant metrics to measure the impact of these programs on participant behaviors and outcomes and to track program processes. These metrics were chosen based on measure validity, reliability, and ability to assess impact. The Gretchen Swanson Center for Nutrition has also developed a new set of metrics to assess nutrition security.[65] The Center for Health Law Policy and Innovation (CHLPI) has further expanded these core metrics to include additional clinical and utilization metrics that may help further demonstrate programmatic impact on health outcomes. Although designed to measure the impact of produce prescription programs, many of these same metrics apply to other FIM programs.

Using Validated Instruments and Measures

Regardless of what a program chooses to evaluate, it is important, where possible, to use validated instruments and measures. This promotes standardization across studies, allows for benchmarking and comparison to other programs, and adds credibility to the evaluation. There are tools available that can help evaluators find validated instruments and measures:

- Core and optional metrics from the Gretchen Swanson Center GusNIP Training, Technical Assistance, Evaluation, and Information Center (NTAE)
- Center for Health Law and Policy Innovation Recommended Metrics
- PhenX toolkit
- NIH PROMIS database
- National Cancer Institute, Register of Validated Short Dietary Assessment Instruments

Process Metrics

Process metrics are an important part of any evaluation framework and all quality improvement efforts. They help us understand the steps that lead to a program's success or failure. Tracking process metrics are also essential for systematizing and scaling a program and can be important indicators for helping to understand what does and does not work in different populations or settings.

Example Process Metrics

Although the metrics chosen will vary by program, examples of process metrics include:

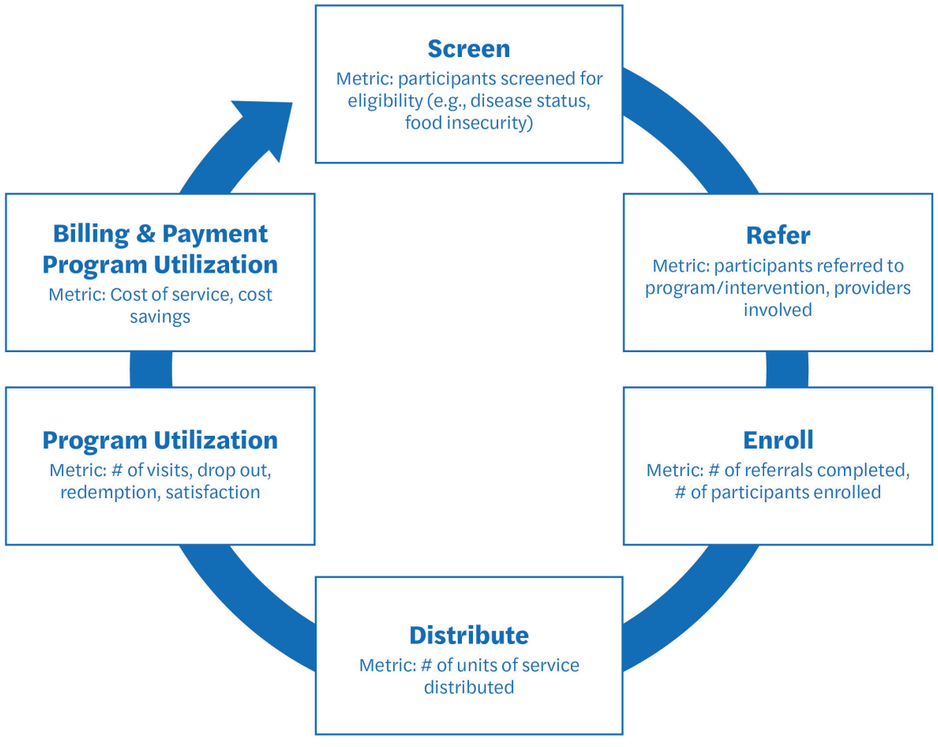
- Number of participants screened for eligibility
- Number of participants referred to FIM program
- Number of providers screening and referring patients
- Referral completion rate
- Number of participants enrolled or served
  - Program engagement
  - Number of patient visits (overall and unique)
  - Average number of visits per household
- Redemption rate
- Participant retention/Percentage of participants who take advantage of the entire program
- Participant satisfaction
- Cost of implementation (important component of measuring cost/benefit of a program and understanding return on investment (ROI))
- Program accessibility (e.g., challenges/barriers to program participation)

The Aspen Institute's Food is Medicine Research Action Plan also provides a list of recommended process and engagement metrics.

Example metrics for measuring program utilization

Produce prescriptions	Prescription redemption; Average amount spent with prescription each month
Medically Tailored Meals	Number of meals distributed per week
Healthy groceries or food pharmacy	Pounds of food distributed overall and per household (number of meals served based on Feeding America calculation)

Together, these metrics provide organizations and healthcare systems a way to assess important aspects of the program design and implementation to identify challenges, successes, and areas for improvement. These metrics can also contribute to a total 'Value on Investment,' a measure which moves beyond traditional health and cost return on investment (ROI) to recognize other factors that contribute to program success, including patient and provider satisfaction, retention/engagement, and utilization.



Outcome Metrics

Outcome metrics are designed to measure the impact of the program. Outcomes will vary depending on programmatic goals, target population, and capacity to track and report metrics and measures. Some outcomes will be self-reported via participant surveys; others, such as clinical and health data, may be collected directly from the EHR (see Data Collection and Reporting section above). EHR data can be an important part of demonstrating the links between addressing nutrition security and health but may require additional data sharing agreements and the navigation of HIPAA compliance requirements (data sharing and patient privacy are discussed in the Data Sharing section, below).

Outside of the EHR, measures of fruit and vegetable intake are important tools for assessing the impact of FIM programs. Given the well-established association between fruit and vegetable intake and chronic disease prevention, implementers should prioritize collecting data on fruit and vegetable consumption, which can be achieved using relatively low participant burden surveys (see Appendix for more details about measuring dietary intake).

Example outcome metrics

- Patient centered metrics such as quality of life (QOL)
- Food security
- Nutrition security
- Diet quality
- Fruit and vegetable intake
- Health outcomes, such as HbA1c, blood pressure, or weight
- Healthcare utilization, such as hospitalizations, nursing home admissions, ER visits, and medication use

Typically, these metrics are collected via participant surveys. However, some or all may be collected directly by the health system and tracked in the patient's EHR.

See Appendix for a more detailed description of each of these metrics.

Quality Improvement vs. Research

When creating an evaluation plan, keep in mind distinctions between quality improvement and research. Quality improvement (QI), an integral part of any healthcare systems' basic operations, can be defined as "systematic, data-guided activities designed to bring about immediate improvements in health delivery in particular settings."[66] QI methods should be used to assess all programs, including FIM programs. In comparison, research can be defined as "a

systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge."[66]

There is often overlap between QI and research, and these activities frequently occur in tandem. However, it is necessary to be aware of which activities constitute QI and which research because the latter (unlike QI activities) require the oversight of an Institutional Review Board (see next section for more details). A 2006 Hastings Center report delineates the differences between QI and research and describes the ethical considerations for conducting QI activities.

Institutional Review Boards

Institutional Review Boards (IRBs) are entrusted with protecting the rights and welfare of people recruited to participate in research activities. Typically affiliated with a university, medical institution, or governmental agency, IRBs are responsible for ensuring research participants are adequately protected. Organizations engaged in FIM programming may be required to obtain approval from an IRB if the evaluation activities are considered "research" involving "human subjects." For IRB reviews, there is often a significant distinction between research intended to evaluate an ongoing, independent clinical program in the healthcare system or community (i.e., a program that would occur regardless of the research), versus research that incorporates the clinical program

Considerations for working with EHR data

While there is considerable interest in tracking clinical data among healthcare systems engaged in FIM programs, working with EHR data is a complex task that requires buy-in from all partners and the necessary infrastructure to access such data. Embedding program workflows into the EHR, including the use of medical codes to document program activities, can benefit the provider, health system, and evaluators. Consideration should also be given to who the primary implementer is when considering whether to use EHR data. Since EHR data triggers privacy laws and the need for strict data sharing agreements (see Data Sharing section below), obtaining EHR data may be easier for healthcare partners that are implementing FIM programs within the walls of their system. Healthcare systems may have limited staff capacity or funding to extract and collate EHR data for community partners when they are the lead implementers or for academic evaluators.

While EHR data have many attractive features, such data are not generally uniformly collected for every outcome in every patient. Instead, data collection is subject to differences in timing and frequency of clinical visits, underlying patient illness, and physician practice. For example, HbA1c or lipid testing may only be measured in higher risk patients, by certain clinics or providers, or under certain clinical circumstances. This creates complexities in the analysis that can bias conclusions about the impact of the program. Evaluators using EHR data should consider these issues carefully in partnership with experienced investigators.

(i.e., the program is only occurring as part of the research project). Because the former is common for many FIM programs occurring as partnerships between healthcare systems and community partners, evaluators must be clear with the IRB about which aspects of the program are occurring as part of an ongoing clinical program (for example, distribution of a produce prescription), and which are occurring only as part of research (for example, distribution of a survey). The goal of the IRB is to ensure that any research being conducted is ethical and has a proper plan in place to comply with the laws and regulations designed to protect human subjects, including the collection and sharing of protected health information (PHI). Implementers should consult with their evaluator and/or IRB experts early in the planning process to determine need for obtaining IRB approvals.

HIPAA Compliance and IRB Resources

- Nutrition Incentive Hub Guide to IRBs
- Food Banks as Partners in Health Promotion: Navigating HIPAA
- Nutrition Incentive Hub Guide to the Health Information Portability and Accountability Act (HIPAA)

Data Sharing

Organizations that are collaborating on a project may choose to enter into a data sharing agreement. These agreements indicate who is authorized to view raw evaluation data, what can be done with the data, and how data should be properly stored. These agreements help protect participant privacy and ensure that data is being handled securely. It is important to understand when and how the rules of HIPAA and state privacy laws apply to project partners and activities. HIPAA regulations require healthcare providers, organizations, and their business associates to implement safeguards that protect the privacy and security of patient's protected health information (PHI). One of the first steps in developing a FIM program should be a review of privacy rules and the actions needed to ensure compliance. While this can be a complicated and technical process, there are several resources available to help organizations navigate these rules. If you are conducting research, it is helpful to consult with your IRB to determine if HIPAA applies to your project to ensure the necessary security measures are in place.

Funding Mechanisms

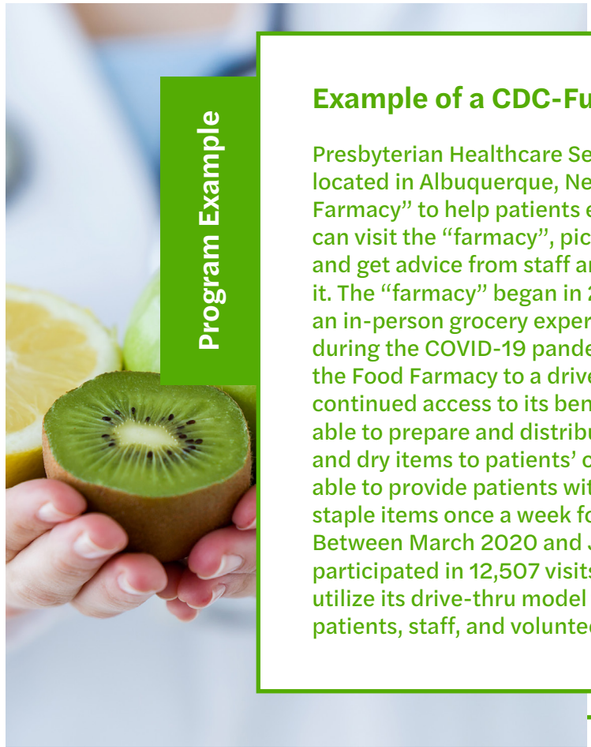
Background
Food is Medicine Programs
Community-Level Food & Nutrition Security Assessment
Building Support for Food is Medicine Programs
Evaluation
Funding Mechanisms
Conclusions
References & Appendix

Grant Funding

Finding the financial and personnel support necessary to develop partnerships between community-based organizations and healthcare is critical to developing and operationalizing most FIM programs.[67] Traditionally, nutrition security programs have heavily relied on grant-based funding or philanthropic sources, which can come from foundations, non-profit organizations, government agencies, health departments, or healthcare systems and insurers, among others. Depending on the nature of the grant, funding may be used to cover a variety of implementation activities including meal/food benefit costs, administrative costs, implementation costs and staff salaries, evaluation activities, and/or marketing and promotion. While grant funding is an important form of support for many FIM programs, there is often a long timeline for applications to be completed and reviewed, and granting can be limited in scope (e.g., what the funds can be used for and for which target populations), making it a challenge to develop a sustainable funding stream. Further, changes in grantmaker priorities and populations of interest may limit the viability of those sources of support.

CDC

The Centers for Disease Control and Prevention (CDC) Division of Nutrition, Physical Activity, and Obesity (DNPAO) funds state and local health departments, tribal organizations, universities,



Program Example

Example of a CDC-Funded Program

Presbyterian Healthcare Services, a CDC REACH recipient located in Albuquerque, New Mexico, offers a "Food Farmacy" to help patients eat healthier at no cost. Patients can visit the "farmacy", pick out the groceries they need, and get advice from staff and volunteers on how to prepare it. The "farmacy" began in 2018 and provided patients with an in-person grocery experience. However, in March 2020, during the COVID-19 pandemic, Presbyterian converted the Food Farmacy to a drive-thru model to ensure patients continued access to its benefits. Staff and volunteers were able to prepare and distribute large quantities of produce and dry items to patients' cars. In addition, Presbyterian was able to provide patients with large boxes of produce and staple items once a week for six weeks during the pandemic. Between March 2020 and July 2021, the Food Farmacy participated in 12,507 visits. The Farmacy continues to utilize its drive-thru model to ensure the safety of its patients, staff, and volunteers.

and non-governmental and community organizations to advance the nation's chronic disease prevention and promotion efforts through cooperative agreements known as SPAN (State Physical Activity and Nutrition Program), HOP (High Obesity Program), and REACH (Racial and Ethnic Approaches to Community Health).[68] These programs provide funding to recipients engaged in evidence-based strategies designed to increase healthy eating and active living and prevent adult and childhood obesity.[68] SPAN funds state-level recipients to implement and promote policy, systems and environmental change strategies at the state and local level that support healthy nutrition, safe and accessible physical activity, and breastfeeding. HOP funds land grant universities to work with community extension services in counties with high rates of obesity. Efforts focus on increasing access to healthier foods and safe places for physical activity, including activities that will reduce or eliminate health disparities related to nutrition, physical activity, and obesity. The REACH program, which funds state and local health departments, tribes, universities, and community-based organizations, aims to improve health, prevent chronic diseases, and reduce health disparities among racial and ethnic populations with the highest risk or burden of disease. Examples of SPAN, HOP, and REACH grantee FIM strategies include produce prescription program partnerships with healthcare systems, produce incentive programs, as well as the expansion of the use of electronic benefits transfer (EBT) devices to enhance accessibility of SNAP and other state and community benefits. Although the CDC does not fund incentives for food directly, recipient funds support program staff, recruitment, implementation, technical assistance, evaluation, and connections between healthcare, community, and state and local health departments engaged in food and nutrition security work.

Community Benefits

To maintain their tax-exempt status, non-profit hospitals are required to provide benefits to the community through charitable care or other services and activities. Community benefits cover a wide range of activities and are often informed by the CHNA process, which must be completed every three years to assess the health needs of the community. In communities where diet-related disease and food insecurity have been identified as top concerns, healthcare systems may offer community benefit support for healthy food access initiatives to address these needs. Hospitals and healthcare systems may provide funding and implement programs themselves and/or partner with communities to implement programs that support food and nutrition security. Healthy Food Playbook has developed a series of opportunity briefs that describe the ways in which hospitals have partnered with communities to implement and support nutrition security programming.

USDA Gus Schumacher Nutrition Incentive Program (GusNIP)

The GusNIP program, formerly known as the Food Insecurity Nutrition Incentive (FINI) program, was authorized under the 2018 Farm Bill to fund nutrition incentive programs, which include SNAP incentives (which are not FIM programs because they are not associated with the healthcare system) and produce prescriptions (a type of FIM program). Produce prescriptions aim to increase fruit and vegetable consumption, reduce food insecurity, and improve nutrition and health status. Between 2019-2022, funding for produce prescription programs typically ranged from $80,000 to around $600,000 for pilot projects, mid-sized projects, and large-scale initiatives. This funding stream brings together community-based organizations, food retailers, and healthcare partners. In 2022, the USDA National Institute of Food and Agriculture announced that nearly $40 million in additional funding would be made available to support GusNIP Produce Prescription Programs as part of the American Rescue Plan Act.

SNAP-Ed

SNAP-Ed is a federally funded grant program that supports healthy eating and active living, in partnership with state and local organizations. SNAP-Ed provides funding for nutrition education and obesity prevention programs. In California, for example, SNAP-Ed funding is used to implement food insecurity screening in clinics, develop referral pathways to nutrition assistance programs, conduct pop up produce distributions, and provide nutrition education resources to low-income households.

Healthcare Quality Improvement and Private Sector Funds

In contrast to grant-based or philanthropic funding, healthcare systems may have funding set aside to perform QI projects around social determinants of health, food and nutrition security, and health equity. In these cases, system administrators can elect to design, implement, and evaluate programs to improve nutrition and health in patients. Examples include Kaiser Permanente's Food for Life program, which is investing in a variety of programs including referrals to federal nutrition assistance programs, produce prescriptions, and MTMs.[69] Levels of funding support may range from in-kind collaboration and contributions (e.g., screening patients, collating and sharing EHR data for a community or academic partner to assess clinical outcomes) to full support for the program (including costs of food, evaluation, etc.). Healthcare systems and community partners should explore such potential sources of internal funding support when designing programs.

Many new private sector companies are entering the FIM space, recognizing the value they may provide to the healthcare system by treating patients with diet-related conditions with healthy food. These private sector companies, often funded by venture capital, may have incentives to perform timely interventions with careful evaluations to show efficacy. Such companies may be able to work with healthcare, community, and academic partners to provide in-kind collaboration and support (e.g., providing meals or food for patient interventions). Given the potential for financial conflict-of-interest, such collaborations must include safeguards to ensure transparency of the partnership and independence of the evaluation and its reporting.

Medicaid and Medicare Benefits

One way to make FIM programming more sustainable would be to include access to such programs as a covered benefit in a health insurance plan. This strategy integrates services directly into the insurance coverage, while also formalizing coordination between health plans, healthcare providers, and program implementers. Coverage as a benefit also helps to manage healthcare system concerns over fraud and abuse laws under the Anti-Kickback Statute (AKS) and Civil

Monetary Penalties Law (CMPL).[d]

State Medicaid programs and Medicaid managed care organizations hold the legal authority to provide food- and nutrition-related benefits to enrollees. For example, several state Medicaid programs provide meals as part of their home- and community-based services to individuals who would otherwise require an institutional level of care under Section 1915 Waivers.[70] Massachusetts, North Carolina, and Oregon have implemented and New York State is in the process of implementing Section 1115 Demonstration Waivers to pay for medically tailored meals, healthy food vouchers, and other nutrition-relevant services.[35,71,72]

In addition to state options, Medicaid managed care organizations have the flexibility to provide benefits in addition to those required under a state plan, without additional waivers, through a series of regulatory provisions allowing for "in lieu of" services, value-added services, and quality improvement services. Centers for Medicare and Medicaid Services (CMS) issued a State Health Official letter in January 2021 to describe these opportunities.[73] The state of California has a new 1915(b) waiver to provide a range of FIM as community supports (also previously referred to as "in lieu of services").

Opportunities to cover food and nutrition as a benefit are also growing in Medicare, with recent changes expanding insurers' ability to offer such supports as a managed care supplemental benefit. Guidance on Special Supplemental Benefits for the Chronically Ill (SSBCI), a category launched in 2020, permits Medicare Advantage Organizations to offer meals, produce, and other food supports to enrollees with a chronic illness. Benefits must have a "reasonable expectation of improving and maintaining the health or overall function of the chronically ill enrollee." Historically, Medicare Advantage plans had only been able to cover meals as supplemental benefits under limited circumstances and only for a short duration. A 2021 report indicates that meals are the most popular benefit provided under SSBCI to date, offered by more than 356 plans enrolling 1.5 million beneficiaries.[74] This number grew to 403 plans covering over 1.9 million beneficiaries in 2022.[75] Produce prescription programs and other food supports follow close behind, offered by 336 plans enrolling 1.9 million beneficiaries.

Medicare Advantage Organizations also have the option to participate in the CMS Innovation Center's Value-Based Insurance Design pilot. As under SSBCI, food-related supports are benefits entitled under the Value-Based Insurance Design model, which tests the impact of supplemental benefits in targeted populations. This model creates additional flexibility compared to SSBCI because it enables beneficiaries to receive additional benefits based on socioeconomic status as well as chronic conditions.[76]

d The Anti-Kickback Statute is a criminal law that prohibits the knowing and willful payment of "remuneration" to induce or reward patient referrals or the generation of business involving any item or service payable by the Federal healthcare programs (e.g., drugs, supplies, or healthcare services for Medicare or Medicaid patients). The Civil Monetary Penalties Law (CMPL) authorizes the Officer of Inspector General (OIG) to seek civil money penalties, assessments, and program exclusion for various forms of fraud and abuse involving the Medicare and Medicaid programs.

Healthcare Provider Pathways

Healthcare providers can look to other options to offer FIM programming, including: (1) flexibilities for CMS-sponsored models; (2) legal flexibility under a new patient engagement and support safe harbor rule; and (3) additional flexibilities under the CMPL. The highly technical context and rules for taking advantage of these options are provided in the Appendix.

The guide, Food Banks as Partners in Health Promotion: Navigating Patient Inducement Laws, was developed by The Center for Health Law and Policy Innovation of Harvard Law School and Feeding America to help food banks, pantries, and other community-based organizations navigate some of the legal complexities of working with healthcare partners. The guide provides an overview of the legal landscape faced by healthcare partners, its potential impact on programming, and strategies for creating a successful partnership.

Sustainability through Policy

Lack of long-term, sustainable funding has been identified as a significant barrier to the widescale adoption and expansion of food and nutrition security programs.[77] Efforts to create sustainable funding mechanisms to support these programs should focus on policy solutions both within and outside the healthcare system. Integrating FIM programs into healthcare will require policy solutions that broaden payment coverage by public and private health insurers. Local government funding streams, such as revenue from sugar sweetened beverages taxes (as is currently being done in Seattle and San Francisco) may be another source for sustainable support for public health programming beyond traditional reimbursement mechanisms. Policymakers should consider the breadth of the evidence around FIM programs as they are making funding decisions for programs such as GusNIP during the next Farm Bill reauthorization, poised for 2023. Finally, policy efforts should focus on strengthening federal nutrition assistance programs by expanding access, removing administrative barriers, supporting equitable approaches for the territories, and increasing the benefit amount. A 2021 report by the Center for Health Law and Policy Innovation titled Mainstreaming Produce Prescriptions: A Policy Strategy Report provides a detailed list of recommendations for sustaining these programs.[77]

Conclusions

Background
Food is Medicine Programs
Community-Level Food & Nutrition Security Assessment
Building Support for Food is Medicine Programs
Evaluation
Funding Mechanisms
Conclusions
References & Appendix

Food and nutrition security programs are important tools for health promotion and addressing diet-related chronic conditions and health disparities. Collaboration between healthcare systems, state and local health departments, community-based organizations, and other public health allies are critical for the success of these programs. This guide highlights opportunities for implementers across multiple sectors as they seek to develop solutions to tackle food and nutrition insecurity in their communities.

Future policy solutions should focus on identifying long-term, sustainable funding streams that will allow implementers to strengthen, scale, and maintain these programs.

References

Background
Food is Medicine Programs
Community-Level Food & Nutrition Security Assessment
Building Support for Food is Medicine Programs
Evaluation
Funding Mechanisms
Conclusions
References & Appendix

1. USDA Food and Nutrition Service. Definitions of Food Security. Definitions of Food Security. Published September 8, 2021. Accessed May 31, 2020. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx
2. USDA. Food and Nutrition Security. Accessed August 15, 2022. https://www.usda.gov/nutrition-security
3. CDC. Equitably Addressing Social Determinants of Health and Chronic Diseases. Advancing Health Equity in Chronic Disease Prevention and Management. Published March 29, 2022. Accessed May 25, 2022. https://www.cdc.gov/chronicdisease/programs-impact/sdoh.htm
4. Mozaffarian D, Fleischhacker S, Andrés JR. Prioritizing Nutrition Security in the US. JAMA. Published online April 1, 2021. doi:10.1001/jama.2021.1915
5. O 'Hearn Meghan, Lauren BN, Wong JB, Kim DD, Mozaffarian D. Trends and Disparities in Cardiometabolic Health Among U.S. Adults, 1999-2018. Journal of the American College of Cardiology. 2022;80(2):138-151. doi:10.1016/j.jacc.2022.04.046
6. CDC. Childhood Obesity Facts. Published July 27, 2022. Accessed August 15, 2022. https://www.cdc.gov/obesity/data/childhood.html
7. GAO. Chronic Health Conditions: Federal Strategy Needed to Coordinate Diet-Related Efforts. Accessed March 9, 2022. https://www.gao.gov/products/gao-21-593
8. Stokes EK. Coronavirus Disease 2019 Case Surveillance — United States, January 22–May 30, 2020. MMWR Morb Mortal Wkly Rep. 2020;69. doi:10.15585/mmwr.mm6924e2
9. Coleman-Jensen A, Rabbitt MP, Gregory CA, Singh A. Household Food Security in the United States in 2021. Accessed November 22, 2022. http://www.ers.usda.gov/publications/pub-details/?pubid=104655
10. Rehm CD, Peñalvo JL, Afshin A, Mozaffarian D. Dietary Intake Among US Adults, 1999-2012. JAMA. 2016;315(23):2542-2553. doi:10.1001/jama.2016.7491
11. Micha R, Peñalvo JL, Cudhea F, Imamura F, Rehm CD, Mozaffarian D. Association Between Dietary Factors and Mortality From Heart Disease, Stroke, and Type 2 Diabetes in the United States. JAMA. 2017;317(9):912-924. doi:10.1001/jama.2017.0947
12. Caspi CE, Davey C, Barsness CB, et al. Needs and Preferences Among Food Pantry Clients. Prev Chronic Dis. 2021;18:E29. doi:10.5888/pcd18.200531
13. Campbell E, Hudson H, Webb K, Crawford PB. Food Preferences of Users of the Emergency Food System. null. 2011;6(2):179-187. doi:10.1080/19320248.2011.576589
14. CMS. CMS Office of the Actuary Releases 2017 National Health Expenditures. Accessed March 9, 2022. https://www.cms.gov/newsroom
15. American Diabetes Association. Economic Costs of Diabetes in the U.S. in 2017. Diabetes Care. 2018;41(5):917-928. doi:10.2337/dci18-0007

16. Jardim TV, Mozaffarian D, Abrahams-Gessel S, et al. Cardiometabolic disease costs associated with suboptimal diet in the United States: A cost analysis based on a microsimulation model. PLOS Medicine. 2019;16(12):e1002981. doi:10.1371/journal.pmed.1002981
17. Artiga S, Hinton EJ. Beyond Health Care: The Role of Social Determinants in Promoting Health and Health Equity. KFF. Published May 10, 2018. Accessed October 13, 2021. https://www.kff.org/racial-equity-and-health-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/
18. Barnidge E, Stenmark S, Seligman H. Clinic-to-Community Models to Address Food Insecurity. JAMA Pediatr. 2017;171(6):507-508. doi:10.1001/jamapediatrics.2017.0067
19. National Academies of Sciences, Engineering, and Medicine. Communities in Action: Pathways to Health Equity. The National Academies Press; 2017. Accessed April 27, 2023. https://doi.org/10.17226/24624
20. CDC. Health and Economic Costs of Chronic Diseases. Accessed August 30, 2022. https://www.cdc.gov/chronicdisease/about/costs/index.htm
21. Seligman HK, Berkowitz SA. Aligning Programs and Policies to Support Food Security and Public Health Goals in the United States. Annu Rev Public Health. 2019;40(1):319-337. doi:10.1146/annurev-publhealth-040218-044132
22. CHLPI. Food is Medicine. Accessed May 24, 2022. https://chlpi.org/project/food-is-medicine/
23. Gottlieb LM, Wing H, Adler NE. A Systematic Review of Interventions on Patients' Social and Economic Needs. Am J Prev Med. 2017;53(5):719-729. doi:10.1016/j.amepre.2017.05.011
24. Steiner JF, Stenmark SH, Sterrett AT, et al. Food Insecurity in Older Adults in an Integrated Health Care System. J Am Geriatr Soc. 2018;66(5):1017-1024. doi:10.1111/jgs.15285
25. Calloway EE, Carpenter LR, Gargano T, Sharp JL, Yaroch AL. Development of new measures to assess household nutrition security, and choice in dietary characteristics. Appetite. 2022;179:106288. doi:10.1016/j.appet.2022.106288
26. Stenmark SH, Steiner JF, Marpadga S, Debor M, Underhill K, Seligman H. Lessons Learned from Implementation of the Food Insecurity Screening and Referral Program at Kaiser Permanente Colorado. Perm J. 2018;22:18-093. doi:10.7812/TPP/18-093
27. Gundersen C, Engelhard EE, Crumbaugh AS, Seligman HK. Brief assessment of food insecurity accurately identifies high-risk US adults. Public Health Nutrition. 2017;20(8):1367-1371. doi:10.1017/S1368980017000180
28. Food is Medicine Coalition. Food is Medicine Coalition. Accessed December 5, 2022. http://www.fimcoalition.org
29. Berkowitz SA, Terranova J, Randall L, Cranston K, Waters DB, Hsu J. Association Between Receipt of a Medically Tailored Meal Program and Health Care Use. JAMA Internal Medicine. 2019;179(6):786-793. doi:10.1001/jamainternmed.2019.0198

30. Berkowitz SA, Terranova J, Hill C, et al. Meal Delivery Programs Reduce The Use Of Costly Health Care In Dually Eligible Medicare And Medicaid Beneficiaries. Health Aff (Millwood). 2018;37(4):535-542. doi:10.1377/hlthaff.2017.0999
31. Palar K, Napoles T, Hufstedler LL, et al. Comprehensive and Medically Appropriate Food Support Is Associated with Improved HIV and Diabetes Health. J Urban Health. 2017;94(1):87-99. doi:10.1007/s11524-016-0129-7
32. Hager K, Cudhea FP, Wong JB, et al. Association of National Expansion of Insurance Coverage of Medically Tailored Meals With Estimated Hospitalizations and Health Care Expenditures in the US. JAMA Network Open. 2022;5(10):e2236898. doi:10.1001/jamanetworkopen.2022.36898
33. Academy of Nutrition and Dietetics. Dietitians and Ryan White HIV/AIDS Program. Accessed March 9, 2022. https://www.eatrightpro.org/advocacy/legislation/all-legislation/ryan-white-hiv-aids-program
34. FIMC. FIMC MTM State-based Innovation. Food is Medicine Coalition. Accessed December 2, 2022. http://www.fimcoalition.org/healthcare-innovation
35. New York State Department of Health. New York State Medicaid Managed Care Alternative Services and Settings - In Lieu of Services (ILS). Accessed December 2, 2022. https://www.health.ny.gov/health_care/managed_care/app_in_lieu_of_svs_mmc.htm
36. Food As Medicine Collaborative. Implementing CalAIM Medically Supportive Food & Nutrition Services. Food As Medicine Collaborative. Accessed December 5, 2022. https://www.foodasmedicinecollaborative.org/calaim
37. Little M, Rosa E, Heasley C, Asif A, Dodd W, Richter A. Promoting Healthy Food Access and Nutrition in Primary Care: A Systematic Scoping Review of Food Prescription Programs. Am J Health Promot. 2022;36(3):518-536. doi:10.1177/08901171211056584
38. Donohue JA, Severson T, Martin LP. The food pharmacy: Theory, implementation, and opportunities. American Journal of Preventive Cardiology. 2021;5:100145. doi:10.1016/j.ajpc.2020.100145
39. Oronce CIA, Miake-Lye IM, Begashaw MM, Booth M, Shrank WH, Shekelle PG. Interventions to Address Food Insecurity Among Adults in Canada and the US: A Systematic Review and Meta-analysis. JAMA Health Forum. 2021;2(8):e212001. doi:10.1001/jamahealthforum.2021.2001
40. Feinberg AT, Hess A, Passaretti M, Coolbaugh S, Lee TH. Prescribing Food as a Specialty Drug. NEJM Catalyst. Published online April 10, 2018. Accessed October 18, 2021. https://catalyst.nejm.org/doi/full/10.1056/CAT.18.0212
41. Lee Y, Mozaffarian D, Sy S, et al. Cost-effectiveness of financial incentives for improving diet and health through Medicare and Medicaid: A microsimulation study. PLoS Med. 2019;16(3):e1002761. doi:10.1371/journal.pmed.1002761
42. Community Alliance with Family Farmers. CSA. Community Alliance with Family Farmers. Accessed June 15, 2022. https://caff.org/csa/
43. Nutrition Incentive Hub. GusNIP Grantees. Accessed August 23, 2022. nutritionincentivehub.org/grantee-projects

44. National WIC Association. WIC's Cash Value Benefit (CVB) Increase: What Does It Mean For Me? National WIC Association. Accessed May 23, 2022. https://www.nwica.org/blog/wics-cash-value-benefit-cvb-increase-what-does-it-mean-for-me

45. Hamad R, Collin DF, Baer RJ, Jelliffe-Pawlowski LL. Association of Revised WIC Food Package With Perinatal and Birth Outcomes: A Quasi-Experimental Study. JAMA Pediatr. Published online July 1, 2019. doi:10.1001/jamapediatrics.2019.1706

46. Hamad R, Batra A, Karasek D, et al. The Impact of the Revised WIC Food Package on Maternal Nutrition During Pregnancy and Postpartum. Am J Epidemiol. 2019;188(8):1493-1502. doi:10.1093/aje/kwz098

47. USDA NIFA. Gus Schumacher Nutrition Incentive Program (GusNIP). National Institute of Food and Agriculture. Accessed August 23, 2022. http://www.nifa.usda.gov/grants/programs/hunger-food-security-programs/gus-schumacher-nutrition-incentive-program

48. Haslam A, Gill J, Taniguchi T, Love C, Jernigan VB. The effect of food prescription programs on chronic disease management in primarily low-income populations: A systematic review and meta-analysis. Nutr Health. Published online February 2, 2022:2601060211070718. doi:10.1177/02601060211070718

49. Conrad Z, Rehm CD, Wilde P, Mozaffarian D. Cardiometabolic Mortality by Supplemental Nutrition Assistance Program Participation and Eligibility in the United States. Am J Public Health. 2017;107(3):466-474. doi:10.2105/AJPH.2016.303608

50. Berkowitz SA, Palakshappa D, Rigdon J, Seligman HK, Basu S. Supplemental Nutrition Assistance Program Participation and Health Care Use in Older Adults : A Cohort Study. Ann Intern Med. 2021;174(12):1674-1682. doi:10.7326/M21-1588

51. Berkowitz SA, Seligman HK, Rigdon J, Meigs JB, Basu S. Supplemental Nutrition Assistance Program (SNAP) Participation and Health Care Expenditures Among Low-Income Adults. JAMA Internal Medicine. 2017;177(11):1642-1649. doi:10.1001/jamainternmed.2017.4841

52. Ettinger de Cuba S, Chilton M, Bovell-Ammon A, et al. Loss Of SNAP Is Associated With Food Insecurity And Poor Health In Working Families With Young Children. Health Affairs. 2019;38(5):765-773. doi:10.1377/hlthaff.2018.05265

53. Carlson S, Keith-Jennings B. SNAP Is Linked with Improved Nutritional Outcomes and Lower Health Care Costs. Center on Budget and Policy Priorities; 2018. https://www.cbpp.org/research/food-assistance/snap-is-linked-with-improved-nutritional-outcomes-and-lower-health-care

54. Marpadga S, Fernandez A, Leung J, Tang A, Seligman H, Murphy EJ. Challenges and Successes with Food Resource Referrals for Food-Insecure Patients with Diabetes. Perm J. 2019;23:18-097. doi:10.7812/TPP/18-097

55. Cavaliere B, Martin K, Smith M, Hake M. Key Drivers to Improve Food Security and Health Outcomes: An Evidence Review of Food Bank – Health Care Partnerships and Related Interventions.; 2021. Accessed December 5, 2022. https://hungerandhealth.feedingamerica.org/resource/food-bank-health-care-partnerships-evidence-review/

56. The Greater Boston Food Bank. The Greater Boston Food Bank. Accessed August 23, 2022. https://www.gbfb.org/

57. Centers for Disease Control and Prevention. Community-Clinical Linkages for the Prevention and Control of Chronic Diseases: A Practioner's Guide. US Department of Health and Human Services; 2016. https://www.cdc.gov/dhdsp/pubs/docs/ccl-practitioners-guide.pdf

58. AAFP. The EveryONE Project Toolkit. Accessed March 9, 2022. https://www.aafp.org/family-physician/patient-care/the-everyone-project/toolkit.html

59. CHLPI, Feeding America. Food Banks as Partners in Health Promotion: Navigating Patient Inducement Laws.; 2021. Accessed December 5, 2022. https://hungerandhealth.feedingamerica.org/resource/navigating-patient-inducement-laws/

60. Barnett K, Calhoun H. Making Food Systems Part of Your Community Health Needs Assessment: Practical Guidance from the Tackling Hunger Project. Public Health Institute; 2016:1-37

61. Schwartz M, Levi R, Lott M, Arm K, Seligman H. Healthy Eating Research Nutrition Guidelines for the Charitable Food System. Healthy Eating Research; 2020. Accessed November 25, 2020. https://healthyeatingresearch.org:443/research/healthy-eating-research-nutrition-guidelines-for-the-charitable-food-system/

62. Fleischhacker SE, Woteki CE, Coates PM, et al. Strengthening national nutrition research: rationale and options for a new coordinated federal research effort and authority. Am J Clin Nutr. 2020;112(3):721-769. doi:10.1093/ajcn/nqaa179

63. The Aspen Institute. Food is Medicine Research Action Plan. Access December 5, 2022. https://www.aspeninstitute.org/programs/food-and-society-program/food-is-medicine-project/

64. Budd Nugent N, Byker Shanks C, Seligman HK, et al. Accelerating Evaluation of Financial Incentives for Fruits and Vegetables: A Case for Shared Measures. Int J Environ Res Public Health. 2021;18(22):12140. doi:10.3390/ijerph182212140

65. Browning M. Developing New Measures to Assess Factors Associated with Food Insecurity in the U.S. National Institute of Food and Agriculture. Published August 9, 2022. Accessed August 25, 2022. http://www.nifa.usda.gov/about-nifa/impacts/developing-new-measures-assess-factors-associated-food-insecurity-us

66. Baily MA, Bottrell M, Lynn J, Jennings B. THE ETHICS OF USING QI METHODS TO IMPROVE HEALTH CARE QUALITY AND SAFETY. HASTINGS CENTER REPORT. Published online 2006:40.

67. Feeding America. Food Is Medicine Project (2018-20) – Final Report, Results, and Key Learnings. Accessed October 13, 2021. https://hungerandhealth.feedingamerica.org/resource/food-is-medicine-final-report-2021/

68. CDC. CDC-funded state and local programs. Centers for Disease Control and Prevention. Published August 19, 2021. Accessed February 24, 2022. https://www.cdc.gov/nccdphp/dnpao/state-local-programs/index.html

69. Kaiser Permanente Media Relations. Boosting Food Security to Improve Nation's Total Health. Kaiser Permanente Look insideKP Northern California.

Published October 28, 2019. Accessed August 24, 2022. https://lookinside.kaiserpermanente.org/boosting-food-security-to-improve-nations-total-health/

70. US DHHS. Application for a Â§1915(c) Home and Community-Based Waiver Instructions, Technical Guide and Review Criteria. Accessed May 23, 2022. https://www.hhs.gov/guidance/document/application-ass1915c-home-and-community-based-waiver-instructions-technical-guide-and
71. U.S. DHHS. Implementing Supplemental Benefits for Chronically Ill Enrollees. US Dept. of Health & Human Services Guidance Portal. Published August 31, 2020. Accessed May 23, 2022. https://www.hhs.gov/guidance/document/implementing-supplemental-benefits-chronically-ill-enrollees
72. Oregon Health Authority. 2022-2027 Medicaid 1115 Demonstration Waiver. Accessed January 24, 2023. https://www.oregon.gov/oha/hsd/medicaid-policy/pages/waiver-renewal.aspx
73. Centers for Medicare & Medicaid Services. Centers for Medicare & Medicaid Services. Opportunities in Medicaid and CHIP to address social determinants of health (SDOH). Published online January 7, 2021. https://www.medicaid.gov/federal-policy-guidance/downloads/sho21001.pdf
74. Duddy-Tenbrunsel R, Donthi S, Young J, Kornfield T. MA Enrollment in Plans with Extra Benefits for Chronically Ill Tripled in 2021. Avalere Health. Published February 5, 2021. Accessed May 23, 2022. https://avalere.com/insights/ma-enrollment-in-plans-with-extra-benefits-for-chronically-ill-tripled-in-2021
75. HealthPayerIntelligence. Medicare Advantage Plans Boost Supplemental Benefits Offerings. HealthPayerIntelligence. Published March 2, 2022. Accessed January 4, 2023. https://healthpayerintelligence.com/news/medicare-advantage-plans-boost-supplemental-benefits-offerings
76. Centers for Medicare & Medicaid Services, Center for Medicare & Medicaid Innovation. Value-Based Insurance Design Model request for applications for CY 2021. Published online March 13, 2020. https://innovation.cms.gov/files/x/vbid-rfa2021.pdf
77. Center for Health Law and Policy Innovation of Harvard Law School. Mainstreaming Produce Prescriptions: A Policy Strategy Report.; 2021.

Appendix

Background
Food is Medicine Programs
Community-Level Food & Nutrition Security Assessment
Building Support for Food is Medicine Programs
Evaluation
Funding Mechanisms
Conclusions
References & Appendix

Evaluation

Measuring Food and Nutrition Security

Food security is an important measure of programmatic impact and may also be used to determine program need and participant eligibility. Brief screening tools such as the 2-question Hunger Vital Sign (HVS) are effective for screening for food insecurity in the clinical setting to determine who may benefit from an intervention. For evaluation and research, more detailed tools such as the USDA's 6-item Food Security Survey Module (FSSM) provide reliable, validated assessments of food insecurity among households, with reduced respondent burden compared to the full 18-item version. Evaluators should consider and adapt the "look-back" period from 12 months to 30 days, depending on the duration of their intervention, in order to better capture its impact (i.e., start each question with "In the last 30 days..." instead of "In the last 12 months..."; see USDA guidance).[1] Other measures of food insecurity may also be suited for the program intervention depending on the participant population and evaluation needs.[1]

While measures of food security have been studied extensively, measures of nutrition security are still in development stages.[2] In the absence of a validated metric, use of a brief nutrition screener based on existing work is encouraged (see box of Sample Nutrition Security Screening Questions). Ideally, both food security and nutrition security should be measured, given

Sample Nutrition Security Screening Questions

Developed and piloted by investigators at Tufts University, Kaiser Permanente, and the Los Angeles County Department of Public Health. More information on this screening tool is available at https://tuftsfoodismedicine.org/project/nss/.

The next questions are about eating healthy foods – foods that support your health and well-being. These foods include, for example, fruits, vegetables, whole grains, beans, nuts, yogurt, and fish. These foods can be fresh, frozen, or canned; and don't have to be organic. Less healthy foods can include foods that are highly processed, packaged, and high in salt, starch, sugar, and unhealthy fats.

1. Thinking about the last 12 months, how hard was it for you or your household to regularly get and eat healthy foods that support your well-being?
   b. Very hard
   c. Hard
   d. Somewhat hard
   e. Not very hard
   f. Not hard at all
   g. Don't know/prefer not to answer
2. People have different reasons for eating or not eating healthy foods. Please tell me which, if any, of the following reasons were true for you or your household in the last 12 months. *Answer options include often true, sometimes true, or never true [for electronic survey randomize statements below] [voluntary responses: Don't know, refused]*
   a. Healthy foods are too expensive
   b. There aren't a lot of healthy food choices at the stores where I usually shop
   c. Stores or food pantries with healthy foods are too far away or hard to reach
   d. I don't have a car or transportation to reach stores or food pantries that have healthy foods
   e. I don't have enough time to shop for healthy foods
   f. I don't have enough time to cook healthy foods
   g. My cooking equipment or storage space is not enough to prepare healthy foods
   h. I don't know how to cook healthy foods
   i. I don't know which foods are considered healthy foods
   j. I or my family don't like the taste of healthy foods
   k. Some of the foods from my culture are hard to make healthy
   l. I'm not sure I qualify for food assistance programs like food stamps (also known as SNAP or EBT) or WIC that help me buy healthy foods
   m. I have mobility challenges or physical limitations that make it difficult for me to prepare and eat healthy foods
   n. Other - please specify: _____

their complementary conceptual underpinnings. However, this may not be able to be widely implemented until there is a validated measure for nutrition security available.

Measuring Dietary Quality and Fruit and Vegetable Intake

Given the interplay between food insecurity, nutritional status, and health, dietary quality is a critical metric for measuring program outcomes.[3] The majority of programs collect information on dietary quality using shorter, validated dietary questionnaires. Although these can be relatively simple and quick to administer, these screeners may also create cognitive challenges for participants, and have lower accuracy and precision. While some programs aim to measure overall dietary intake, others have chosen to focus on measuring a few food groups (e.g., fruit and vegetable consumption) via brief fruit and vegetable screeners. Although not a complete measure of dietary quality, the strong association between fruit and vegetable consumption and diet-sensitive chronic diseases makes this measure a reasonable indicator of programmatic impact.

Examples of dietary screeners used by programs include:

Screener Tool	Description
FRESH Foods	Developed by the Gretchen Swanson Center for Nutrition to measure dietary behaviors and intake among food pantry clients. Includes questions on barriers to fruit and vegetable consumption, attitudes about fruit and vegetables from the food pantry and grocery store, and the availability of foods from home and the food pantry. Also includes a single item for self-efficacy for fruit and vegetable intake.
Dietary Screener Questionnaire (DSQ)	Developed by the National Cancer Institute (NCI), this 26-item screener includes questions about the frequency of consumption in the past month of selected foods and drinks. The DSQ captures intakes of fruits and vegetables, dairy/calcium, added sugars, whole grains/fiber, red meat, and processed meat. A fruit and vegetable module can be used alone (without the other modules) to measure fruit and vegetable intake.

The National Cancer Institute houses a library of registered, validated short dietary assessment instruments.

Measuring Health Outcomes and Healthcare Utilization

Based on the known observational links between food insecurity, suboptimal nutrition, poor health outcomes, health disparities, and increased healthcare utilization, many healthcare systems are investing in food and nutrition security interventions with the goal of improving health, advancing health equity, and reducing healthcare costs. As such, evaluations should aim to obtain laboratory, clinical, and utilization data to demonstrate impact.

Clinical measures selected will depend on the patient population, setting, and type, intensity, and

duration of the intervention. For example, interventions targeting a population with diabetes and lasting at least three months may choose to measure HbA1c to assess programmatic impact on long-term glycemic control. Shorter duration interventions, however, may consider alternative metrics given the time needed to meaningfully impact a clinical measure like HbA1c. Given its association with healthcare costs, obesity, measured by BMI, is a common nutrition-related priority metric for healthcare systems. However, obesity is a challenging outcome to alter with shorter-term programs that only target part of the diet; and may not be appropriate for severely ill, frail patients (e.g., in MTM interventions) or for children (where long durations and large sample sizes will be needed to see an impact). Further, while BMI may be useful for determining program eligibility, weight loss may not always be the intended goal of a program, particularly as there are pathways to improve both health and nutrition health outside of weight loss.

Examples of measures relevant to nutrition security interventions that can be extracted from the patient's EHR include:

- Clinical laboratory measures (e.g., HbA1c, blood glucose, lipids)
- Blood pressure
- Body Mass Index (BMI)
- Medication adherence from pharmacy or claims data
- Utilization (hospital admissions, emergency department visits, nursing home admissions, total cost-of-care, out-of-pocket spending) from patient visits or claims data

Clinical diagnoses from ICD-10 codes (e.g., diabetes, obesity, hypertension, congestive heart failure) may also be extracted from the EHR, however, these are not outcomes that are likely to change. As a result, clinical diagnoses may be better used for identifying relevant patient populations, rather than evaluating impact.

While EHR data can provide important information for implementers and researchers, it is not always feasible or within a program's scope or budget to collect EHR data. Outside the EHR, validated, self-reported survey measures can be important indicators of health status, including:

- Screening tools for depression and anxiety symptoms
- Health-related quality of life and self-rated health status (e.g., the CDC's Healthy Days Measure)

Funding Mechanisms: Healthcare Provider Pathways

CMS-Sponsored Models

Healthcare entities participating in Center for Medicare and Medicaid Services (CMS) Innovation Center models ("CMS-sponsored models") – a minority of all healthcare organizations – are able to experiment with patient incentives that promote engagement in, and support the objectives of, value-based programs. Because beneficiary engagement incentives frequently involve the provision of items or services to patients, FIM programs may be implemented under this pathway. Regulators recognize that supports targeting nutrition needs may be appropriate beneficiary engagement incentives. Health and Human Services (HHS) has specifically cited, for instance, the provision of vouchers to access meal programs as one example of an allowable incentive by Medicare Shared Savings Program Accountable Care Organizations (ACOs).[4] In addition, according to guidance documents for the Medicare Diabetes Prevention Program Expanded Model, providing food vouchers to a participant living in a food desert is an allowable—and often effective—tool because it supports type 2 diabetes risk reduction.[5,6] Providing meals in patient group meetings for this intervention may also be permitted.

However, there are limiting factors. HHS does not create blanket permission on food and nutrition incentives, but rather flexibilities bounded by conditions: for example, that programs may not give multiple free meals or meal replacement services for a "substantial portion" of a person's participation.[7] Conditions for compliance are also vague, possibly limiting what some healthcare providers are willing to do.

The Patient Engagement and Support Safe Harbor

Because many providers interested in FIM approaches to improve health are not part of a CMS-sponsored model, HHS made efforts to provide expanded opportunities with a new safe harbor rule in 2020.[8] This new rule is for healthcare providers that are part of a "value-based enterprise" (VBE), protecting certain supports provided to patients to improve care quality, health outcomes, and efficiency. This explicitly includes items, goods, and services to address social determinants of health, including hospital-run food pantries, food vouchers, grocery and meal delivery services, and nutrition education.

However, the new safe harbor rule restricts the aggregate value of tools and supports provided to any single patient to $500 per patient per year, adjusted for inflation. This limits the types and quality of services; and further creates a zero-sum game where different health-related social needs (such as food, housing, and medication management) must compete under a limited annual resource cap. The safe harbor ruling also includes many governing technical conditions on how to become a VBE and how to structure and implement relevant patient support programs. Particularly for smaller healthcare providers, this administratively complex approach may deter engagement under the safe harbor rule, requiring reliance on other payment options and models described in this section.

Additional CMPL Flexibilities

A few other narrowly tailored exceptions to the Civil Monetary Penalties Law (CMPL) can assist healthcare providers to provide some form of nutrition security support to patients in different contexts and circumstances. These include, for example, the financial need-based exception; the preventive care exception; and an exception protecting items/services that promote access to care and pose a low risk of harm.[8] Compliance requirements and inadequate guidance may reduce uptake. Yet, these CMPL exceptions can be used to facilitate a number of nutrition security interventions to support improved health outcomes, especially to meet short-term and/or urgent needs.

References

1. USDA ERS. Measurement. Food Security in the US. Accessed August 24, 2022. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/measurement/#measurement

2. Calloway EE, Carpenter LR, Gargano T, Sharp JL, Yaroch AL. Development of new measures to assess household nutrition security, and choice in dietary characteristics. Appetite. 2022;179:106288. doi:10.1016/j.appet.2022.106288

3. USDA ERS. Survey Tools. Food Security in the US. Accessed May 23, 2022. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/survey-tools/

4. Centers for Medicare & Medicaid Services (CMS), HHS. Medicare Program; Medicare Shared Savings Program; Accountable Care Organizations--Pathways to Success and Extreme and Uncontrollable Circumstances Policies for Performance Year 2017. Final rules. Fed Regist. 2018;83(249):67816-68082.

5. Centers for Medicare & Medicaid Services. Medicare Learning Network. Medicare Diabetes Prevention Program: supplier enrollment call [Internet]. Washington: Centers for Medicare & Medicaid Services. Published online June 18, 2020. https://www.cms.gov/Outreach-and-Education/Outreach/NPC/Downloads/2018-06-20-MDPP-Transcript.pdf

6. Centers for Disease Control and Prevention. Medicare Diabetes Prevention Program (MDPP) Expanded Model. https://nationaldppcsc.cdc.gov/s/article/Medicare-Diabetes-Prevention-Program-MDPP-Expanded-Model-Home-Page

7. Centers for Medicare & Medicaid Services (CMS), HHS.. Medicare Program; Revisions to Payment Policies Under the Physician Fee Schedule and Other Revisions to Part B for CY 2018; Medicare Shared Savings Program Requirements; and Medicare Diabetes Prevention Program. Final rule. Fed Regist. 2017;82(219):52976-53371.

8. Office of Inspector General (OIG), Department of Health and Human Services (HHS). Medicare and State Health Care Programs: Fraud and Abuse; Revisions to Safe Harbors Under the Anti-Kickback Statute, and Civil Monetary Penalty Rules Regarding Beneficiary Inducements. Final rule. Fed Regist. 2021;85(232);77684-77895.