Food as medicine for pregnant people: A landscape analysis to inform future work

Final Report

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The Gretchen Swanson Center for Nutrition

Founded in 1973, the Gretchen Swanson Center for Nutrition is a national nonprofit research institute providing expertise in measurement and evaluation to help develop, enhance and expand programs focused on healthy eating and active living, improving food security and healthy food access, promoting local food systems and applying a health equity lens across all initiatives. The Gretchen Swanson Center works nationally and internationally, partnering with other nonprofits, academia, government and private foundations to conduct research, evaluation and scientific strategic planning.

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Executive Summary

The goal of the collaboration between Share Our Strength and the Gretchen Swanson Center for Nutrition is to document the evolving landscape of Food as Medicine (FAM) programs for pregnant people.

Overall Findings

This landscape analysis of FAM programs for pregnant people includes findings from a systematic review and interviews with experts.

Program Reached Multiple Populations

Programs reached diverse populations of pregnant people; however, engaging individuals experiencing health disparities in program design is needed.

Program Effectiveness Measures Varied

FAM programs for pregnant people used varied measures and metrics to gauge effectiveness.

Multiple Factors Led to Program Adoption

External and internal influences led to the adoption of FAM programs for pregnant people.

Program Components Varied Widely

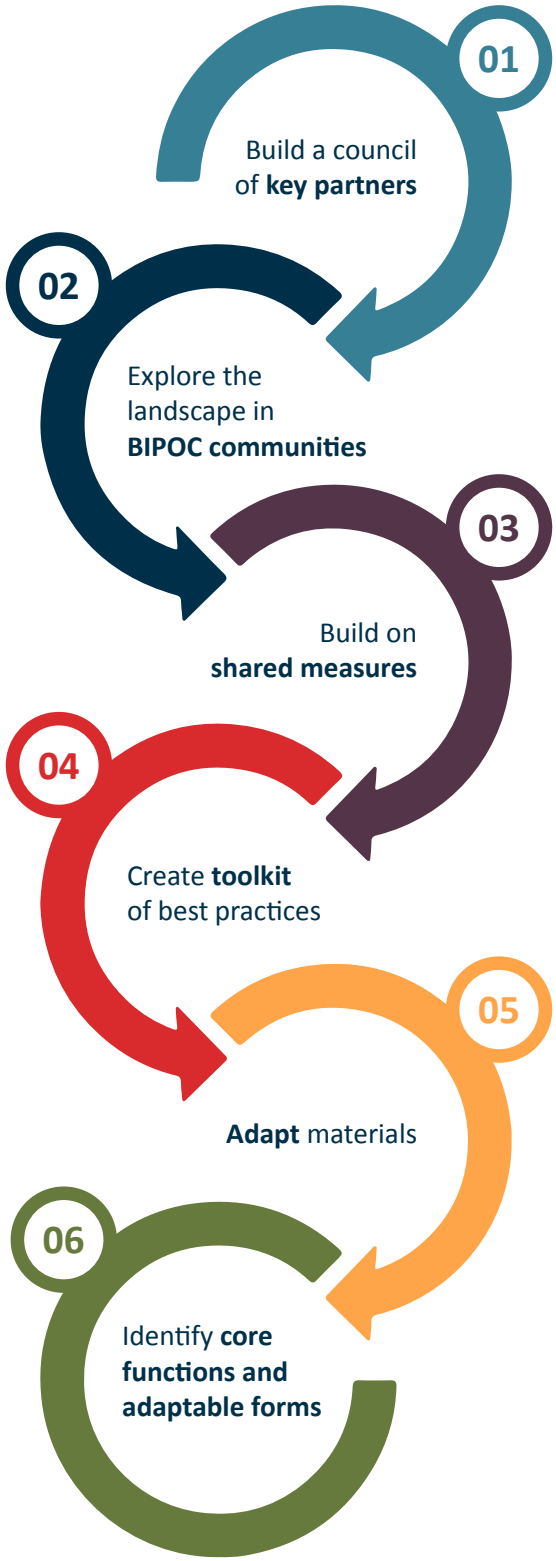
Free or reduced cost food, support services, and community partnerships varied across FAM programs for pregnant people.

Key Factors Could Lead to Sustainable Programs

Building evidence and partnerships may lead to policy changes and sustained funding.

Implications

Future directions of FAM programming for pregnant people is laid out in the following six directions.



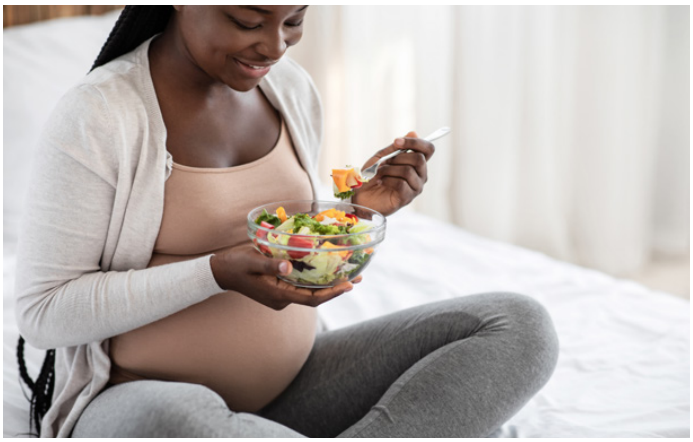
Introduction

Improving social determinants of health (SDOH) – where we live, work, learn, play, and access food – is key to improving the health of marginalized groups and achieving health equity.[1] Nutrition security is the consistent access, availability, and affordability of foods and beverages that promote optimal health and well-being.[2] In 2021, 10.2% of all U.S. households and 12.5% of households with children were food insecure,[3] characterized by inconsistent access to enough food for every person in a household to live an active, healthy life.[4] Rates of food insecurity are even higher among adults enrolled in Medicaid (a federal health insurance program for people with low income),[5] with 20% reporting their household did not have enough to eat in 2020.[6]

One population at risk of adverse health outcomes due to food insecurity is pregnant people. There are several risk factors related to food insecurity during pregnancy that can impact on maternal and fetal health outcomes. These include gestational diabetes, high blood pressure (preeclampsia), being underweight or overweight prior to pregnancy, inadequate weight gain during pregnancy, advanced maternal age or teenage pregnancy, limited support from others, and insufficient food and beverage consumption by the mother.[7] Inadequate food intake during pregnancy has been linked to a range of adverse health outcomes for both the mother and the baby, including low birth weight, premature birth, and developmental delays.[8]

Addressing food insecurity and other SDOH is a priority of Medicaid.[9] Interventions to improve food security of pregnant people are of interest, as Medicaid covered 42% of all births in the U.S. in 2020.[10] Recent Medicaid policy changes have led to an increase in experimental programs to improve SDOH and food insecurity. The Medicaid Home- and Community-Based Services waiver program, specifically Section 1915(c), allows programs to deliver meals to homes for eligible individuals,[11] while Section 1115 authorizes experimental, pilot, or demonstration projects which promote the objectives of Medicaid and vary from state to state.[12]

With these policy changes, **food as medicine** interventions have emerged as a solution to improve food security while preventing, managing, and treating illness.[13] These interventions include 1) **medically tailored meals** meeting individual nutritional requirements based on specific medical conditions,



2) **medically tailored groceries** offering healthy food options tailored to individual dietary requirements, and 3) **produce prescriptions** providing patients with fresh fruits and vegetables through prescriptions from healthcare providers.[13]

Implementation of food as medicine interventions has increased over the past decade, as new programs emerged across the US during the last decade.[14–17] Food as medicine intervention components and delivery vary by organization,[16,18,19] and providers continue to test best practices while eliminating challenges.[20] Researchers continue to evaluate the effectiveness of these interventions on healthcare utilization and outcomes and individual dietary quality.[21–24] However, food as medicine initiatives prioritizing pregnant people have largely gone unstudied.

Thus, the purpose of the study reported here was to provide Share Our Strength's *No Kid Hungry* Campaign with a landscape analysis of food as medicine interventions prioritizing pregnant people. The vision of No Kid Hungry (NKH) is to end childhood hunger through a multi-pronged approach including grants, advocacy, awareness, research, and policy. Due to the recent growth in the food as medicine movement, No Kid Hungry is interested in exploring pregnancy initiatives that address nutrition security and improve birth outcomes. The Gretchen Swanson Center for Nutrition (GSCN) has years of experience in the food as medicine movement through serving as the Nutrition Incentive Program Technical Assistance, Evaluation, and Information Center funded by the USDA NIFA's Gus Schumacher Nutrition Incentive Program (GusNIP), as well as other funded projects. GSCN has past and present working relationships with key food as medicine interest organizations and experience conducting research and strategic evaluation work within public health nutrition.

Specifically, GSCN evaluated the landscape of food as medicine interventions for pregnant people to:

- Understand how food as medicine interventions have been tailored specifically for pregnant people
- Identify what research conclusions have been demonstrated from food as medicine interventions with pregnant people
- Identify what research gaps exist from food as medicine interventions with pregnant people
- Determine how widely available and used food as medicine interventions are for pregnant people enrolled in managed care organizations (MCOs) across the country
- Establish a list of key players that could contribute to sustained funding food as medicine interventions for pregnant people
- Identify how food as medicine interventions could be tailored specifically for pregnant people
- Use data to inform NKH's strategy to lay the groundwork for having food as medicine interventions for pregnant people funded by MCOs as part of their business model

Methods

The landscape analysis includes two components: a systematic review and expert interviews. This methodology was selected to first understand the existing evidence base on food as medicine programs for pregnant people through the systematic review, and then expand on and explain these results through the expert interviews.

Systematic Review Methods

Procedure for Conducting Review

The research team conducted a systematic review, a rigorous method of literature review that includes a comprehensive search and quality assessment conducted to synthesize existing research evidence.[25] For this systematic review, the team included both peer-reviewed literature and grey literature sources detailing food as medicine (FAM) programs for pregnant people. Both types of literature were included to capture both traditional sources of evidence (i.e., those published in scientific journals that have undergone a rigorous evaluation process) and practice-based evidence (e.g., program evaluation reports, news articles) not disseminated through academic publication routes. This search method was selected [26,27] due to the novelty of FAM programs for pregnant people, lack of peer-reviewed publications, and rapid innovations happening in the field. The research team followed established PRISMA systematic review reporting standards to detail why the review was done, how it was conducted, and what was found.[28]

First, peer-reviewed literature was located from two search databases, EBSCOhost and Pubmed, in October 2022. Key terms (see Appendix A) were developed by experts in the field of FAM and pregnancy populations with a goal of finding literature containing information on FAM programs for pregnant people taking place in the U.S. Second, grey literature sources were located through a custom internet search using the Google search engine[29–32] in October 2022. To determine the search terms, the research team used a simplified version of the peer-reviewed literature search terms to accommodate the search engine's capabilities. Combinations of search terms were tested, and two separate searches were conducted with the most relevant combinations ("Food as Medicine" and "Prenatal"; "Produce Prescription" and "Prenatal"). The first 100 sources were collected for each search.

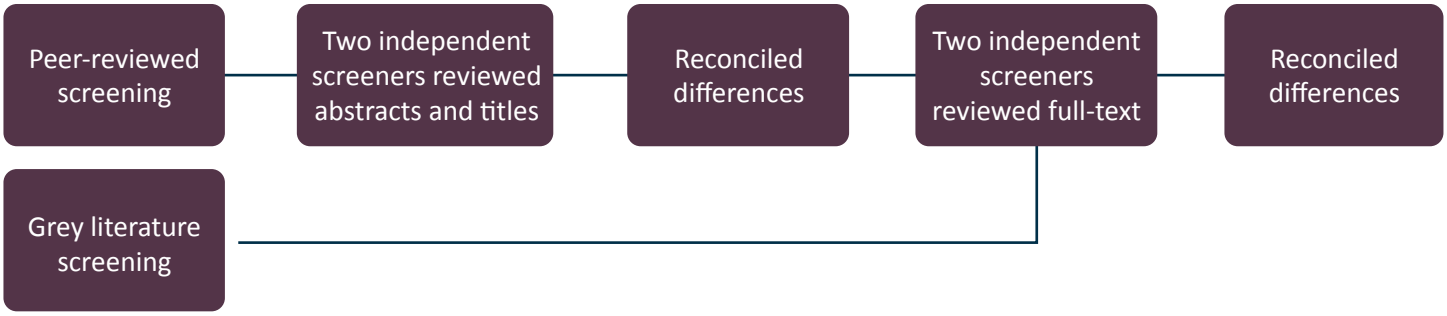
Peer-reviewed and grey literature sources were included if they met the following criteria:

- Intervention (program, practice, process, or policy)
- Aims of improving food access, food security, nutrition security, gestational diabetes mellitus, birth outcomes (e.g., low birth weight, c-section rates, ER visits, etc.), or hypertension outcomes
- Intervention participants/recipients are pregnant people
- Intervention occurred in the U.S.
- Reported in English

Peer-reviewed and grey literature sources were excluded due to the following criteria:

- The full-text was not accessible
- The source did not discuss an intervention
- The source was not focused on improving food access or food as medicine
- The priority population was not pregnant people
- The intervention occurred outside of the U.S.
- The source was not available in English
- The source was a systematic review

Figure 1. Systematic review screening methods



Selection of Sources for Review

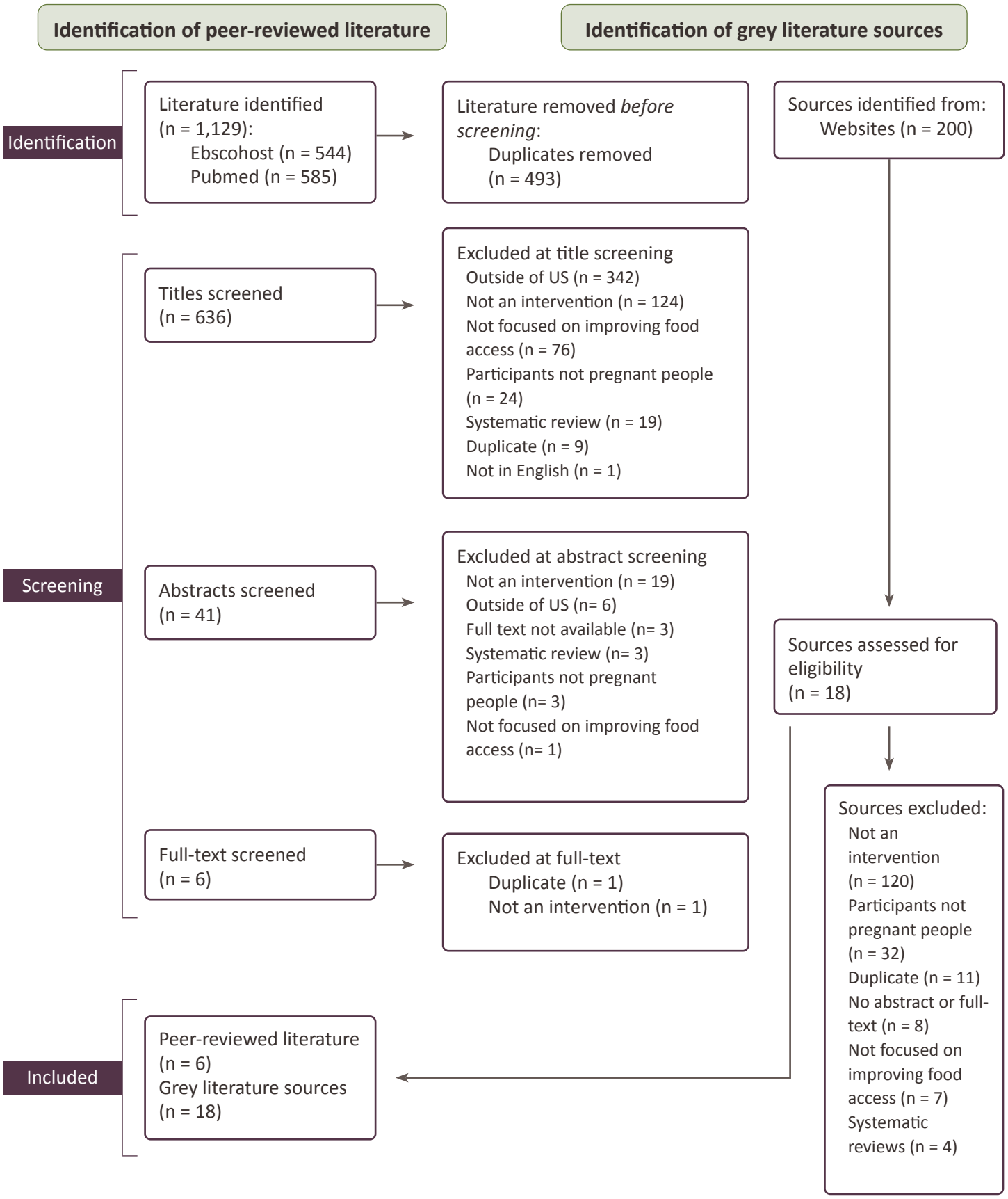
All peer-reviewed and grey literature sources identified through the search were screened to determine if they met all inclusion criteria (see Figure 1). For the peer-reviewed literature, this included screening by title, abstract, and full-text, with articles not meeting criteria being excluded at each step. The grey literature sources were screened by reviewing the full-text of each source, as a descriptive title and abstract are typically not present. Two researchers independently completed each screening step and met to reconcile differences.

The initial search for peer-reviewed literature yielded 1,129 studies. A total of 493 duplicate sources were removed. A total of 636 study titles were screened and 595 titles were excluded because they took place outside of the U.S. (342), were not an intervention (124), were not focused on improving food access (76), did not include pregnant people as the priority population (24), were systematic reviews (19), were duplicate studies (9), or were not published in English (1). Forty-one study abstracts were screened and 37 were excluded because they did not meet inclusion criteria. This left four peer-reviewed literature meeting inclusion criteria. Finally, two additional peer-reviewed literature were identified through the grey literature search. A total of **six peer-reviewed literature**[33–38] are included in this review.

As for the grey literature sources, the full-text of all 200 sources were reviewed and 180 were excluded as they were not an intervention (120), did not include pregnant people (32), were duplicate sources (11), were not available (e.g., behind a paywall, or source link was no longer active) as full-text (8), were not focused on improving food access (7), or were systematic (or other) reviews (4). This left 24 sources meeting inclusion criteria.

The final step was identifying how many unique programs were reported in these sources, as three sources reported multiple unique programs. As well, five sources (e.g., websites and newspaper articles) reported the same program; these were compiled into one program record for analysis. Thus, a total of **18 programs were reported in the grey literature sources.**[39–49] Figure 2 shows the identification, screening, and inclusion of systematic review sources.

Figure 2. Peer-reviewed literature and grey literature sources for systematic review



Data Extraction and Synthesis

A data extraction guide was developed based on the RE-AIM (reach, effectiveness, adoption, implementation, maintenance) framework.[50,51] The RE-AIM framework was chosen as it translates research to practice and balances internal and external validity (i.e., both what happens under tightly controlled test conditions and what happens when programs are delivered in their intended settings). The framework assesses whether interventions reach priority populations, are effective in achieving their key outcomes, are adopted broadly by staff and settings, are implemented as intended and at a reasonable cost, lead to participant outcomes that are maintained over time, and are maintained long-term in organizations. By using the RE-AIM framework, program planners, funders, researchers, and policymakers can understand how interventions are delivered in real-world settings. Table 1 shows the data extraction variables aligned with each RE-AIM dimension.

Definitions of each RE-AIM dimension are:

- Reach: the number, proportion, and representativeness of individuals who participate in the intervention.
- Effectiveness: the impact of an intervention on outcomes.
- Adoption: the number, proportion, and representativeness of settings and people willing to initiate the intervention.
- Implementation: the fidelity to core components and cost (including time and resources) to deliver the intervention.
- Maintenance: the long-term effects of an intervention after six or more months (individual level), and the extent to which the intervention will become institutionalized in a setting (organizational level).

To appraise the quality of the included sources, the research team used the PRECIS-2 (Pragmatic Explanatory Continuum Indicator Summary) tool.[52]

Table 1. Systematic review data extraction variables

Reach	
Rurality	Education
Sample size	Disability
Sex	Veteran
Age	Poverty
Race and ethnicity	Household size
Effectiveness	
Design	
Primary outcome	
Type of data and measures	
Direction of results	
Barriers	
Adoption	
Organization #, proportion, representativeness	
Delivery agent #, proportion, representativeness	
Organization type	
State	
Implementation	
Implementation theory, framework, or model	Frequency
Behavior change theory, framework, or model	Nutrition education
Intervention description	Adaptations
Provisions and components	Fidelity
Setting	Costs
	Funding
	Engagement
	Barriers
Maintenance	
Institutionalization of intervention	
Primary outcomes after 6+ months	

The PRECIS-2 tool was selected as it captures internal and external validity and degree of pragmaticism – that is, the degree to which the intervention was tested in the real world and may be relevant to other real-world settings.[53] This tool assesses whether studies are conducted under ideal (tightly controlled) or usual (real-world) conditions through evaluating nine domains: eligibility criteria, recruitment, setting, organization, flexibility (delivery), flexibility (adherence), follow-up, primary outcome, and primary analysis (see Figure 3). For example, a study that is conducted under usual conditions and has higher external (real-world) validity would recruit participants through usual practices (e.g., reaching the people who attend a clinic without focused recruitment efforts) and include primary outcomes of interest to the participants (e.g., food security, stress levels, physical activity, fruit and vegetable consumption, or social connectedness rather than disease-focused clinical biomarkers).

Figure 3. PRECIS-2 domains used for quality appraisal

Expert Interview Methods

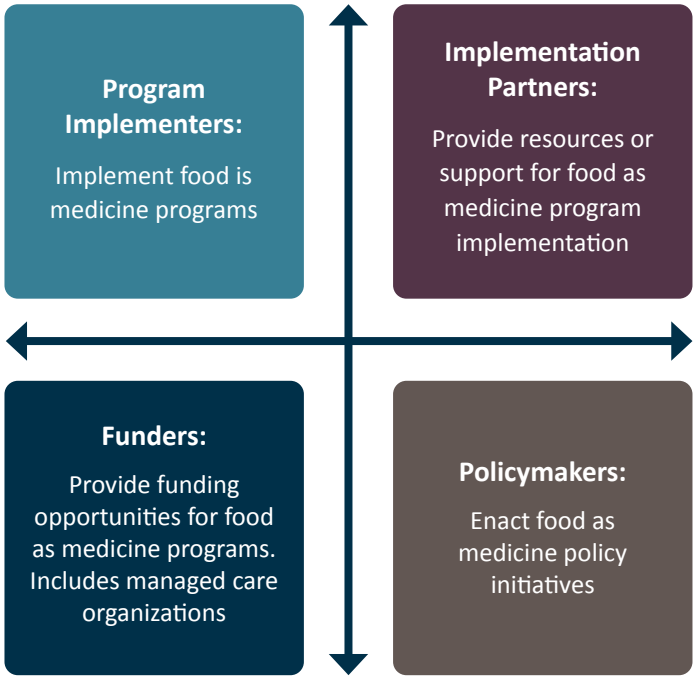
Share Our Strength's No Kid Hungry Campaign team and the GSCN team co-created a comprehensive list of contacts working in FAM for pregnant people. Contacts were categorized into four organization types: program implementers, implementation partners, funders, and policymakers (including managed care organizations). See Figure 4. The implementation partners, funders, and policymakers are portrayed in this report as support systems to the program implementers.

To capture multiple voices in the FAM for pregnant people landscape, we included a diverse sample of interviewees by organization type and region of the U.S.

A semi-structured interview guide was created based on the RE-AIM framework (Appendix B). Briefly, the interview guide was designed to capture:

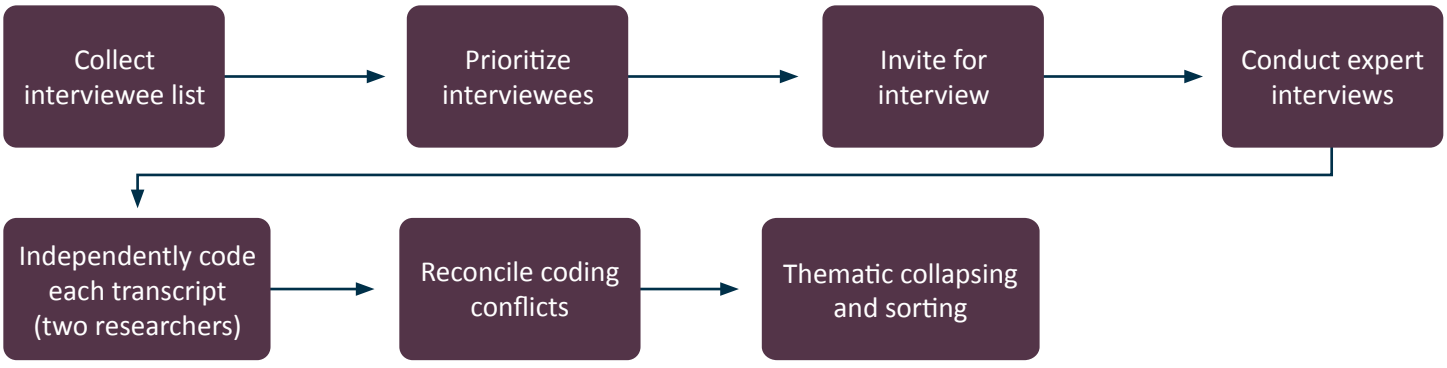
- Reach: the intervention's priority population, recruitment methods, methods centering participants, and barriers.
- Effectiveness: the primary outcomes of the intervention, data collection methods, results, and barriers.
- Adoption: individual, inner setting, outer setting, and innovation factors that led to adoption of programs
- Implementation: the components, education, and cost of the intervention, partner organizations, adaptations to the intervention, facilitators, and barriers.
- Maintenance: plans for long-term implementation and future directions of the intervention.
- Implementation strategies: methods or techniques that support the implementation of programs.

Figure 4. Food as medicine for pregnant people interviewee categories and definitions



Interviews were conducted from November 2022 to January 2023. The majority (28) were phone interviews, with eight conducted via Zoom video calls as requested by the interviewee. Interviews lasted between 45-60 minutes and were audio recorded and transcribed verbatim. Next, a deductive thematic analysis process was used to interpret the data.[54] A coding guide was developed based on the RE-AIM framework and in alignment with the interview guide. Three researchers independently coded one transcript by identifying and categorizing meaning units (words, phrases, or sentences that contain related content that relays one specific thought or idea[55]) into themes associated with each RE-AIM dimension. The research team then met as a group to reconcile coding discrepancies and refine the coding guide. The team then used the refined guide to independently code each transcript through adding comments in Microsoft Word, meeting to reconcile differences, and copying the agreed upon meaning units into Excel templates organized by theme. Finally, thematic collapsing and sorting was conducted to further refine the initial analysis by adding sub-themes and categories as necessary.

Figure 5. Expert interview methods



Results

Systematic Review Results

Reach

All of the peer-reviewed literature reported reach (i.e., at least the number of participants in the program). Race and ethnicity were reported in five of the six peer-reviewed studies (83%). Four studies (67%) reported the education level of the participants. Finally, most studies did not report rurality (five, 83%) or household composition (four, 67%).

Among the grey literature, reach was reported for 15 of the 18 programs (83%). Demographic characteristics of the participants, such as age, race and ethnicity, education, and household composition, were not reported in any of the grey literature sources, with only two sources (11%) reporting rurality. Reach variables are shown in table 2.

Table 2. Reach variables reported by food as medicine for pregnant people programs

Reach Variable	Peer-reviewed (n = 6)	Grey Literature (n = 18)
Number of studies reporting reach	6 (100%)	15 (83%)
Number of individuals impacted by the intervention	Average: 2,697 Range: 32-15,503	Average: 461 Range: 37-3,516
Rurality		
Metropolitan	0 (0%)	1 (6%)
Rural	0 (0%)	1 (6%)
Urban	1 (17%)	0 (0%)
Not reported	5 (83%)	16 (89%)
Age	Average: 27 years old Range: 23-30 years old	Not reported
Race[1]		
Black	5 (83%)	0 (0%)
White	5 (83%)	0 (0%)
Hispanic or Latino	4 (67%)	0 (0%)
Other	3 (50%)	0 (0%)
Asian	1 (17%)	0 (0%)
Not reported	1 (17%)	18 (100%)
Education[1]		
Completed high school	4 (67%)	0 (0%)
Completed some college	4 (67%)	0 (0%)
Not reported	2 (33%)	18 (100%)
Household composition		
Children in household	2 (33%)	0 (0%)
Not reported	4 (67%)	18 (100%)

[1] Note: percentages do not add up to 100, as multiple categories could be reported

Effectiveness

All of the peer-reviewed literature reported effectiveness (i.e., at least some information on the impact of the intervention on its primary outcomes). As for the study design, four (67%) used a pre-post design and two (33%) used a post-intervention design. The measures used to gauge effectiveness included subjective data (three studies, 50%), objective data (one study, 17%), and a combination of the two types (two studies, 33%). Four studies (67%) collected quantitative data and two (33%) included both quantitative and qualitative data. Effectiveness outcomes included food security (three studies, 50%), fruit and vegetable intake (two studies, 33%), weight status (two studies, 33%), birth outcomes (two studies, 33%), gestational diabetes (one study, 17%), and other outcome (cardiovascular metrics, one study, 17%). Five studies (83%) reported positive outcomes and one study (17%) reported no change in outcomes. Reported barriers to program effectiveness include the far proximity to the farmer's market to procure foods, redemption relocations due to COVID, and inadequate training of healthcare providers to discuss nutrition education with patients.

All of the grey literature sources reported effectiveness. As for the intervention design, seven programs (39%) used a pre-post design study design, three programs (17%) used a post only design, and eight programs (44%) did not report a study design.

Of the ten programs reporting measures used to gauge effectiveness, seven programs (39%) included both subjective and objective data, two programs (11%) included subjective data only, and one program (6%) included objective data only. Five programs (28%) collected quantitative data and five programs (28%) collected a combination of both qualitative and quantitative data. Study outcomes included fruit and vegetable intake (13 programs, 72%), healthy food intake (three programs, 17%), birth outcomes (two programs, 11%), food security (one program, 6%), gestational diabetes (one program, 6%), and weight status (one program, 6%). Seven programs also reported other outcomes including sense of community, likeliness of seeking medical care at clinics with food pharmacies, inpatient hospital admissions, emergency department visits, maternal stress, economic growth, and quality of eating habits and food choices. Ten programs (56%) reported positive outcomes and one program (6%) reported no change in outcomes. Barriers to program effectiveness included transportation to procure foods, feeling unsafe when shopping at local corner stores, high cost of foods at the farmer's market, misunderstanding program operations, recipients' lack of cooking knowledge, missing vouchers for redemption, limited farmer's market hours of operation, and few grocery stores accepting vouchers. Effectiveness variables are shown in table 3.

Table 3. Effectiveness variables reported by food as medicine for pregnant people programs

Effectiveness Variable	Peer-Reviewed (n = 6)	Grey Literature (n = 18)
Study Design		
Pre-post	4 (67%)	7 (39%)
Post only	2 (33%)	3 (17%)
Other	0 (0%)	0 (0%)
Not reported	0 (0%)	8 (44%)
Primary Outcome[1]		
Fruit and vegetable intake	2 (33%)	13 (72%)
Healthy food intake	0 (0%)	3 (17%)
Food security	3 (50%)	1 (6%)
Gestational diabetes	1 (17%)	1 (6%)
Weight status	2 (33%)	1 (6%)
Birth outcomes	2 (33%)	2 (11%)
Other	1 (17%)	6 (33%)
Not reported	0 (0%)	0 (0%)

Effectiveness Variable	Peer-Reviewed (n = 6)	Grey Literature (n = 18)
Measures Type		
Objective	1 (17%)	1 (6%)
Subjective	3 (50%)	2 (11%)
Both	2 (33%)	7 (39%)
Not reported	0 (0%)	8 (44%)
Data Type		
Qualitative	0 (0%)	0 (0%)
Quantitative	4 (67%)	5 (28%)
Combination	2 (33%)	5 (28%)
Not reported	0 (0%)	8 (44%)
Outcomes[1]		
Positive findings	5 (83%)	10 (56%)
No change in outcomes	1 (17%)	1 (6%)
Not reported	0 (0%)	8 (44%)

[1] Note: percentages do not add up to 100, as multiple categories could be reported

Adoption

All of the peer-reviewed literature reported adoption (i.e., at least some information on where and by whom programs were delivered). The studies took place in four regions of the U.S.: South (two studies, 33%), West (two studies, 33%), Midwest (one study, 17%), and Northeast (one study, 17%). All of the studies were administered through a healthcare provider and one study also included a non-profit organization.

All of the grey literature reported adoption. The programs took place in four regions of the U.S.: Midwest (eight programs, 44%), West (five programs, 28%), Northeast (four programs, 22%), and South (one program, 6%). Delivering organization included healthcare providers (11 programs, 61%), managed care organizations (four programs, 22%), and non-profit organization (three programs, 17%). Adoption variables are shown in table 4.

Table 4. Adoption variables reported by food as medicine for pregnant people programs

Adoption Variable	Peer-Reviewed (n = 6)	Grey Literature (n = 18)
U.S. Region[50]		
Midwest	1 (17%)	8 (44%)
Northeast	1 (17%)	4 (22%)
South	2 (33%)	1 (6%)
West	2 (33%)	5 (28%)
Organization type[1]		
Managed care organization	0 (0%)	4 (22%)
Non-profit	1 (17%)	3 (17%)
Healthcare provider	6 (100%)	11 (61%)
Not reported	0 (0%)	2 (11%)

[1] Note: percentages do not add up to 100, as multiple categories could be reported

Implementation

All of the peer-reviewed literature reported at least implementation metric (i.e., consistency, costs, or adaptions made during delivery). Considering intervention provisions (i.e., what exactly was provided to participants, four studies (67%) provided free produce and two studies (33%) included other provisions, such as connecting participants with food-related resources (Supplemental Nutrition Assistance Program (SNAP), Special Supplemental Program for Women Infants and Children (WIC), food pantries). As for intervention components (i.e., how the provisions were distributed), four studies (67%) provided vouchers to access food, and two (33%) did not report components. Of the studies reporting the frequency of intervention component distribution, three (50%) reported monthly and one study (13%) reported weekly distribution. Intervention settings primarily included farmer's markets (three studies, 50%) and grocery stores (two studies, 33%). Three studies (50%) included education from a healthcare provider. Acceptability, adaptation, appropriateness, cost, feasibility, and fidelity were rarely reported, if at all.

All of the grey literature reported at least one implementation metric. Thirteen programs (80%) provided free produce, four (22%) provided home-delivered meals, and two (11%) provided free food other than produce. Ten programs (56%) provided packaged food, eight (44%) provided vouchers, and two (11%) provided food through coupons. Of the programs reporting the frequency of intervention component distribution, six programs (33%) reported monthly, five (28%) reported weekly, and one (6%) reported bi-monthly. Interventions were primarily delivered in grocery stores (eight programs, 44%) and farmer's markets (eight programs, 44%). Education from a healthcare provider was offered in seven programs (39%) and one program (6%) specifically mentioned offering virtual education. Acceptability, adaptation, appropriateness, cost, feasibility, and fidelity were rarely reported, if at all. Implementation variables are show in table 5.

Table 5. Implementation variables reported by food as medicine for pregnant people programs

Implementation Variable	Peer-Reviewed (n = 6)	Grey Literature (n = 18)
Intervention provisions[1]		
Free produce	4 (67%)	13 (80%)
Free food other than produce	0 (0%)	2 (11%)
Free meals	0 (0%)	4 (22%)
Other	2 (33%)	1 (6%)
Intervention components[1]		
Vouchers	4 (67%)	8 (44%)
Coupons	0 (0%)	2 (11%)
Packaged	0 (0%)	10 (56%)
Other	0 (0%)	1 (6%)
Not reported	2 (33%)	0 (0%)
Intervention frequency		
Bi-Monthly	0 (0%)	1 (6%)
Monthly	3 (50%)	6 (33%)
Weekly	1 (13%)	5 (28%)
Not reported	2 (33%)	6 (33%)
Intervention setting[1]		
Grocery store	2 (33%)	8 (44%)
Farmer's market	3 (50%)	8 (44%)
Other	2 (33%)	2 (11%)
Not reported	0 (0%)	7 (39%)

Implementation Variable	Peer-Reviewed (n = 6)	Grey Literature (n = 18)
Acceptability		
Reported	1 (17%)	2 (11%)
Not reported	5 (83%)	16 (89%)
Adaptation		
Reported	0 (0%)	1 (6%)
Not reported	6 (100%)	17 (94%)
Appropriateness		
Reported	1 (17%)	0 (0%)
Not reported	5 (83%)	18 (100%)
Cost		
Reported	0 (0%)	1 (6%)
Not reported	6 (100%)	17 (94%)
Feasibility		
Reported	1 (17%)	0 (0%)
Not reported	5 (83%)	18 (100%)
Fidelity		
Reported	0 (0%)	0 (0%)
Not reported	6 (100%)	18 (100%)

[1] Note: percentages do not add up to 100, as multiple categories could be reported

Maintenance

None of the peer-reviewed literature reported maintenance. Four of the grey literature programs reported maintenance. Program sustainability methods mentioned included leveraging resources between nutrition- and food security-related organizations and delivering multi-year programs. Maintenance variables are shown in table 6.

Table 6. Maintenance variables reported by food as medicine for pregnant people programs

Maintenance Variable	Peer-Reviewed (n = 6)	Grey Literature (n = 18)
Maintenance		
Reported	0 (0%)	4 (22%)
Not reported	6 (100%)	14 (78%)

Expert Interview Results

Expert characteristics

The team conducted a total of 36 expert interviews. Interviewee characteristics are presented in table 7.

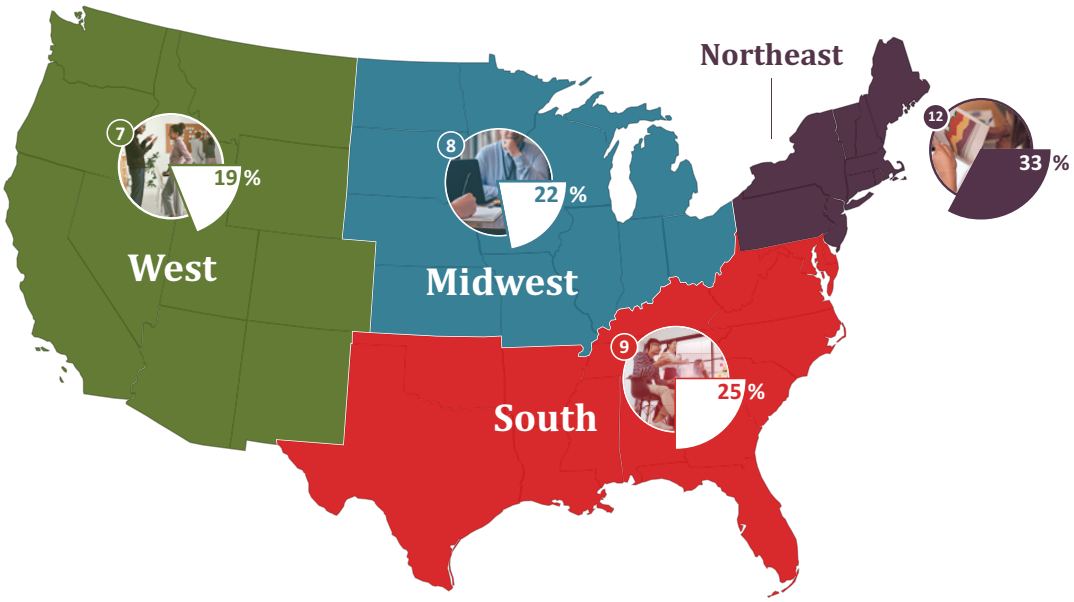
Interview results are presented in the following section, organized by RE-AIM Framework dimensions and implementation strategies that support FAM programming. Each section includes prominent sub-themes that emerged from the data and key interviewee quotes. Quotes are presented verbatim to retain the participants' authentic voices.

Type of interviewee	
Program implementer	16 (44%)
Funder	9 (25%)
Implementation partner	7 (19%)
Policymaker	4 (11%)

Figure 6. Regions of the U.S. represented among expert interviewees

Expert Interviewee Regions of the U.S.

- **Northeast:** 12 (33%)
- **South:** 9 (25%)
- **Midwest:** 8 (22%)
- **West:** 7 (19%)



Reach

Priority populations

The priority populations mentioned among program implementers from most to least frequent were pregnant people; black, indigenous, and people of color (BIPOC); individuals with chronic disease; individuals experiencing food insecurity; individuals receiving Medicaid; individuals with low income; and underserved populations. Less frequently, program implementers mentioned prioritizing urban or rural populations, or reaching a specific geographic area (e.g., a county) rather than a specific priority population.

*"We have had more of a focus on **rural areas**, and **communities of color**, because we know that there's already a bigger gap, a health in the health care outcomes of those communities."*

- Implementation Partner

"The priority populations mentioned by support systems from most to least frequent were BIPOC; pregnant people; location-based; individuals receiving Medicaid; individuals with low income; and rural populations. Less frequently mentioned populations include individuals with chronic diseases; individuals experiencing food insecurity; underserved populations; immigrants; and individuals visiting the hospital frequently."

- Program Implementer

The priority populations mentioned by support systems from most to least frequent were BIPOC; pregnant people; individuals in specific locations; individuals receiving Medicaid; individuals with low income; and rural populations. Less frequently mentioned populations include individuals with chronic diseases; individuals experiencing food insecurity; underserved populations; immigrants; and individuals visiting the hospital frequently.

Overall, the most frequently mentioned populations prioritized through FAM programming interviewees were pregnant people; BIPOC; individuals with chronic disease; individuals receiving Medicaid; and individuals with low income.

Recruitment

Across both program implementers and support systems, interviewees most frequently partnered with healthcare systems to recruit participants. This occurred through word of mouth from practitioners; electronic medical records; screening for food insecurity; high-risk pregnancy indicators; and informing patients receiving Medicaid about the program. Interviewees also mentioned partnering with community health workers, who oftentimes live in and are familiar with the community served. A few programs mentioned partnering with public health departments, such as WIC clinics, to enroll participants.

*"For the referral process. [**Healthcare site** name redacted] identifies those clients based on their predetermined criteria. They provide a **community health worker** with the list of the qualified clients, so the person who is actually doing the home visits with the clients, for those who opt in those community health workers complete their application for [our program]. We get those referrals every week."*

- Program Implementer

Community engagement

Among program implementer and support system interviewees, designing flexible programs centered around the unique communities served increased participation. For example, creating programs based on participant's proximity to resources like farmer's markets, grocery stores, and healthcare clinics was mentioned as important, especially in rural settings. Building relationships in each community was an important part of the design process. To accomplish this, programs engaged community partners and created community advisory groups. As well, FAM implementers mentioned experimenting with offering program materials in more than one language to increase reach.

*"There were several instances of like community engagement around program development and then, a couple of times **we would have focus groups with participants.** It was initially piloted with a small population in early 2017, with a set of feedback, including compensating them for their time to give them feedback. **Edits were made to the program before implementation.** We've been really cognizant of that community engagement component."*

- Program Implementer

Barriers to reach

Both sets of interviewees mentioned that many of the FAM programs for pregnant people are pilot studies and new to the communities they are in. Thus, participant awareness was the most frequently mentioned barrier to enrolling participants. In addition, interviewees mentioned healthcare providers are at full capacity and adding another talking point or step to enroll patients can be burdensome.

*"**[Healthcare providers] are already way overworked, overburdened** and everybody is asking them to add in this question or just add in this one thing. It's like you know what they're way overbooked for that 10 or 15 minute appointments they have anyway."*

- Implementation Partner

Effectiveness

Outcomes

The evaluation outcomes mentioned by program implementers, in order of frequency, were birth outcomes; acceptability (i.e. participants' perception that the program was agreeable or satisfactory); chronic disease prevention indicators; nutrition patterns and practices (including food security status); program utilization (i.e. voucher redemption rates); return on investment; patient-provider relationships; mental health; and community agriculture support. Less frequently mentioned outcomes included social connectedness and knowledge/awareness.

> *"We are measuring **birth weight and gestational age of the baby**, and the birth weight, that's 2500 grams or more is considered a positive outcome. The early gestational age is 30 where our goal is 39 weeks or more."*
>
> - Program Implementer

The outcomes mentioned most to least frequently by support systems included return on investment; nutrition patterns and practices; chronic disease prevention indicators; program utilization; acceptability; birth outcomes; patient-provider relationships; and number of participants. Less frequently mentioned outcomes included knowledge/awareness; social connectedness; mental health; and community agriculture support.

Overall, the most frequently mentioned outcomes across both interview groups were nutrition patterns and practices; chronic disease prevention indicators; acceptability; return on investment; and birth outcomes.

> *"We look at the health end, they'll tell us about complications. They look at NICU rates of utilization, they look at total cost of care, and that includes length of stay in the hospital. Typically, there's a longer length of stay with a C-section than an uncomplicated birth, for example."*
>
> - Implementation Partner

Data collection methods

Data collection methods varied between program implementers and support system interviewees and depended on organizational capacity and funding source. Interviewees mentioned quantitative measures including pre- and post-program food insecurity surveys; birth outcome data via health records; and frequency and use of FAM dollars. Interviewees also collected qualitative data through interviews with participants about the acceptability of the program. Some data were not formally collected, interviewees mentioned anecdotal information from participants and healthcare providers. Some organizations used an external evaluator to measure program outcomes.

> *"We're hopeful some other data we could get is around the delivery of the baby. Like gestational age, baby's weight, baby and mom's blood glucose method of delivery, complications of delivery and things like that.* ***Those are harder to get because we need to get those from the health plan."***
>
> - Program Implementer

Evaluation barriers

Program implementers mentioned challenges with data collection. For example, the short duration of programs made it difficult to measure long-term changes. As well, long surveys were burdensome for participants, resulting in high incompletion rates. Finally, connecting with healthcare providers to access participant biometric data was difficult. In general, many interviewees mentioned that FAM programs are in the pilot phases. For FAM programs for pregnant people specifically, support system interviewees mentioned a lack of evidence and focused on the need to build evidence to support sustainable programs.

> *"[There are] deeper questions around* ***how long should a program last for us to see effectiveness****, having to do with cost?* ***What does the healthcare system have to invest in terms of time*** *for a program like this, they want to know about* ***duration****, and they want to know about* ***dose, how much money*** *needs to be on this incentive program for a patient."*
>
> - Funder

Adoption

Outer setting: the economic, social, and political context

At the outer setting, policies and laws, financing, partnership and connections, and external pressure were reasons mentioned to adopt FAM programs. Support system interviewees focused on the policies and laws around FAM, while program implementers focused on partnerships and connections and financing. For example, support system interviewees highlighted the importance of National policy attention of addressing SDOH through Medicaid objectives. Financial stability and community collaborations were important reasons for implementers to adopt FAM programs.

> *"More recently* ***the regulatory environment has shifted****, so there's opportunity within the regulatory environment in both Medicaid and Medicare to deploy medically tailored meals and perhaps produce prescriptions that hasn't gotten off the ground like medically tailored meals has for healthcare, in general, across the nation, we're seeing health care, play in Medicare and Medicaid and medical home meals, and then not yet in produce prescriptions."*
>
> - Funder

Inner setting: organizational structure and culture

At the inner setting, interviewees mentioned that FAM programming aligned with their organizations' visions or mission. This was mentioned more frequently among support system interviewees than implementers. For example, interviewees mentioned that their organization already has FAM programs for other populations and expanding to include pregnant people seemed feasible. Other interviewees mentioned that their organization is already involved with maternal health and expanding to include FAM programming seemed feasible. For example, an interviewee mentioned their organization's mission is about preventative health strategies and FAM programming aligns with this work. Another interviewee mentioned that FAM programming aligned with their food security strategy.

> *"**Before Food as Medicine became such a popular term**, technically, we've kind of been providing those type of services since existence. Since we started off **in the early stages of the HIV and AIDS pandemic**, we've been providing meals for individuals with chronic conditions."*
>
> - Program Implementer

Innovation: characteristics of the intervention

Program implementer and support system interviewees mentioned that the ability to pilot FAM on a small scale was a factor that led to program adoption, and often resulted in scaling out programming or preparing for a larger study. Interviewees discussed that experimenting with recruitment strategies, intervention components, and effectiveness outcomes during the pilot phase.

> *"It is also important to note, **this is a smaller pilot, so when we think about our process for testing, often it's really around feasibility and desirability, before we go full into something like a randomized control trial or a more official study."***
>
> - Funder

Individuals: those involved with the intervention

The needs of the priority populations, including food insecurity and health disparities, was a primary reason for adoption FAM programming. Program implementer and support system interviewees discussed a desire to improve health outcomes through adopting FAM programming. Interviewees also mentioned program champions or staff with a strong interest in FAM or maternal health leading to program adoption.

> *"That all this work is about, especially for expectant mothers **we would like expectant mothers to have the best nutrition that they can have**, from the moment that they realize that they're expecting, and that access to good nutrition continues not only through pregnancy, but on through when the mom is nursing, but then on to the beginning of solid foods. It's about that child getting the best start in life as possible. It also creates this culture, if the mom is eating good, then most likely the rest of the family is going to eat well."*
>
> - Program Implementer

Implementation

Duration

Program duration was divided into two categories: defined (i.e., a specific enrollment and program timeline) and undefined (i.e., no specific timeline). Program implementers noted total program durations ranging from three to 18 months. Many programs provided components through the postpartum period, ranging from two to six months. Implementers mentioned wanting to enroll participants as early in their pregnancy as possible. Support system interviewees mentioned shorter total program duration, ranging from two to 16 weeks. Overall, duration was often categorized as undefined.

Components

Program implementers and support system interviewees shared FAM program components, from most to least frequently mentioned, groceries; medically tailored meals; and produce prescription. Depending on the program, participants received vouchers; electronic benefits cards; coupons; tokens; pre-packaged boxes of food; or ready-to-eat meals. Vouchers, tokens, and coupons could be used at local grocery stores or farmer's market. Programs providing pre-packaged boxes of food included unprepared ingredients for meal preparation or included groceries from all food groups. Interviewees also discussed providing meals for the entire family, versus just the pregnant person. Some programs altered components from pregnancy to postpartum to aid in the transition. For example, a family could start by receiving a box of groceries and transitioned to ready-to-eat meals once the baby was born. Connecting participants with wraparound resources was another component of some programs. These include referrals to SNAP; WIC; food pantries; and support services.

> *"We developed paper vouchers, that we mailed out to participants that are valued at $45 that they can then* ***use in the store in their community."***
>
> - Program Implementer

Education

When providing education, many program implementers shared about the partnership with local healthcare systems to out-source education delivery. For example, dietitians at healthcare clinics developed written materials, led virtual nutrition education classes, or hosted in-person classes. Written materials were the most frequently mentioned method for delivering education, as recipe cards, brochures, or flyers could go in grocery boxes. Few interviewees mentioned tailoring education components to pregnant people. Interviewees discussed how pregnancy may be a stressful time in a person's life with lots of changes and doctor appointments, so intensive education was not a feasible option. For example, interviewees mentioned experimenting with designing apps and interactive chats to create a sense of community among practitioners and participants. Virtual programming was offered in several ways, such as online classes, to improve reach and retention. Future goals for educational programming were developing materials and offering classes in more than one language to improve reach.

> *"Preceding [patients] getting meals, they see the* ***dietitian, and have a group nutrition education class****, it's about a two hour long class, and they go over all the basics of gestational diabetes to how to make a healthy meal and living with that with that disease."*
>
> - Program Implementer

Partner organizations

Developing local partnerships is important among program implementers and support system interviewees. The most frequently mentioned partnerships were with healthcare systems to help apply for funding, recruit participants, build evidence for effectiveness, and improve program maintenance. The second type of partnership mentioned was with food vendors such as community pick-up sites (e.g. schools or Cooperative Extension Service offices) and delivery services. The third type of partnership mentioned was food retailers such as grocery stores; farmer's markets; and Community Supported Agriculture programs (CSA).

Adaptation

Program implementer and support system interviewees shared adaptations specific to FAM programming for pregnant people. Adaptations mentioned from most to least frequent include tailored foods; distribution model; technology; and research protocols. Programs are experimenting with providing participants opportunities to self-select food at the grocery store; farmer's market; or shopping online. Another way programs are implementing self-selection is by adapting online ordering systems or electronic benefits cards. Self-selecting foods also enhances cultural sensitivity. Some interviewees mentioned already delivering components to participant households, while other interviewees are experimenting with delivery and pick-up.

Cost

Program implementer and support system interviewees mentioned combining multiple funding sources for program implementation. Funding sources mentioned from most to least frequently include foundation dollars; government grants; health insurance providers such as Medicaid; and Gus Schumacher Nutrition Incentive Program (GusNIP). Foundation funding was provided from Robert Wood Johnson Foundation; Blue Cross Blue Shield Foundation; Boeing; Monsanto; Bank of America; and others. Government grants mentioned included USDA; CARES Act Coronavirus Relief Fund; Special Diabetes Program for Indians (SDPI); Ryan White HIV/AIDS Program; and public health departments. Specifically, several interviewees mentioned GusNIP (grants through the USDA for produce prescription projects) as a funding source.

*"[Home delivery] is super helpful **if you really want [participants] to eat more produce to bring the produce to them instead of expecting them to have to go shop somewhere**. In rural areas, we definitely should include that as an option. If the provider is able to, like we deliver four times a week across the entire county. It's just as easy for us to deliver and it's way more cost effective, because of the amount we don't have to pay for the farmers market redemption and management and all that stuff."*

- Program Implementer

*"We have three programs that directly benefit, potentially pregnant people. One is a contract with **a national organization, that prepared meals to someone's home address**. Now those meals are condition appropriate slash medically tailored, and they have several menu options."*

- Funder

*"South Carolina, where we did the prescription program, actually South Carolina was the first state as far as I know, in the country, that **state funded an incentive program.** We took the results from the study that we did at the FQHC and we're able to work with a local poverty rights activist group. In 2013, the state of South Carolina I think it was for half a million dollars funded the statewide Nutrition incentive program."*

- Implementation Partner

Barriers to implementation

Barriers to implementation were shared across interviews with program implementers and support systems. Most to least frequently, they included logistics; funding; scale-up; and transportation. Logistics barriers included processing invoices for grocery stores as point of sale (POS) systems varied from store to store; arranging participant food pick-up; receiving referrals too late; and redemption sites such as farmer's markets being closed during the COVID-19 pandemic. Interviewees mentioned that participant transportation to obtain food was an issue, and home delivery could help circumvent the challenge. Funding challenges included inconsistent streams of funding; different funding cycle durations; expenditure requirements; and the high expense of program operations. Interviewees suggested lengthening the participation window and funding cycle for maintenance of programs. This way practitioners feel comfortable referring patients to a well-established program versus a program that will fade away quickly. Many interviewees were processing next steps for implementation and their organization, which oftentimes involved increasing reach and retention. Interviewees shared advice about ensuring the organization has the capacity both from a personnel and infrastructure standpoint.

*"The program is **funded through multiple sources.** It is through donations and grants. There are several foundations. There are health care agencies that have funded it…"*

- Program Implementer

Maintenance

Program implementer and support system interviewees mentioned four key factors to maintaining FAM programming (i.e., for longer than six months after the original intervention). See Figure 6. Policy changes were the most frequently mentioned factor to build a sustainable program. This include making FAM programming a reimbursable benefit through health insurance, specifically Medicaid.

*"Our health plan partner is a Medicaid managed care organization. So right now [it] is being funded under the foundation. So philanthropically but **ideally, we would like to be funded as a benefit on the plan [Medicaid]**, so it could serve more people."*

- Program Implementer

The second most frequently mentioned sustainability factor was acquiring a stable funding source. Interviewees shared that FAM programs are expensive to operate from procuring and distributing the components to the operative personnel expenses.

The third mentioned sustainability factor was building evidence of FAM program effectiveness. Interviewees mentioned the need to build evidence to support healthcare systems and MCOs to fund and advocate for policy changes. The fourth mentioned factor of maintenance is building partnerships. Program implementer and support system interviewees mentioned partnerships with managed care organizations like Medicaid and healthcare systems for program longevity.

*"I think that would be primarily the conversations we're seeing is that **we can get those pilot programs where we can get one year, and then how do we get the second how do we really plan for something with a long-term goal when you have those short-term funding pieces."***

- Implementation Partner

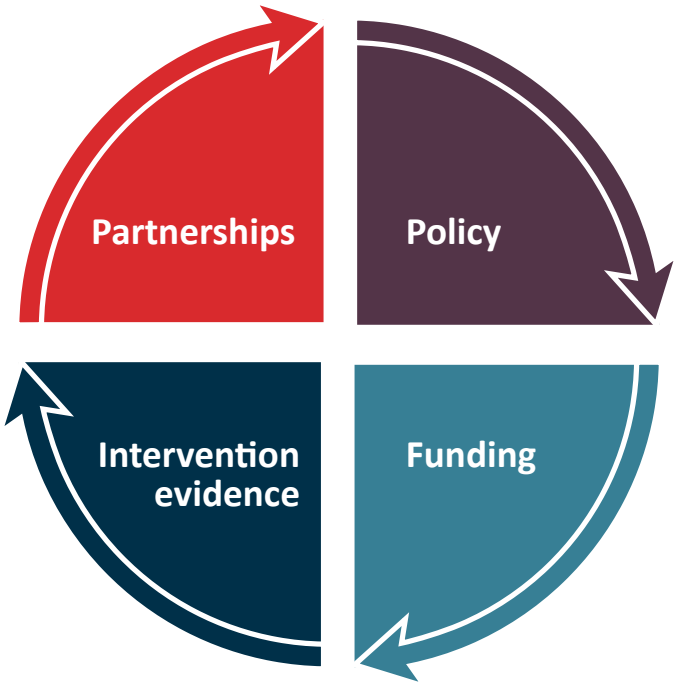
Supporting the Work: Implementation Strategies

Finally, interviewees also discussed the need for methods or techniques to improve real-world delivery of FAM programs. These implementation strategies are reported separately from FAM adoption, implementation, and maintenance, as they typically are an additional "level" of intervention designed for the staff and settings who deliver programs. For example, support system interviewees mentioned developing curriculum for educators and practitioners to talk about nutrition or prenatal health with pregnant clients.

The priority population for this type of education is providers rather than clients and is therefore considered an implementation strategy. The discussed implementation strategies among program implementers were training and educating partners and using financial strategies. Developing and maintaining partner relationships at national and local levels helped facilitate successful collaborations and improve program delivery. Interviewees shared that partnering with collaboratives or others in FAM programming is particularly beneficial to learn tested practices, especially for new implementers.

When working with implementation partners, interviewees suggested hosting multiple training sessions to increase awareness and buy-in. Structural adaptations interviewees suggested are having a USDA inspected on-site kitchen to prepared components and a delivery vehicle.

Figure 6. Factors leading to program maintenance



*"[It is helpful to have] a **good partnership with the community or referring agency**. Just to make sure you have the referrals and the clientele to provide the service and how engaged they are? Sometimes if they're not that engaged, then that's going to impact your program as well, too."*

- Program Implementer

Support system interviewees mentioned implementation strategies listed most to least frequently, using financial strategies; developing partner relationships; supporting delivery agents; engaging priority populations; and changing infrastructure.

Overall, the most frequently mentioned implementation strategies were using financial strategies; developing partner relationships; supporting delivery agents; engaging priority populations; and changing infrastructure.

> ***"We're focused on iterating the program and making sure it's the best program for the community that we're serving.*** *We learned from our mistakes in the past, and try to be more involved, but not like hover or not running or managing these programs, because they're professional, but we're here as a resource and support. We're very flexible."*
>
> - Funder

Overall Findings

The overall findings summarize the systematic review and expert interview results and describe research gaps for future work.

FAM programs reached multiple populations

FAM programs are reaching pregnant people. However, implementers delivered programs in specific geographic areas based on resources and connections built within the community. Pregnant people experiencing health disparities were prioritized within these communities for enrollment. Although specific geographic areas were prioritized, few interviewees mentioned engaging individuals with health disparities in program design. Co-creating FAM programs with program staff and priority populations ensures fit with community resources and may expand reach to households experiencing inequities, such as BIPOC and immigrant communities. Finally, partnering with healthcare organizations to facilitate recruiting and enrolling pregnant participants could enhance FAM program awareness.

Research gaps: Future work should explore populations experiencing health disparities, such as BIPOC and underserved communities. To address the participant awareness barrier, future FAM programs could create a community group to co-create initiatives. As well, there is a need for consistent reporting of reach across programs and organizations. Additional reach metrics, such as number of pregnancies and household size, could be beneficial for adapting future programs to meet participants' needs (e.g., providing additional produce for the entire family).

FAM program effectiveness measures varied

Effectiveness outcomes varied from program to program and oftentimes depended on the organization's capacity. For example, fruit and vegetable intake was the most frequently mentioned outcome measured among the sources in the systematic review, while interviewees mentioned birth outcomes and return on investment most frequently (i.e., cost saving resulting from an investment of resources at a specific point in time). These metrics were not measured consistently across programs. As one example, multiple different surveys were used to assess nutrition patterns and practices (including food security), and there was no set standard. GusNIP's NTAE Center (www.nutritionincentivehub.org) provides core measures that FAM programs for pregnant people can consider.[57] Overall, measuring effectiveness

is challenging, with barriers including difficulty obtaining data and burdensome measures.

Research gaps: To reach the long-term goal of building evidence for FAM programming for pregnant people, implementing shared measures and metrics can promote consistently measured and reported data. Initiating partnerships with healthcare clinics and MCOs may help with data sharing to build evidence for longer-term programs. Related, return on investment outcomes also require longitudinal measurement, as short-term costs may be higher (e.g., through more regular prenatal visits) and long-term costs (birth outcomes and beyond) are potentially lower.

Multiple factors led to adoption of FAM programs

The reasons for adopting FAM programs occurred at multiple levels: innovation, individuals, inner setting, and outer setting. Targeting these adoption factors at multiple levels could influence program implementers to adopt maternal FAM programs increase program delivery across the country. For example, interviewees mentioned adopting maternal FAM programs because they aligned with their organization's mission. Thus, organizations who currently implement FAM programs among other populations or organizations that already work with pregnant people may be interested in adopting a FAM program for their patients.

Research gaps: While this project explored adopters of maternal FAM programs, future research should explore the landscape of non-adopters. Additionally, future research should explore the landscape specifically among states who have Section 1115 Medicaid demonstration waivers versus states without 1115 waivers.

FAM program components vary widely

Program components including free or reduced cost food, support services, and community partnerships varied between organizations and locations. Programs identified through the systematic review and interviews provided free or reduced cost food through grocery stores and farmer's markets, pre-packaged food boxes, and ready-to-eat medically tailored meals. Providing support services such as nutrition education, access to food, and

connections to social services was also reported among interviewees and systematic review sources. Currently, all programs were implemented differently. Interviewees mentioned that building FAM networks is typically done through word of mouth, as a council of key partners does not exist.

Research gaps: Future research should identify the core functions and adaptable forms of maternal FAM programs. To identify the core functions, gathering a council of FAM experts is suggested. One objective the council could prioritize is to develop a toolkit of best practices for consistent nationwide program implementation.

Evidence, policy, and funding could lead to sustainable FAM programs

Interviewees shared four pieces essential to the sustainability of maternal FAM programs: policy change, funding, building evidence, and partnerships. Of interest to healthcare systems and MCOs is building evidence on the return on investment, birth outcomes, and hospital utilization. Disseminating this evidence to policymakers may help support changes like reimbursing FAM functions.

Research gaps: Future research should determine strategies to integrate policies at healthcare, local, state, and national levels.

Supporting the work: implementation strategies

With the evolving landscape of FAM programs, organizations shared necessary implementation strategies including developing partner relationships, financial strategies, supporting delivery agents, changing infrastructure, and engaging priority populations.

Research gaps: Little is known about which implementation strategies are most effective for improving the adoption, implementation, and maintenance of FAM programs. Future research should describe and test specific implementation strategies to build the evidence on how to best support program implementers.

Implications for FAM programming for pregnant people

In conclusion, the current findings present the landscape of FAM programming for pregnant people and identify gaps for increasing the adoption, consistent implementation, and long-term maintenance of programs. GSCN created a suggested roadmap (Figure 7) of next steps for maternal FAM programming. Given GSCN's past and present working relationships with key FAM interest organizations and experience conducting research and strategic evaluation work within public health nutrition, future collaborations between Share Our Strength and GSCN could accomplish these next steps.

Build a council of key partners

This analysis shows that partnerships are key to success FAM programming. A way to ultimately change policy is to build a council of key partners. This council should include members from states with Medicaid 1115 demonstrations, healthcare systems, program implementers, and researchers. As mentioned in this report, prioritizing building evidence on maternal FAM programs is essential. Building the council first will lead to identifying key partners and motivators in FAM discussions and lead to shared measures and consistent programming.

Explore the landscape of FAM programs reaching pregnant people in BIPOC communities

This analysis shows that FAM programs are reaching all regions of the U.S. and oftentimes prioritize the local geographic location where organizations are based. This leaves much room for improvement in reaching BIPOC communities, who experience higher health inequities and could benefit from FAM programming. Identifying key partners in BIPOC communities is essential to improving healthcare access in historically underserved populations.

Build on shared measures

As shown in this report, effectiveness measures were inconsistently collected and reported across FAM programs for pregnant people. This makes building evidence for FAM programs difficult and confusing to healthcare organizations and MCOs. Leveraging and building on the GusNIP NTAE shared measures and metrics that are relevant for pregnant people.

Identify core functions and adaptable forms

There is great variety in the functions of FAM programming which may be confusing for those adopting and adapting programs. Identifying a core set of functions and adaptable forms is essential for consistent programming across the U.S. For example, this could include the core function of FAM programming (provision of food) and a menu of options for forms this could take (e.g., vouchers vs. coupons, deliver vs. pick-up). Developing shared measures and understanding components of effective vs. less effective programs could lead to developing these core functions and forms.

Adapt educational materials for FAM programs for pregnant people

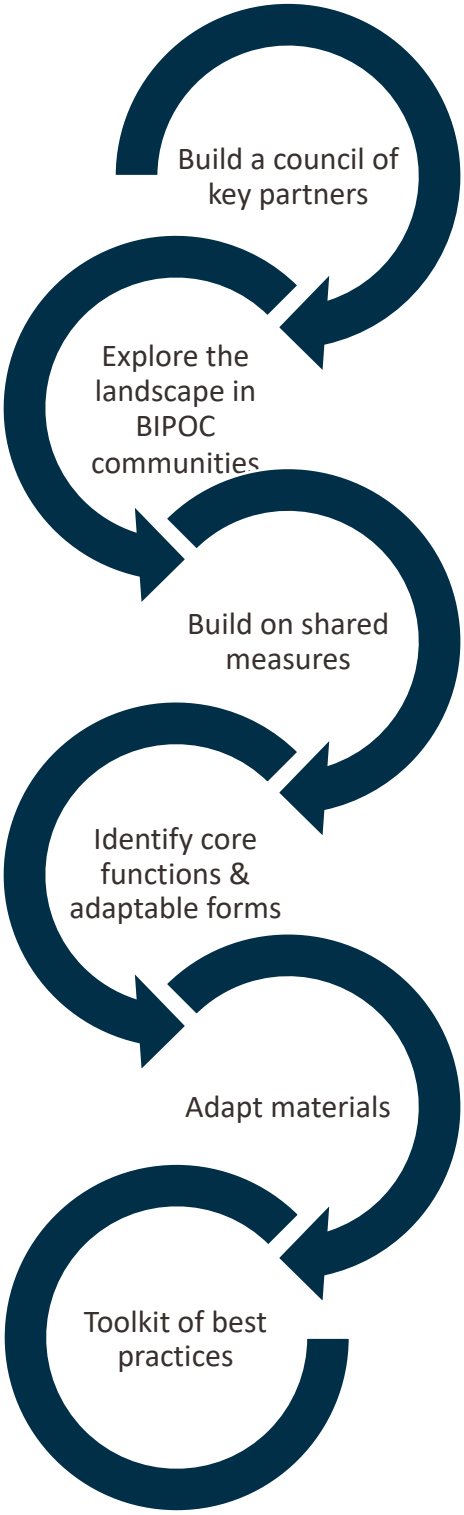
Some programs delivered tailored education to pregnant people, while other programs delivered more general education. Adapting written materials such as brochures or curriculum for classes is essential for consistent programming and organizations are aware of the capacity needed. Once materials are adapted, the acceptability, feasibility, and appropriateness should be tested among the intended audience (i.e., pregnant people).

Construct toolkit of best practices

These implications ultimately lead to constructing a toolkit of best practices for maternal FAM implementation. The toolkit could include key partners, suggested evaluation metrics and measures, core functions, and adaptable forms. Ensuring the toolkit is accessible to key partners including policymakers, funders, implementation partners, and program implementers is essential.

Disseminate findings

The Gretchen Swanson Center for Nutrition hosted a webinar on the findings from the landscape analysis of FAM programs for pregnant people. Share Our Strength team, the Gretchen Swanson Center for Nutrition team, program implementers, funders, managed care organizations, and others were invited to attend. In collaboration with Share Our Strength, the Gretchen Swanson Center for Nutrition will be preparing two manuscripts for peer-reviewed publication. The aim of manuscript 1 is to report the systematic review findings. The aim of manuscript 2 is to report the expert interview findings. The Gretchen Swanson Center for Nutrition also submitted an abstract for presentation at a FAM-related conference.



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Appendix A. Search Strategy for the Systematic Review

1. Peer Review Search Terms
    a. ((“food-is-medicine”[Title/Abstract] OR “food-as-medicine”[Title/Abstract] OR “food insecurity”[Title/Abstract] OR “food access”[Title/Abstract] OR “nutrition incentive”[Title/Abstract] OR “produce prescription”[Title/Abstract] OR “nutrition security”[Title/Abstract] OR “food security”[Title/Abstract])) AND ((pregnant*[Title/Abstract] OR prenatal[Title/Abstract] OR antenatal[Title/Abstract])

2. Grey Literature Search Terms
    a. “Food as Medicine” and “Prenatal
    b. Produce Prescription” and “Prenatal”

Appendix B. Expert Interview Guide

1. To get started, could you please describe your current title and main responsibilities within *[organization name]*?
    - PROBES: length of time in current role, fit within overall organizational structure

As we start talking about your organization's programming, I'll explain the terminology I'll be using throughout the interview. I'll be referring to the interventions we're interested in as food as medicine. We use this term broadly to include programs that combine nutrition and healthcare, including medically tailored meals, medically tailored groceries, produce prescription programs. We are interested in any programs that connect people who are experiencing poverty and have a diet-related chronic disease (e.g., Type 2 diabetes) with a healthcare practitioner to "prescribe" healthier foods such as fruits and vegetables at low or reduced cost.

2. Can you walk me through how [organization name] decided to implement food as medicine programming for pregnant people? [Adoption]
    - PROBES: motivation from community, patients, funder, payor, policy?
    - How did leadership and others across the organization react or buy-in to the idea of addressing food is medicine for pregnant people?
    - What was the process in deciding what specific activities would be rolled out?
3. **FOR policy/funder interviews:** What is the most common way you learn about new guidelines or evidence?
    - PROBES: what are the most common sources of this information? Email, internet, publications
    - Let's talk more about ____.
        1. Why is that important?
        2. What works well about _____?
- What improvements are needed to make sure you get the information you need?
- Who typically shares this information? (coworkers, supervisor, external colleagues)
- What information or evidence is most important to you when making policy / funding decisions?

4. Can you describe the priority population for your program? *[Reach]*
    - PROBES: to what extent does your project work with any of the following underserved communities: tribal communities, communities of color, LGBTQ+, individuals with disabilities, Veterans, rural and remote communities, or communities with residents predominantly living under the Federal poverty line
    - What was the need for food as medicine programming for the population(s) your program serves?
    - How was this population included in designing or adapting the program?
        1. What methods of community engagement were used?

5. *(If not described above)* Can you describe the specific components of the programming/initiatives that *[insert organization name]* has implemented? *[Implementation] Note to interviewer: have reports and program descriptions available to probe on specific components.*
    - What is the overall goal or desired outcomes of your program?
    - What do you provide to your clients?
        1. PROBES: free or reduced cost produce, other food, meals
    - How do they access these foods?
        1. PROBE: vouchers, tokens, or coupons
        2. PROBE: frequency of services
    - Is an educational program included?
        1. PROBES: program/curriculum name, dose (sessions, length, resources), behavior change strategies
        2. PROBE: do you use goal setting, self-efficacy, self-monitoring in your program?
    - How well does the programming fit with existing work processes and practices in your organization? *[compatibility]*

    1. PROBES: specific partner organizations that were involved

6. What considerations or changes did you have to make to your programming to be effective for pregnant people? [Implementation]
    - Have you made any changes to enhance diversity, equity, and inclusion?
        1. PROBE: if there is an educational component: How is the education tailored for pregnant people?
7. Can you share how the program is financed?

[Implementation – cost] **For funders/MCO ask— Can you tell us more about the funding you provide to food as medicine programs and how it is accessed?**

- What Managed Care or Health Maintenance Organization are you connected with in this work?
- Do you expect to have sufficient funding to continue to implement the program? How will you obtain the necessary funding? *[available resources]* **For funder/MCO- Do you expect to continue to fund these food as medicine programs?**

8. What metrics or measures do you use to determine if your programming is effective? What have you found so far? *[Effectiveness]*
   - PROBES*:* survey (e.g., fruit and vegetable intake, other self-report surveys)? Clinical outcomes? Healthcare cost and utilization? Electronic Health Record?

9. Do you expect this work to continue permanently? *[Maintenance]*
   - PROBES: become part of the organizational culture? Incorporate into written policies or blueprints? What barriers exist to it continuing?

Wrap-up: *Finally, we just have a few closing questions*.

10. What have been the "bright spots" or wins of implementing your food as medicine programming for pregnant people? What challenges did your organization experience?
    - PROBE: what will you do differently in the future?

11. What advice would you give to other organizations wanting to implement food as medicine programming for pregnant people?

12. What other innovative programs in the field of food as medicine are there for pregnant people? Who else should we interview to learn more?

13. Are you or your organization interested in being part of a directory of programs helping pregnant people?

As a reminder, we will be emailing you a $30 electronic gift card to your email.

That concludes our interview. Thank you so much for your time and sharing your insights with us!

Appendix C: Expert Interview List

Program Implementer

Capital Area Food Bank[1]
Need More Acres Farm[1]
Community Farm Alliance[1]
Ceres Community Project[1]
Operation Food Search[1]
Yukon-Kuskokwim Health Corporation[1]
Waianae Coast Comprehensive Health Center[1]
Produce Perks Midwest[1]
Open Hand Atlanta[1]
Community Servings[1]
Open Arms of Minnesota[1]
New York City Health + Hospitals[1]
Brighter Bites[1]
Vouchers for Veggies[1]
Case Western Reserve University (2 interviewees)[1]

Implementation Partner

American College of Lifestyle Medicine[1]
Wholesome Wave[1]
University of North Carolina[2]
Duke University[2]
Nutrition Oregon Campaign[2]
Umoja Supply Chain[1]
Moms Meals[1]

Funder

Kaiser[2]
Humana[1]
AmeriHealth Caritas[1]
CareSource[1]
Molina HealthCare[2]
Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, Obesity[2]
Feeding America[2]
Vitamix[1]
Rockefeller Foundation[2]

Policymaker

Center for Health Law and Policy Innovation[2]
Food is Medicine Task Force[2]
United Stated Department of Agriculture, Special Supplemental Nutrition Program for Women, Infants, and Children[1]
Grantmakers in Health[2]

[1] *Indicated FAM program for pregnant people*
[2] *Indicated FAM program not specific to pregnant people*

Appendix D: Representative Quotes from Program Implementer Interviews

Note: Numbers in parenthesis represent the number of meaning units (words, phrases, or sentences that contain related content relaying a specific thought or idea) for each category, subtheme, and theme. Quotes are presented verbatim to retain the participants' authentic voices.

Theme	Subtheme	Category	Representative Quote
Reach (n=201)	Priority population (n=119)	Pregnant (n=20)	"Pregnancy or postpartum, up to six months postpartum, and then food insecure."
		BIPOC (n=19)	"Certainly, communities of color are primarily, I think we're trying to reach broadly..."
		Chronic disease (n=16)	"But we're just really determined to create access for individuals who are affected by diet related illness, then then we still have criteria, but it's not quite as rigorous."
		Food insecure (n=13)	"They also are predominantly living under the poverty line. I don't know that we're screening for financial, but we are screening for food insecurity. And generally, those are kind of tied together."
		Medicaid (n=11)	"The other great thing about [our program] being tied to Medicaid and not necessarily other benefit programs, is the income qualification for Medicaid, at least in Kentucky, is higher than the qualifications for SNAP and WIC. So, for participants, the beauty of it is that participants who may kind of fall between the cracks of other program requirements, they would still qualify for [our program] with Medicaid insurance."
		Low income (n=9)	"Like less than 10% of our patients are white, they're overwhelmingly low income."
		Underserved (n=7)	"My passion other than reaching out directly, intention being intentional about working with the refugee communities."
		Other (n=7)	"We work with a lot of older adults and people living with HIV and AIDS."
		Urban (n=6)	"So majority, definitely. Urban. Within the, I would say within the city, but we call the city like 20 counties. So within that kind of metro area."
		Location-based (n=6)	"I mean, we're in [county redact] County. So, there's a fair number of LGBTQIA people."
		Rural (n=5)	"And we you know, because most of our members are in rural communities, I mean, we just have this affinity for, for rural Kentucky and wanted to make that make it work for rural communities…"
	Recruitment (n=51)	Healthcare system (n=28)	"The health care contract partners are doing are doing screenings for food insecurity and everyone through this flexible services program who gets referred to us screens positive for food insecurity."

Theme	Subtheme	Category	Representative Quote
		Community health worker (n=13)	"We work directly with the clinic, clinician health care provider, and that can be a navigator, a community health worker."
		Health department (n=7)	"We opened it [our first pilot study] up to any participants, and then they like I said they had to go to the health department or free clinic to sign up."
		Word of mouth (n=3)	"The initial one was definitely word of mouth. I don't recall that we blatantly announced that we were doing this that I can recall."
	Community engagement (n=25)	Patient-centeredness (n=15) Flexibility (n=11) Cultural Awareness (n=4)	"… we want to be really mindful of meeting people where they're at with this program… because we know that if they're engaged in the health care system and have this health worker following them, we're doing everything we can to make sure that they're supported."
		Co-creation (n=6)	"And so going back and then working with people, we already had built relationships with who understood what we were talking about what we were wanting to do, made a big difference."
		Relationship building (n=4)	"Really this strength of all this is dependent upon the community and the commitment and relationships and partnerships at the community level. You know, having community champions is really what makes or breaks it."
	Barriers (n=6)	Participant awareness (n=3)	"We only had a 10% redemption rate [for our first pilot study]. What we also discovered is that very few of them were seeing a doctor pretty regularly… we also needed to work with a demographic that's going to be seeing a doctor regularly enough that we're actually going to be able to capture some data during the program."
		Provider obligation (n=3)	"I just think the turnover is so high right now in the medical field, that it has been challenging for some of our providers to kind of maintain programming in the way that they'd like to."
Effectiveness (n=202)	Outcomes (n=148)	Birth outcomes (n=24)	"We're measuring birth outcomes as far as full-term birth rate, birth weights, the NICU use rate and then other data collected by the dare delivery and claim system."
		Acceptability (n=24)	"We ask for food feedback, we ask for comments on the delivery method or interactions with client services, things they'd like to see on the menu, things that they don't like to see on the menu, if the food fits their cultural preferences."
		Chronic disease indicators (n=19)	"We're looking at several outcome diagnoses of gestational diabetes, pregnancy induced hypertension."

Theme	Subtheme	Category	Representative Quote
		Nutrition patterns and practices (n=16)	"The other outcomes we are looking at are behavior change, improvement in cooking skills, improving nutrition knowledge and awareness of how to access healthy food."
		Program utilization (n=12)	"We look at the market report to see monthly, how many participants are in the program, how many times the person came. We're tracking attendance, we're tracking how many tokens are spent."
		Return on investment (n=11)	"What is really exciting about [the pregnant] population is most health plans want an ROI, for this year, not five years from now. If we reduce complicated birth outcomes which gives a plan for ROI, but at the same time, we're actually working with a population that's really upstream."
		Number of participants (n=10)	"We currently have a little over 50 pregnant women enrolled in the program."
		Provider- patient relationships (n=9)	"The goal is to strengthen that health care provider relationship with the participant. That has been a really positive, bright spot in this as well, because that is so important during pregnancy. We have been able to influence that relationship. This program is appreciated by healthcare providers to be able to offer to their patients."
		Community agriculture (n=7)	"Our desired outcome would be that 100% of the funding would go to support Kentucky agriculture, to support the local food community…This is a way for us to create economic growth and vitality for our communities."
		Mental health (n=7)	"We're doing a depression screen. They're looking at some mental health and coping skills."
		Social connectedness (n=4)	"[Another outcome] would be just the connection that people have when they participate in these programs to one another, and how much benefit there is for them to for the community and the connection and the relationships, and how much that improves people's health as much as the food."
		Knowledge and awareness (n=3)	"The surveys asked about food security, fruit and vegetable consumption, self-efficacy related to healthy eating. Things like 'I'm able to make a snack through our meals', 'I'm able to eat fruits and vegetables for a snack instead of a packet of pretzels or sweets."
		Other (n=2)	"We're actually taking stool samples to study the gut microbiome, the skin carotenoids [in our kid's program]. So those are all new measurements that are going to be included in this next round of produce prescriptions for catering."
	Data collection methods (n=27)	Quantitative (n=15)	"So like I said, all this survey component, like we're able to measure produce fruit vegetable consumption. Not just for the participant, but there's also questions about the household on."

Theme	Subtheme	Category	Representative Quote
		External evaluator (n=5)	"And then we work with an external evaluator to look at those health outcomes."
		Other data collection methods (n=4)	"What we try to do is, and we're doing that, really in part of that, that, that the texting that we're doing, so participants don't really feel as much like they're being surveyed, as much as they're having a conversation about what foods they really enjoy what they're cooking, what they're seeing, maybe going bad in their fridge, that sort of thing."
		Qualitative (n=3)	"I think we will probably add some qualitative interviews and a couple of points along the way, because I think it's really helpful to actually talk with people and hear their experience and what worked and what could have been better. And you know, you just don't get that in a 'how many servings of vegetables did you eat yesterday' [survey]?"
	Barriers (n=19)	Data collection barriers (n=14)	"The biggest challenge has been getting CHW's trained in the hub and in our program. Data collection is a burden. With the [grant name] grant the team will start picking up more of the data collection so that it's not on the CHW. That's been the biggest challenge."
		Lack of evidence (n=5)	"We don't have a real great way of measuring effectiveness right now, we assume that if someone's eating the meals, and when we speak with them, a lot of it is anecdotal, or verbal from the clients saying 'yes, the meals have been helpful', 'I feel better', 'I'm doing better', 'I'm less food insecure'. It's not real solid how we're evaluating effectiveness of that right now, especially for pregnant individuals."
	Results (n=8)	Positive results (n=5)	"...they did show [from the pilot study] cost savings they did and they showed better birth outcomes. And that's you can't ask for more than that. That's exactly right. So I think there is that initial support that this is an effective program. And that it is it will have impact on the community, it will have direct impact on the community, both financially and for the health of the community. So I think those are the big wins."
		No results yet (n=3)	"We're still pretty early and learning and looking forward to seeing these outcomes. But it's been a cool program to be working on so far."
Adoption (n=96)	Outer setting (n=37)	Partnership and connections	"The individuals existed before our new population with, moms with gestational diabetes. The partner came to us and said that 'this has been a priority area. We know and understand the work that you do in terms of helping people manage their chronic disease, is this something that you guys would like to take on?'"
		Financing (n=12)	"With the support of one of the MCOs and our [organization name] applied for [grant name] We got that grant. And then we're able to expand that over, no matter what year we're in. We're going into our third year, and then a government grant."

Theme	Subtheme	Category	Representative Quote
		External pressure (n=5)	"I'm not exactly sure who reached out to who first [partnering organizations], obviously, both parties were interested. We do have someone who's overseeing it on both sides. Both are providers of the medically tailored meal program. Providers like us have been pushing for these programs."
	Individuals (n=28)	Innovation recipients (n=22)	"What motivated us in the beginning is there's definitely a need in the low income population that's pregnant. Some women feel really debilitated. They're feeling really rundown for some period of time. There' many in this population that has some level of food insecurity."
		Personnel roles and characteristics (n=6)	"One of my colleagues, our director of health partnerships brought the concept to the organization and began piloting…."
	Inner setting (n=18)	Compatibility and mission alignment (n=14)	"We started about 32 years ago by providing the services to people with HIV and AIDS at a time when people were literally dying from the disease and in particular malnutrition. The kind of origins of [organization] and most other organizations within the food as medicine coalition, were to provide nutrition as a life-saving service…It gave us an opportunity to build on our expertise and expand our mission to provide these services to people with other life threatening illnesses like cancer, diabetes, renal illness."
		Available resources (n=4)	"[When starting a program] really assess the capacity of the organization and the, the operationalizing of it… Take a step back to really seeing, can we do this? Do we have the staff? Do we have the space? Do we have the capacity to do this kind of a study?.. You have to be a strategic thinker and really assess 'are you able to do that' and maybe it's partnering with other agencies like collaboratively?"
	Innovation (n=13)	Trialability (n=10)	"We started our pilot project in 2016. It was a four week pilot project. In 2017 through 2019, we did a three month pilot project. In 2020, we did a six month pilot project. Since then we've been able to have some continuous funding for projects."
		Innovation evidence base (n=3)	"There is a really big interest in generating more evidence for produce prescription programs, like medically tailored meals have a wealth of evidence behind them. But that's also a population that's like, sick and in need of treatment, essentially."
Implementation (n=343)	Components (n=74)	Redemption mechanism (n=16)	"If they select the farmer's market as the option, they go to the market booth every Saturday or Tuesday, and they sign in. We do not keep their Medicaid number there, but they have a code that we use once they sign in, they get $20 or $24 worth of market money, like fresh RX tokens. They are able to use those to only buy fruits and vegetables."

Theme	Subtheme	Category	Representative Quote
		Groceries (n=15)	"We have an onsite food pharmacy within the diabetes clinic at [hospital]. When individuals come in and screen positive for food insecurity, they are able to meet with their dietitian and their doctor, and they're able to take home groceries that meet their dietary needs as prescribed by their dietician and doctor."
		Produce prescription (n=15)	"We have a template of greens, starches, onion, that the kitchen works from, and the teams that put the bags together use. They know a couple of weeks ahead of time, how many produce bags they are doing and they build that into the produce orders. We were doing 5,000 meals a week, so we're ordering a lot of produce."
		Medically tailored meals (n=13)	"[The meals are] ready to eat or just need reheated because they're frozen. We do one fresh salad and one fresh sandwich kit. For the restaurant frozen entrees we package them in a two or three compartment tray. Kind of like a Lean Cuisine type package."
		Family meals (n=6)	"It was for the family. It wasn't just for the individual participant because we recognize that these women may live in households with other people or have other kids. We didn't want to provide the food for the individual participant, we recognized that we needed to provide food for the family. The meals would serve between four and six people in the household."
		Resources (n=6)	"The CHW [Community Health Worker] does a kitchen checklist with participants and we have up to $100 that we buy kitchen tools, anything they might need, even up to like microwaves and things like that, in order for them to cook the foods that they get."
		Stepwise provisions (n=3)	"We move people to a produce bag, which we also deliver to them weekly, until birth, and then we go back to seven meals a week for everyone in the family postpartum for five weeks."
	Barriers (n=62)	Logistics (n=30)	"Depending upon who the cashier was at the various stores or how their registers work, it wasn't always easy to get an invoice to some of our smaller stores in the villages. Some stores had an old-school receipt per se that said 'two cans of green beans' 'two things of applesauce' were purchased. That would be attached to the voucher and sent to us to then turn around and pay them. They were mailing them to us and there's delays in the mail, and then it's coming to this big hospital and if it wasn't addressed exactly right, it could take a while for that invoice, to make it to the appropriate department for processing."
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		Tailored foods (n=17)	"We work with people that live in single room occupancy hotels, in neighborhoods where there's no full service grocery store, so the amounts have to be smaller. We have the smaller denomination vouchers for them, because they literally have tiny little fridges where they can't put a lot of food in there… That's why you have design this for the people that you're serving."
		Technology (n=11)	"We work with a company that has partnerships with several grocery stores, providers around the country. Not just grocery stores, but also stores like Walgreens, CVS, Dollar General, that also carry food. It's like a debit card, that they can send and it's already set up. It took about four to six months to get everything set up."
		Research protocol (n=11)	"One of [the adaptations] is going to be that from the point at which they are enrolled, we will follow them for 12 months… That means slightly different [than the first study] for tracking purposes and for cohesion. The pilot didn't have a very clear end point and we had a participant that was getting food until their kids were two years old. For the purposes of a study, we have to have a clear endpoint."
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		GusNIP (n=5)	"Our funding source comes from a couple different places. one of them is a GusNIP funded grant."
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	Education (n=36)	Written materials (n=18)	"We do have education handouts that we provide occasionally, specifically for pregnancy and gestational diabetes. Our nutrition intervention is not as intense and it's completely optional to the individuals receiving our meal program, and therefore it doesn't always happen, but it's available if someone needs it or wants it."
		Individualized education (n=7)	"We always work with if there are dieticians, on site, through the medical provider, we work with our dieticians, if there aren't we have our own. Screenings, or any type of guidance that is given through the healthcare provider, that it's seamless with how the food is being provided, and making sure that that food can be immediately referenced, and that the materials that we're offering are one in the language that's appropriate for the individuals."

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		Virtual programming (n=5)	"And in addition to that, with the nutrition education, I don't think we said this earlier, but it is virtual."
	Dose (n=24)	Undefined (n=13)	"But one of the things we learned and this is both related to seasonality of markets, and in [state name] is that when we first started out, we were shooting for 40 weeks, right, a 30 week program. And, but we're like, we could get down to 32 weeks, but then we know, for a lot of markets, that that just doesn't work because the moms may not be become aware of the program until they're farther along. So we have been given the markets the option of doing like 40 weeks or 26 weeks, or even 12 weeks."
		Defined (n=11)	"We signed them up with a project delivery partner to basically get 12 weeks of home delivery."
Maintenance (n=53)	Influential factors (n=35)	Policy (n=10)	"The goal is to have strong enough data at the end of the GusNIP grant or even before that, to get the health plan to cover this population. So that that's our that's our sustainable funding strategy."
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	Future directions (n=18)	Improving provisions (n=12)	"We're actually working on an electronic card to be able to replace those paper vouchers."
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	Inner setting (n=2)	Use financial strategies (n=2)	"But do you know anything about the wrong pocket? Look up [name of white paper] white paper. And it's basically about how if we want to solve social determinants of health, we have to ensure that the resources go to the groups that actually provide the resources, and not just make the referral. Right. And it shouldn't go back into the healthcare system, since that's what's causing a bunch of issues in the first place."
Reach (n=201)	Priority population (n=119)	Pregnant (n=20)	"Pregnancy or postpartum, up to six months postpartum, and then food insecure."
		BIPOC (n=19)	"Certainly, communities of color are primarily, I think we're trying to reach broadly…"
		Chronic disease (n=16)	"But we're just really determined to create access for individuals who are affected by diet related illness, then then we still have criteria, but it's not quite as rigorous."
		Food insecure (n=13)	"They also are predominantly living under the poverty line. I don't know that we're screening for financial, but we are screening for food insecurity. And generally, those are kind of tied together."
		Medicaid (n=11)	"The other great thing about [our program] being tied to Medicaid and not necessarily other benefit programs, is the income qualification for Medicaid, at least in Kentucky, is higher than the qualifications for SNAP and WIC. So, for participants, the beauty of it is that participants who may kind of fall between the cracks of other program requirements, they would still qualify for [our program] with Medicaid insurance."
		Low income (n=9)	"Like less than 10% of our patients are white, they're overwhelmingly low income."
		Underserved (n=7)	"My passion other than reaching out directly, intention being intentional about working with the refugee communities."
		Other (n=7)	"We work with a lot of older adults and people living with HIV and AIDS."
		Urban (n=6)	"So majority, definitely. Urban. Within the, I would say within the city, but we call the city like 20 counties. So within that kind of metro area."
		Location-based (n=6)	"I mean, we're in [county redact] County. So, there's a fair number of LGBTQIA people."
		Rural (n=5)	"And we you know, because most of our members are in rural communities, I mean, we just have this affinity for, for rural Kentucky and wanted to make that make it work for rural communities…"

Theme	Subtheme	Category	Representative Quote
	Recruitment (n=51)	Healthcare system (n=28)	"The health care contract partners are doing are doing screenings for food insecurity and everyone through this flexible services program who gets referred to us screens positive for food insecurity."
		Community health worker (n=13)	"We work directly with the clinic, clinician health care provider, and that can be a navigator, a community health worker."
		Health department (n=7)	"We opened it [our first pilot study] up to any participants, and then they like I said they had to go to the health department or free clinic to sign up."
		Word of mouth (n=3)	"The initial one was definitely word of mouth. I don't recall that we blatantly announced that we were doing this that I can recall."
	Community engagement (n=25)	Patient-centeredness (n=15) Flexibility (n=11) Cultural Awareness (n=4)	"… we want to be really mindful of meeting people where they're at with this program… because we know that if they're engaged in the health care system and have this health worker following them, we're doing everything we can to make sure that they're supported."
		Co-creation (n=6)	"And so going back and then working with people, we already had built relationships with who understood what we were talking about what we were wanting to do, made a big difference."
		Relationship building (n=4)	"Really this strength of all this is dependent upon the community and the commitment and relationships and partnerships at the community level. You know, having community champions is really what makes or breaks it."
	Barriers (n=6)	Participant awareness (n=3)	"We only had a 10% redemption rate [for our first pilot study]. What we also discovered is that very few of them were seeing a doctor pretty regularly… we also needed to work with a demographic that's going to be seeing a doctor regularly enough that we're actually going to be able to capture some data during the program."
		Provider obligation (n=3)	"I just think the turnover is so high right now in the medical field, that it has been challenging for some of our providers to kind of maintain programming in the way that they'd like to."

Theme	Subtheme	Category	Representative Quote
		Social connectedness (n=4)	"[Another outcome] would be just the connection that people have when they participate in these programs to one another, and how much benefit there is for them to for the community and the connection and the relationships, and how much that improves people's health as much as the food."
		Knowledge and awareness (n=3)	"The surveys asked about food security, fruit and vegetable consumption, self-efficacy related to healthy eating. Things like 'I'm able to make a snack through our meals', 'I'm able to eat fruits and vegetables for a snack instead of a packet of pretzels or sweets."
		Other (n=2)	"We're actually taking stool samples to study the gut microbiome, the skin carotenoids [in our kid's program]. So those are all new measurements that are going to be included in this next round of produce prescriptions for catering."
	Data collection methods (n=27)	Quantitative (n=15)	"So like I said, all this survey component, like we're able to measure produce fruit vegetable consumption. Not just for the participant, but there's also questions about the household on."
		External evaluator (n=5)	"And then we work with an external evaluator to look at those health outcomes."
		Other data collection methods (n=4)	"What we try to do is, and we're doing that, really in part of that, that, that the texting that we're doing, so participants don't really feel as much like they're being surveyed, as much as they're having a conversation about what foods they really enjoy what they're cooking, what they're seeing, maybe going bad in their fridge, that sort of thing."
		Qualitative (n=3)	"I think we will probably add some qualitative interviews and a couple of points along the way, because I think it's really helpful to actually talk with people and hear their experience and what worked and what could have been better. And you know, you just don't get that in a 'how many servings of vegetables did you eat yesterday' [survey]?"
	Barriers (n=19)	Data collection barriers (n=14)	"The biggest challenge has been getting CHW's trained in the hub and in our program. Data collection is a burden. With the [grant name] grant the team will start picking up more of the data collection so that it's not on the CHW. That's been the biggest challenge."
		Lack of evidence (n=5)	"We don't have a real great way of measuring effectiveness right now, we assume that if someone's eating the meals, and when we speak with them, a lot of it is anecdotal, or verbal from the clients saying 'yes, the meals have been helpful', 'I feel better', 'I'm doing better', 'I'm less food insecure'. It's not real solid how we're evaluating effectiveness of that right now, especially for pregnant individuals."
	Results (n=8)	Positive results (n=5)	"...they did show [from the pilot study] cost savings they did and they showed better birth outcomes. And that's you can't ask for more than that. That's exactly right. So I think there is that initial support that this is an effective program. And that it is it will have impact on the community, it will have direct impact on the community, both financially and for the health of the community. So I think those are the big wins."

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		No results yet (n=3)	"We're still pretty early and learning and looking forward to seeing these outcomes. But it's been a cool program to be working on so far."
Adoption (n=96)	Outer setting (n=37)	Partnership and connections (n=13)	"The individuals existed before our new population with, moms with gestational diabetes. The partner came to us and said that 'this has been a priority area. We know and understand the work that you do in terms of helping people manage their chronic disease, is this something that you guys would like to take on?'"
		Financing (n=12)	"With the support of one of the MCOs and our [organization name] applied for [grant name] We got that grant. And then we're able to expand that over, no matter what year we're in. We're going into our third year, and then a government grant."
		Policies and laws (n=7)	"Since we have the Medicaid benefit in California now, we're really interested in helping not just for the plan that we're contracted with, but in general across this district to start to demonstrate where we are and how this intervention could be useful across the Medicaid population. That's the reason I got interested."
		External pressure (n=5)	"I'm not exactly sure who reached out to who first [partnering organizations], obviously, both parties were interested. We do have someone who's overseeing it on both sides. Both are providers of the medically tailored meal program. Providers like us have been pushing for these programs."
	Individuals (n=28)	Innovation recipients (n=22)	"What motivated us in the beginning is there's definitely a need in the low income population that's pregnant. Some women feel really debilitated. They're feeling really rundown for some period of time. There' many in this population that has some level of food insecurity."
		Personnel roles and characteristics (n=6)	"One of my colleagues, our director of health partnerships brought the concept to the organization and began piloting…."
	Inner setting (n=18)	Compatibility and mission alignment (n=14)	"We started about 32 years ago by providing the services to people with HIV and AIDS at a time when people were literally dying from the disease and in particular malnutrition. The kind of origins of [organization] and most other organizations within the food as medicine coalition, were to provide nutrition as a life-saving service…It gave us an opportunity to build on our expertise and expand our mission to provide these services to people with other life threatening illnesses like cancer, diabetes, renal illness."
		Available resources (n=4)	"[When starting a program] really assess the capacity of the organization and the, the operationalizing of it… Take a step back to really seeing, can we do this? Do we have the staff? Do we have the space? Do we have the capacity to do this kind of a study?.. You have to be a strategic thinker and really assess 'are you able to do that' and maybe it's partnering with other agencies like collaboratively?"

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	Innovation (n=13)	Trialability (n=10)	"We started our pilot project in 2016. It was a four week pilot project. In 2017 through 2019, we did a three month pilot project. In 2020, we did a six month pilot project. Since then we've been able to have some continuous funding for projects."
		Innovation evidence base (n=3)	"There is a really big interest in generating more evidence for produce prescription programs, like medically tailored meals have a wealth of evidence behind them. But that's also a population that's like, sick and in need of treatment, essentially."
Implementation (n=343)	Components (n=74)	Redemption mechanism (n=16)	"If they select the farmer's market as the option, they go to the market booth every Saturday or Tuesday, and they sign in. We do not keep their Medicaid number there, but they have a code that we use once they sign in, they get $20 or $24 worth of market money, like fresh RX tokens. They are able to use those to only buy fruits and vegetables."
		Groceries (n=15)	"We have an onsite food pharmacy within the diabetes clinic at [hospital]. When individuals come in and screen positive for food insecurity, they are able to meet with their dietitian and their doctor, and they're able to take home groceries that meet their dietary needs as prescribed by their dietician and doctor."
		Produce prescription (n=15)	"We have a template of greens, starches, onion, that the kitchen works from, and the teams that put the bags together use. They know a couple of weeks ahead of time, how many produce bags they are doing and they build that into the produce orders. We were doing 5,000 meals a week, so we're ordering a lot of produce."
		Medically tailored meals (n=13)	"[The meals are] ready to eat or just need reheated because they're frozen. We do one fresh salad and one fresh sandwich kit. For the restaurant frozen entrees we package them in a two or three compartment tray. Kind of like a Lean Cuisine type package."
		Family meals (n=6)	"It was for the family. It wasn't just for the individual participant because we recognize that these women may live in households with other people or have other kids. We didn't want to provide the food for the individual participant, we recognized that we needed to provide food for the family. The meals would serve between four and six people in the household."
		Resources (n=6)	"The CHW [Community Health Worker] does a kitchen checklist with participants and we have up to $100 that we buy kitchen tools, anything they might need, even up to like microwaves and things like that, in order for them to cook the foods that they get."
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Appendix E: Representative Quotes from Support System Interviews

Note: Numbers in parenthesis represent the number of meaning units (words, phrases, or sentences that contain related content relaying a specific thought or idea) for each category, subtheme, and theme. Quotes are presented verbatim to retain the participants' authentic voices.

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Reach (n=177)	Priority population (n=90)	BIPOC (n=13)	"We very much tried to have our programming highlight, you know, the needs and communities of color"
		Pregnant (n=12)	"We are starting to look specifically in one of our states as a pilot for a food as medicine targeted solely to pregnant women."
		Location-based (n=12)	"And so, I will also note, this program that we're doing is actually open to the community. So, it's not just [insurance provider] members."
		Medicaid (n=10)	"Medicaid fits pregnant women quite well, right. So that includes pregnant women. So that's part of our, you know, our focal area."
		Low income (n=10)	"Because the program is designed to serve people receiving SNAP it already, obviously is designed to serve low-income populations."
		Rural (n=7)	"And [we've done work in] specifically in rural areas."
		Food insecure (n=6)	"Priority population is food insecure populations, who are experiencing health conditions."
		Chronic disease (n=6)	"In the studies, we were trying to figure out which disease categories, so we recruited people from our hospitals who had a variety of conditions. So, cancer was one of them. Kidney disease, chronic heart failure, diabetes, malnutrition, cirrhosis, and COPD. Were the disease categories that we picked for the product that was from meals for the produce prescription study, we picked diabetics intentionally."
		Other (n=6)	"[We serve a lot of folks who are] disabled, you know, and just otherwise vulnerable."
		Underserved (n=5)	"We are devoted to those with public insurance. So we don't do commercial because our mission is about improving the quality of care for the underserved and those with public insurance."
		Immigrants (n=3)	"Sometimes they're [program participants] undocumented."

Theme	Subtheme	Category	Representative Quote
	Community engagement (n=46)	Patient-centeredness (n=20) Flexibility (n=17) Cultural awareness (n=3)	"Yes, I would say, when we're putting programs together. It's important to consider, from an inclusion perspective, it's important to consider the education level of who's receiving our information."
		Relationship building (n=13)	"Find your darn community partners, like who are already doing this? Who is already doing this and doing it maybe pretty good, even if they're not perfect. Who in your community is already doing work around this? And send somebody their way? ...finding community partners and finding ways to it almost in a philanthropic space, like send money to fund the program If you're already probably dealing with the people you want them to serve."
		Co-creation (n=13)	"Low income communities are sort of our sort of directing this work and sort of are using their power and voice to influence what's happening in their communities around food as medicine. So just an example of some things that we we've been up to, and that we are, at least in the very near future are pushing forward."
	Barriers (n=29)	Participant awareness (n=13)	"The reality is it is a lot of people do not know that this program exists. And they almost think it's like too good to be true. So they're hesitant to go and take advantage of it. Because you wouldn't want to get into this situation where you thought you were gonna get $20 of free money, but you do you didn't. So that I think this is a big challenge is trying to figure out how do you raise awareness within the food."
		Provider obligation (n=9)	"Including nutrition education within patient care, there are a couple of things we get they're already way overworked overburdened and everybody is asking them to add just add in this question or just add in this one thing. It's like you know what they're way overbooked for that 10- or 15-minute appointments they have anyway."
		Electronic health system integration (n=4)	"We don't have produce prescriptions in our workflow yet. So, I don't know how that would play out. Because that would not be necessarily based on discharge from the hospital or based on any kind of encounter. This hasn't been implemented yet. But you could be just diabetic without having to have an encounter of some sort. And so then how would they be? We don't know right now. We're outreaching from disease state to the research team, but that's not the workflow of when it's really implemented."
		Organizational integration (n=3)	"So I think the goal is to get that into more hands. But yeah, I think that's the biggest issue is just how to do that in a way that from our standpoint, we'd love to just give it to everyone, but we're also working with an organization that has their own priorities and needs and they're working... their resources went into this too. So we were mainly the content behind it, but we can't control as much the end product, right."

Theme	Subtheme	Category	Representative Quote
	Recruitment (n=12)	Healthcare system (n=9)	"There's a trigger in their hospital discharge, if it's medically tailored meals. And then they're referred to the program. If there's a certain chronic condition, and they've been hospitalized, it's part of the discharge."
		Word of mouth (n=3)	"A lot of the ways that the word people know about it, probably the number one way and we've seen this, even in some of our national level work is word of mouth. People know because they know somebody who know."
Effectiveness	Outcomes (n=140)	Return on investment (n=28)	"We look at the health end, they'll tell us about complications. They look at NICU rates of utilization, they look at total cost of care, and that includes length of stay in the hospital. Typically, there's a longer length of stay with a C-section than an uncomplicated birth, for example."
		Nutrition patterns and practices (n=27)	"We've looked at food security, diet quality, confidence and self-efficacy and fruit and vegetable consumption, preparation. Those are more for a select group of people, not for everybody in the program."
		Chronic disease indicators (n=21)	"We can see what has happened to the health of our communities, the rates of obesity, and diabetes and being able to make that link to what people are consuming while they're pregnant."
		Program utilization (n=16)	"[We measure] the number of times a consumer is a repeat user of the program, accessing incentives more regularly, as well as the dollar amount of SNAP and incentive benefits that they're getting."
		Acceptability (n=16)	"We can ask patients about their satisfaction with the healthcare provider, we can also go to their healthcare provider surveys, and link the results of the healthcare provider surveys with the ones the patients who enrolled and compare them against patients who didn't enroll…We hope to identify ways that this particular program helps with the patient experience in this particular period of pregnancy and several months after birth."
		Birth outcomes (n=13)	"If you have someone who is pregnant and has diabetes, then part of that metric is going to be hemoglobin A1C level, in addition to the route of delivery, and the birth weight. If possible, Apgar [score]… A big part of this would be looking at weight gain during the pregnancy, or at birth weight and route of delivery. It would be important to make sure we can do this by looking at our claims data."
		Provider- patient relationships (n=7)	"If your general medicine doctor is supporting a change or somebody you have a relationship with and you trust, even though you're meeting them for the first time, because you're planning pregnancy, like in six months, but we're on the same page, that's going to be much better in terms of acceptance."

Theme	Subtheme	Category	Representative Quote
		Number of participants (n=5)	"They're actually in the midst of planning to roll out a cohort of 1000 patients at [healthcare site] who are pregnant."
		Knowledge and awareness (n=4)	"[We are looking at] behavior change post surveys. 'Is the mom more comfortable cooking'? 'Is she more comfortable shopping'? 'Especially shopping on a budget'? 'Is that part of what's covered through [Educational curriculum]? Those are the main components for this one."
		Mental health (n=3)	"Much mental health is a key piece of our, our HEDIS [Healthcare Effectiveness Data and Information Set] measure and our quality measures."
	Barriers (n=40)	Lack of evidence (n=29)	"[There are] deeper questions around how long should a program last for us to see effectiveness, having to do with cost? What does the healthcare system have to invest in terms of time for a program like this, they want to know about duration, and they want to know about dose, how much money needs to be on this incentive program for a patient."
		Data collection challenges (n=11)	"We were also then interested in trying to quantify the health care cost savings. But we're learning that that's actually very difficult to do because nobody really knows how much things cost, so we're discussing with several other groups, including [names] and others on what's the best way to estimate cost savings? We don't know."
	Data collection methods (n=27)	Quantitative (n=12)	"We do an assessment; they have a parent survey. So there's all kinds of surveys, they're doing a 24 hour recall surveys."
		External evaluator (n=9)	"We've worked with an outside evaluator who just helped us develop metrics."
		Qualitative (n=6)	"Always a qualitative component where you want to hear from the members from those who participated, you know, what worked for you what didn't work for you."
	Results (n=13)	Positive results (n=8)	"We're seeing some more clarity about which health outcomes where we saw strong promise with the reduction of HbA1c [hemoglobin A1c] on consistent use of produce prescriptions over six months."
		No results yet (n=5)	"If we're not successful, that's also important to know what didn't work. It's not always like we come up with a hypothesis, and it's not right, it doesn't work. That's learning too. So that, to me, would be a learning and an understanding, and how do we like, change the program? How do we adapt it?"

Theme	Subtheme	Category	Representative Quote
Adoption (n=178)	Outer setting (n=82)	Policies and laws (n=34)	"Secondarily, there's a lot of policy alignment, when it comes to policies that can further integrate these restrictions into standard health care practice, for one, women, pregnancy is a trigger to get into Medicaid for a lot of women. And since it's Medicaid's policy, then we think that there's an alignment for quality movement. So, we decided to invest there for that reason."
		Financing (n=18)	"The current funding program uses CCL [Community-Clinical Linkages] is one of the strategy areas. So REACH [Racial and Ethnic Approaches to Community Health cooperative agreement] is awarded to organizations that are working in communities where there are health disparities that are related to race, ethnicity. So, they're pretty local projects, and yet I'm not aware of any that are focused on pregnant women per se."
		Partnership and connections (n=16)	"[Partner], which I mentioned is one of our upcoming hubs is a good example. We did a nutrition consortium with them. In 2019, and they said, 'Yeah, this is great. We already have a Blue Zones project in the community. There's some interest in nutrition, but we're not really diving into it very much, let's keep talking and see what else we could do.'"
		External pressure (n=14)	"Without missing a beat, people told us that we should pay attention to medically tailored meals, and to produce descriptions. And not just for medically tailored meals, not just implementing the intervention, but also in building the science around what works and under what conditions."
	Individuals (n=39)	Innovation recipients (n=29)	"New stats have come out that [state] is really low in rankings for maternal health outcomes. We want to address this. So we might start with understanding an overall need or a negative statistic that we'd like to impact and we'd like to have a positive impact on and start there, and then look at it and say, 'Okay, well, let's get more specific. There are a lot of reasons that maternal health outcomes could be poor. What specifically do we want to address? Is there a specific geography?'"
		Personnel roles and characteristics (n=10)	I came in a year ago, and that's when I took the leadership over the task force and [funding agency] funding ended this past June... And why I took this job to lead the task force is that after working 12 years for the city of [city name], and working on food access and food deserts, and then change terminology to healthy food priority areas, and food apartheid, and then I read the COVID-19 nutrition security response for the city of [city name], after looking and working in his field for a long time, food access is not enough."
	Inner setting (n=34)	Compatibility and mission alignment (n=34)	"We do have programs for maternal health and have done some work with gestational diabetes and programs where, in order to be eligible, you would be pregnant, and then also diagnosed as having gestational diabetes and food insecure... And at heart, we are a food and logistics business with a social mission."

Theme	Subtheme	Category	Representative Quote
	Innovation (n=23)	Trialability (n=14)	"They started off with a small pilot in [city name] with one store and one clinic as sort of a proof of concept to show that the technology was possible to make it happen. And then from that, they were able to scale up further."
		Innovation evidence base (n=9)	"The evidence hadn't been built, specifically, while the evidence was even more sparse for produce prescriptions than for medically tailored meals. But both were pretty limited in the actual intervention. And by that, I mean, which target populations, which disease categories, what duration, do you feed the family or just the patient? Like those kinds of questions have not been answered. So as we were thinking about testing those, we were thinking about informing the actual implementation of them."
Implementation (n=229)	Components (n=44)	Groceries (n=12)	"[Program name] were already developing it and we helped get some grant funding that just grew it to a little bit larger. [They] also did during the pandemic they did some like emergency food, boxes or emergency food, getting the food out to people to kind of get a better feel of what the deed was in their community."
		Family meals (n=9)	"We also provide meals to any household members as well, because our reasoning behind that is the person has had a medical situation where they need to recover, then and they are also have caregiving responsibilities, it would be difficult for them to manage the hurdles."
		Resources (n=9)	"So they [program name] also receive home visits, like I said with a food delivery, but they receive comprehensive case management or community health worker will work with them directly. And then they are provided other educational opportunities through workshops within the counties that they wherever they live."
		Redemption mechanisms (n=6)	"It depends where that where they go, they may, you know, they may get a voucher, they may get a coupon, you know, if it's at a retail site, or it's automated in the POS system, it may print off a coupon at the bottom for $5 off your next purchase. It may be an automatic discount, so you, you know, buy instead of 50% off. So those, the markets tend to be token only models"
		Medically tailored meals (n=5)	"The medical tailored meals, they are people who were recently discharged from the hospital, and those meals were sent to their home. Okay, for the study, those produce boxes are also sent to people or patients' homes"
		Stepwise provisions (n=3)	"Because we can switch them one time. So they might start on groceries. But then maybe once they're getting closer to baby's delivery, they might say, actually put me on the prepared meals or vice versa. So we can even if they start with one, we can switch them one time to the other component that will work better for their family dynamic."

Theme	Subtheme	Category	Representative Quote
	Education (n=39)	Written materials (n=20)	“Little recipe cards and little brochures, and then always offer as part of the intake, they do a brief nutrition counseling session.”
		Group classes (n=9)	“One of the hubs in January they're starting it's a cooking class.”
		Virtual programming (n=7)	“We have a lot of online recipes. So they can go in and really choose what sounds good to them. And really learn how to use the food that we're providing to really supplement their health care and their lifestyle and really learn what works for them and what doesn't.”
		Individualized education (n=3)	“We have some nutrition education that is offered to the patient as an option. But it's not content. It's not conditional. So there are programs out there and I think ultimately, there's been some where we're showing up to the education as a condition to like receive your next set of vouchers. That is not the case here. It'll be offered to them, but it will still give them the pantry even if they don't utilize the nutrition education options”
	Adaptation (n=34)	Tailored foods (n=14)	“With our menus, a big part of our model is choice. We want to make sure that people have the dignity and autonomy in selecting the foods that they’re eating, it’s not just based on their dietary needs and allergens, but their preferences and cultural needs and desires as well.”
		Technology (n=13)	“So utilizing carded solutions, where instead of having like a paper voucher, it’s an actual card that looks like any other credit card reduces stigma. So it encourages people to utilize it more because in [the] store it looks like any other form of payment…And then usually, carded solutions can be used more widely… but it’s only for fruits and vegetables, then that’s going to be much more widely redeemed, that one that paper voucher for your local farmers market, for example.”
		Distribution model (n=7)	That [program] is a food delivery service to pregnant moms. They are doing this in general with the population with pregnant moms in [region]. So they will identify food insecurity with a pregnant mom and provide food boxes, to deliver them to the members home or the community members home.”
	Partner organizations (n=34)	Healthcare systems (n=18)	“They have also worked with another group out in [county] and [healthcare partner]. So the [partner], which is a healthcare organization, are working together with me [at the foundation].”
		Other community agencies (n=6)	“We have established various sorts of projects, to kind of have a spectrum of like, let's just find some projects to work together to towards the other end is developing a community-based hub that is part of the nutrition organ campaign. And within those hubs, there will be a dedicated community liaison that works directly with us that we help support part of their time.”

Theme	Subtheme	Category	Representative Quote
		Food retailers (n=6) Retailer (n=4) Food bank (n=2)	"I mean, that's the beauty of working with anywhere from seven to 21 different food banks."
		Food distributor (n=4)	"But then we also kind of going back to that listening to those true experts in the community. So, we worked with shear strength and the East Kentucky Dream Center, which is our actual food delivery partner. And they were able to help connect to other services in the area. So we found out, which we already knew, but were familiar with or were able to get connected with the hands program, which is run through the Health Department."
	Barriers (n=29)	Logistics (n=13)	"I will say it's [doing premade boxes] a little bit challenging operationally, because food banking is a weird, weird operation, and that you never really know what your supply is going to be at any particular moment in time. Because you rely heavily on donations, right? And you don't really ever know what your demand is going to be. So you don't want to pre load boxes with fresh produce way ahead of time. Right. Or, you know what I mean? So that it's, that's kind of a funny thing. So the boxes have been a little bit challenging."
		Funding (n=12)	"It's just extremely difficult to obtain funding. And, you know, sometimes you can get a starter grant, but it's usually not robust enough to do research, enough where people can say, we agree that the results are actually there."
		Scale-up (n=4)	"So part of our challenge, which may not be the same for every other healthcare system, but or healthcare, but we are super large. But we were trying to find a scalable vendor. And that's a challenge."
	Duration	Undefined (n=17)	"So typically, it's going to be about 14 or 21 meals a week, sometimes it might be 10 meals a week, again, depending on the program. But typically, we deliver weekly, in a few of our programs to pregnant people, let's say it's a 14, like a one meal a day program, we would deliver one cooler of 14 meals every other week. We can deliver every other week too."
		Defined (n=8)	"I'm using air quotes here a deposit to their produce gift card of $240 every 90 days and in the program for one year. And then their physician can decide if they will be renewed for up to a second year."
	Cost (n=24)	Foundation (n=9)	"I think you've got a number of larger funders like [funder], and others that are, that are making big, big investments in terms of the field."
		Health insurance (n=7)	"So it was a relatively seamless process [recruiting with research staff], where we have medically tailored meals playing out and the 1115 [waivers]. The supplemental benefits, I would say it's not super smooth yet. I mean, it's new, and it's new across healthcare. So I'm guessing that's the same everywhere, but you have to get a referral. And then it has to be submitted in the claims."

Theme	Subtheme	Category	Representative Quote
		Government grant (n=5)	"[State], where we did the prescription program, we were able to get the state… to actually [state] was the first state as far as I know, in the country, that state funded and incentive program. So we took the results from the study that we did at the FQHC and we're able to work with a local poverty rights activist group. And in 2013, the state of [state] I think it was for half a million dollars funded the statewide nutrition incentive program."
		GusNIP (n=3)	"I got pulled into this space because of an opportunity that a community-based organization had. And so they basically had gotten funding from this GusNIP grant to basically do a produce prescription program."
Maintenance (n=75)	Influential factors (n=57)	Policy (n=22)	Getting policymakers to be willing to pay for dietitians, because different states, it varies, right, Medicaid coverage varies from state to state, and so much of this meant of medically tailored meals, and on the on a dietitian, so if I, if I'm working in a state and Medicaid doesn't cover the dietitian, then now sustainability hinges on this MCO on us to be in this market forever, to be able to pay for this forever. And it may limit our ability for expansion, because we're covering absolutely everything, as opposed to policymakers realizing the benefit and covering dieticians."
		Funding (n=19)	"I think that would be primarily the conversations we're seeing is that we can get those pilot programs where we can get one year, and then how do we get the second how do we really plan for something with a long-term goal when you have those short-term funding pieces."
		Intervention evidence (n=13)	"If the recipients are doing their own small studies, we very much encourage them to write up whatever they have, that's publishable whether it's, you know, peer reviewed publications or reports. We try and keep a catalogue of success stories."
		Partnerships (n=3)	"Where we can get multiple partners on board to look and have that mutually beneficial piece long term so that we can get more funding."
	Future directions (n=18)	Expanding education (n=9)	"Even if you can get the education out there, we know that there has to be a very holistic approach to this from the standpoint of and I think this is true of anyone education is a step in the right direction."
		Improving provisions (n=9)	"The next hurdle and the hope is that and what we hope to do with this [program name] program, is when patients enroll, they can say at that point, I would like a card that works at this store, I would or I would like a home delivery of a let's call it a CSA box, or I would like a farmers market voucher giving the patient some options."

Theme	Subtheme	Category	Representative Quote
Implementation strategies (n=152)	Inner setting (n=51)	Use financial strategies (n=41)	"I can tell you in 2021, we gave a total of about $9 million in charitable giving through our nonprofit, the [nonprofit]. And when you see a lot of that then breaks out across different categories. So we give donations like I said, we're in 20 states."
		Change infrastructure (n=10)	"And many times there'll be indicators on the shelf. [In] green, yellow, and red. Green is like disagree, disagree, food, eat it as much as you want. Yellow, this is something you want to eat sparingly and red is like, this is a treat or only on occasion."
	Individuals (n=48)	Support delivery agents (n=29)	"I would say that there's a lot of good knowledge sharing and translation happening. And we don't have to start from scratch. A little bit of research will uncover a lot of this information. So for instance, the [organization] I mentioned on mainstreaming produce prescriptions is an important resource and toolkit for any group that is considering implementing this intervention… looking at different types of produce prescription models, or medically tailored meals models that have been successful and how they've been successful."
		Engage priority populations (n=12)	"But I think there's a great need to just just like, back in the 80s drug companies started going around providers to get information instead direct to consumer marketing. I think we need to do something similar for women of reproductive age to get the message out there."
		Provide interactive assistance (n=7)	"But if someone asked the question, 'how do you do food as medicine?' Then usually, I would get on a call with them and say, okay, like, let's walk through what you're looking to do, what do you know about in your area? What are the needs in your, you know, your geography and in your community, and then go from there on."
	Outer setting (n=41)	Develop partner relationships (n=35)	"We tend to talk more about the process like, building a coalition whether there are policy changes that are needed rather than the purely operational for the for this area."
		Train and educate partners (n=6)	"And they have an educational component where they've actually trained the clinic staff on how to talk about incorporating fresh, frozen and sometimes canned produce into your diet."
	Process (n=13)	Adapt and tailor (n=9)	"I think in terms of the program that I've worked to develop; it was already kind of a program in existence with [organization]. So we took the core of that and then kind of mapped that up against some of our quality and measurement items that we needed to perform at a certain level with and then just kind of merge the two together, if you will, or at least took enough of what we needed to impact and combined it with their core program."
		Evaluate and iterate (n=4)	"I think it can be really overwhelming to think of what is the exact right solution. So don't let don't let perfect get in the way of progress. You know, you're gonna make mistakes… You know, you can make mistakes and learn from it and still be doing good things and still be bringing about positive change."