

Healthy
Eating
Research



Summer Speaker Series for Students 2025

(The contents and findings of this presentation are those of the speakers and do not represent the official views of the Centers for Disease Control & Prevention or Department of Health and Human Services.)

Getting Started!

- Update your name on Zoom, if needed
 - *Right click on your Zoom box, click “rename”*
- Type your name and institution into the chat box!
 - *Question: Which best describes you?*
 - *Ex. Undergraduate Student, Dietetic Intern, Masters Student, Doctoral Student, Post Doc, Public Health Practitioner, Researcher/Professor, Other*
- Remember to keep yourself on mute.
- Type your questions into the chat box.

NOPREN HER Summer Series for Students

- Explore various public health topics related to:
 - Food and nutrition security
 - Federal, state, and local policy
 - Strategies to support young children's health
 - ***And more!***
- This series is a collaborative effort of Healthy Eating Research (HER) and Nutrition and Obesity Policy Research and Evaluation Network (NOPREN).

NOPREN HER Summer Series for Students

Schedule and Topics

- June 11: Policy, Systems, and Environmental (PSE) Strategies to Support Young Children's Diet and Health
- June 25: Federal, State, and Local Nutrition Policy Updates
- July 9: Food Policies in Schools
- July 23: Building Resilient Food Systems
- ***August 6: Interventions to Improve Food and Nutrition Security***
- August 13: Student Presentations

The series will take place on
Wednesdays **from**
4:00 - 5:00 pm EST

For more information or to watch past recordings, visit:

<https://nopren.ucsf.edu/her-nopren-summer%C2%A0speaker-series-students-2025>

**Healthy
Eating
Research**



Session 5: Interventions to Improve Food and Nutrition Security

Food is Medicine: What Do We Know? Where Are We Going?

Hilary Seligman MD MAS

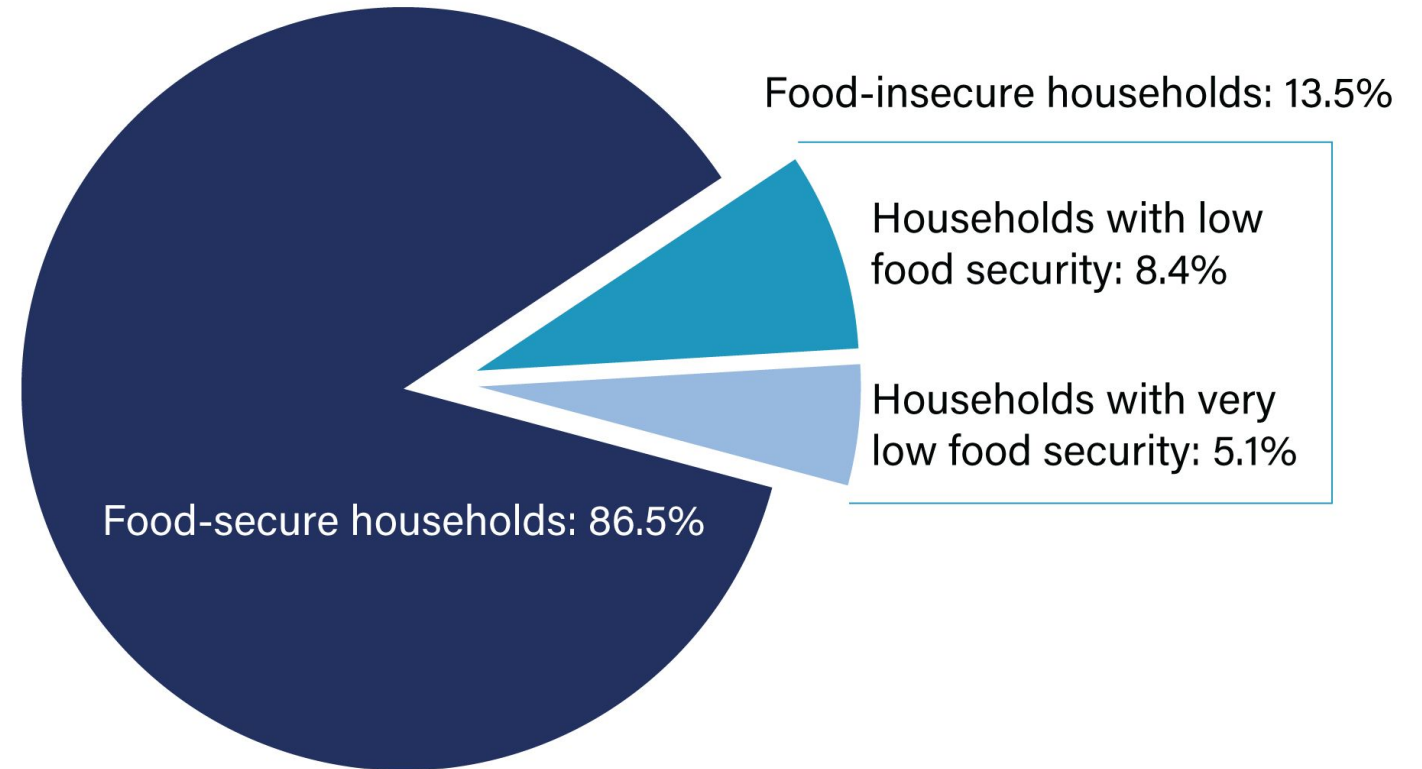
Professor of Medicine and of Epidemiology & Biostatistics, UCSF
UCSF Center for Vulnerable Populations



Action Research Center
for Health Equity
Department of Medicine

1 in 7 US Households Food Insecure in 2023

U.S. households by food security status, 2023

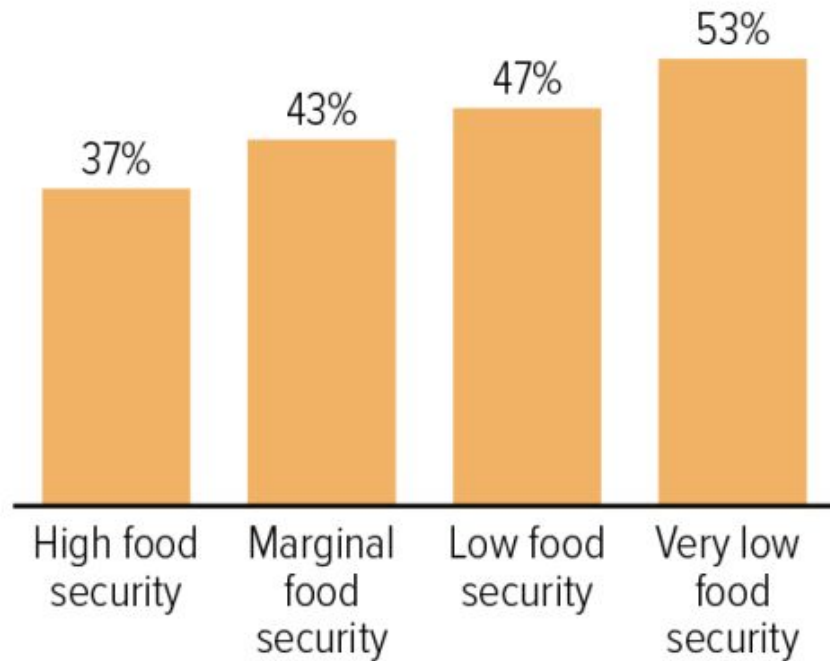


Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census, 2023 Current Population Survey Food Security Supplement data.

FIGURE 1

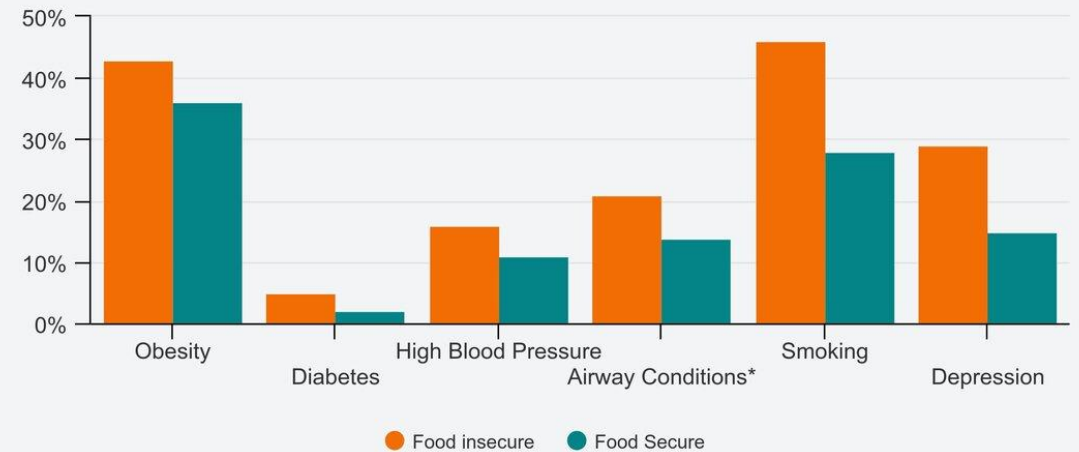
Adults in Households with Less Food Security Are Likelier to Have a Chronic Illness

Probability of any chronic illness



Source: Christian A. Gregory and Alisha Coleman-Jensen, "Food Insecurity, Chronic Disease, and Health Among Working-Age Adults," U.S. Department of Agriculture, July 2017. Adjusted for differences in demographic, socioeconomic and other characteristics. Sample includes working-age adults in households at or below 200% of the federal poverty level.

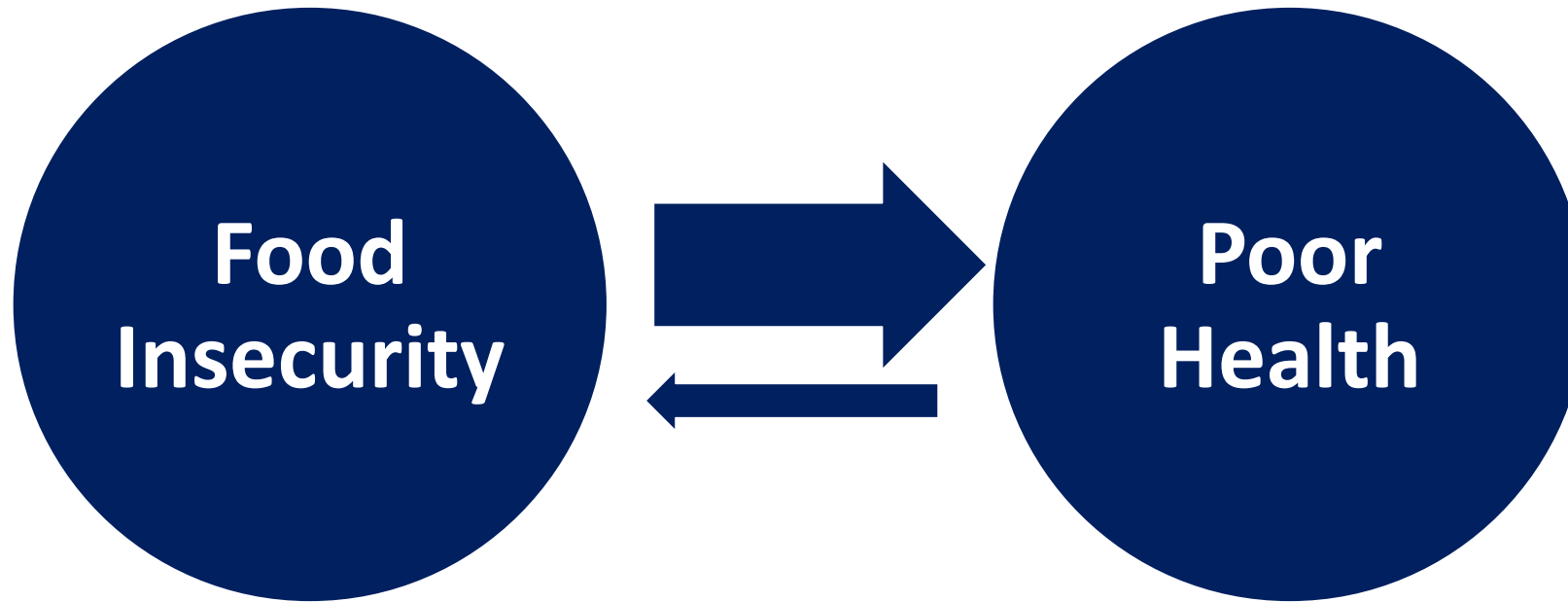
Chronic Conditions of Food-Secure Vs. Food-Insecure Young Adults



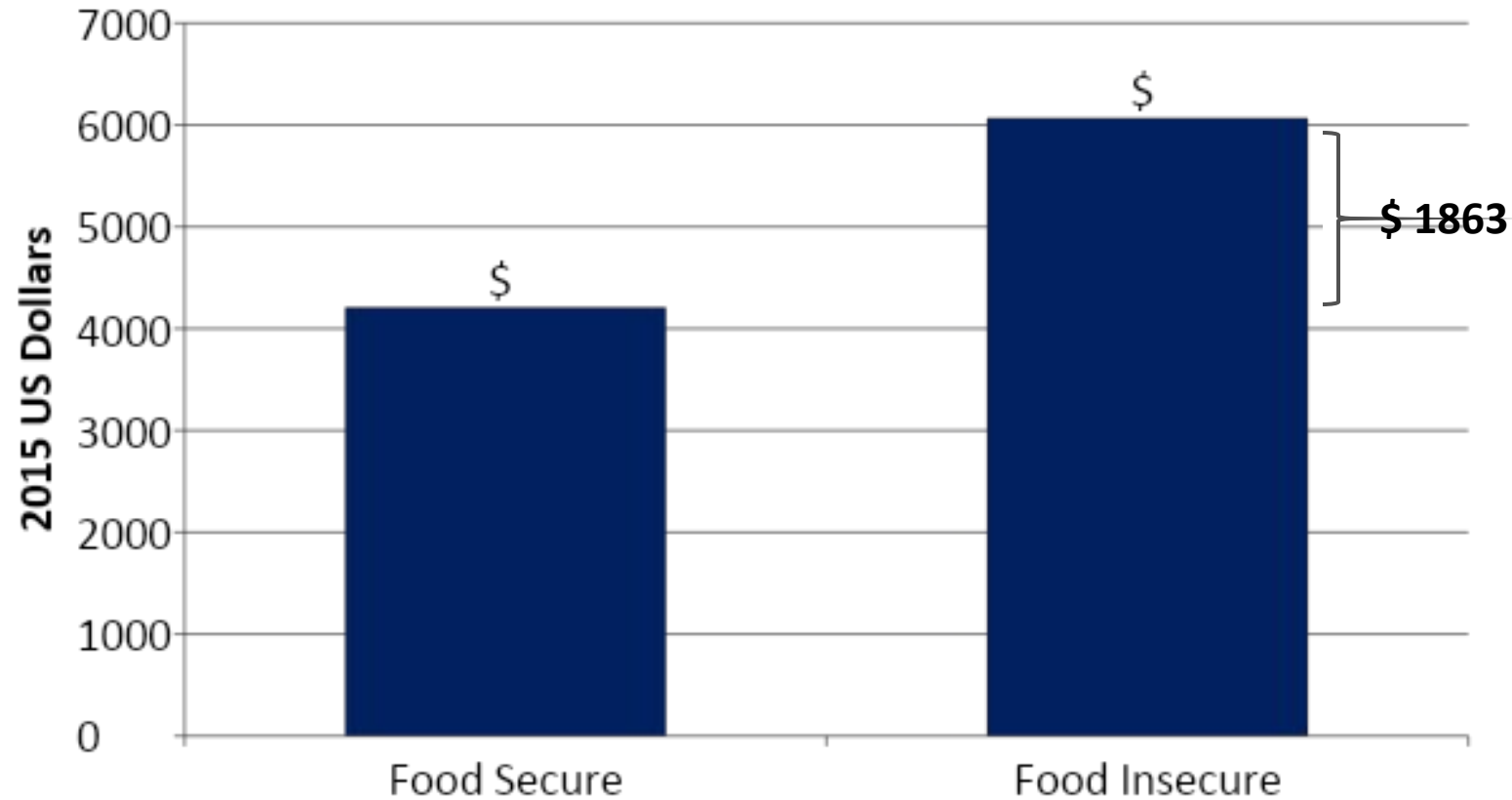
*asthma, chronic bronchitis, emphysema

Source: Food Insecurity and Chronic Disease in U.S. Young Adults: Findings from the National Longitudinal Study of Adolescent to Adult Health, JGIM. Food Insecurity is Associated with Poorer Mental Health and Sleep Outcomes in Young Adults, JAH.

Food insecurity and poor health



Food Insecurity & Subsequent Annual Health Care Expenditures



NHIS-MEPS data adjusted for: age, age squared, gender, race/ethnicity, education, income, rural residence, and insurance.



**\$77.5
billion**

**additional health care
expenditures annually**

Mis-Alignment Between Health Care & “Social Care” in the US

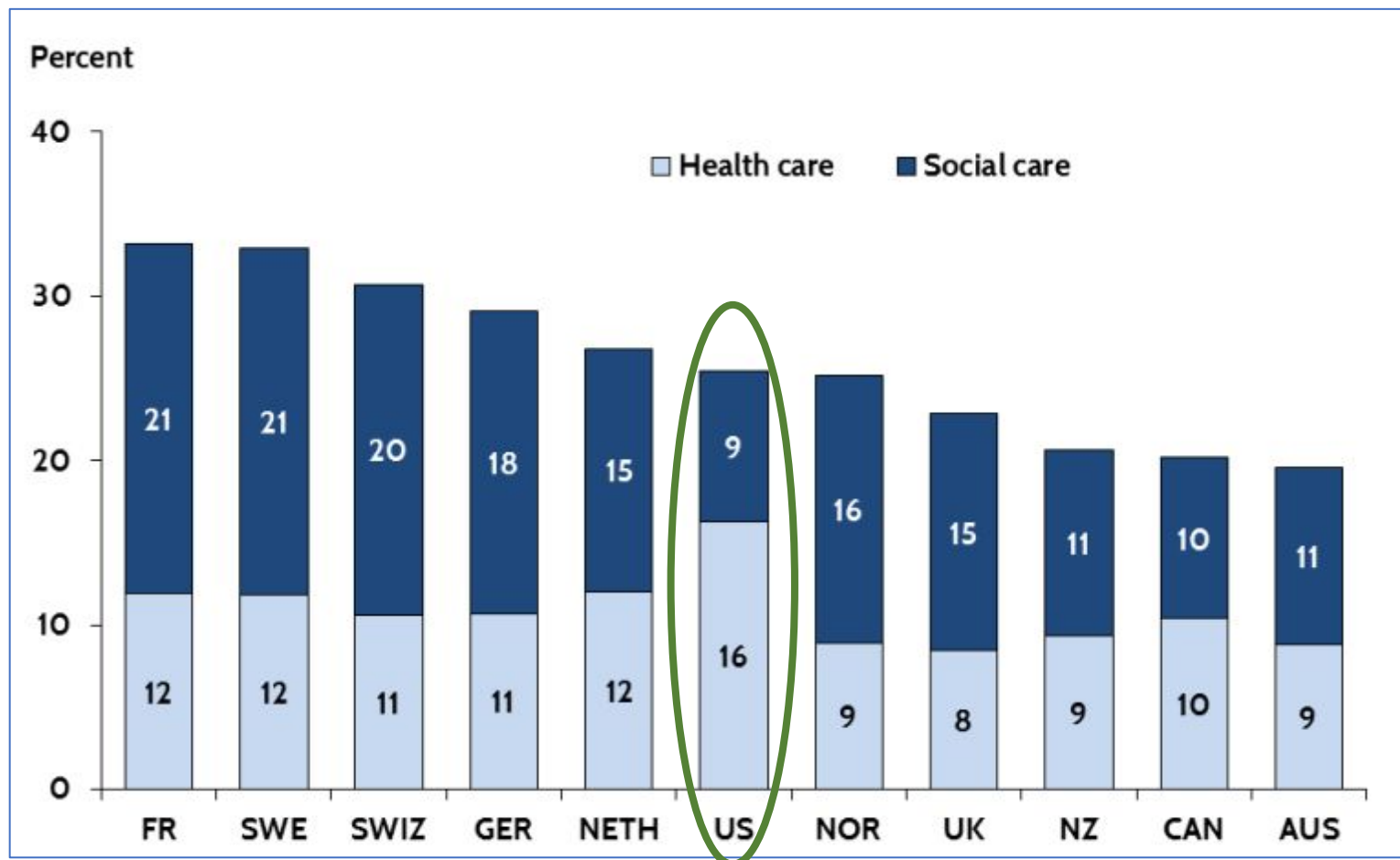


Figure 1. Health and Social Care Spending as a Percentage of GDP

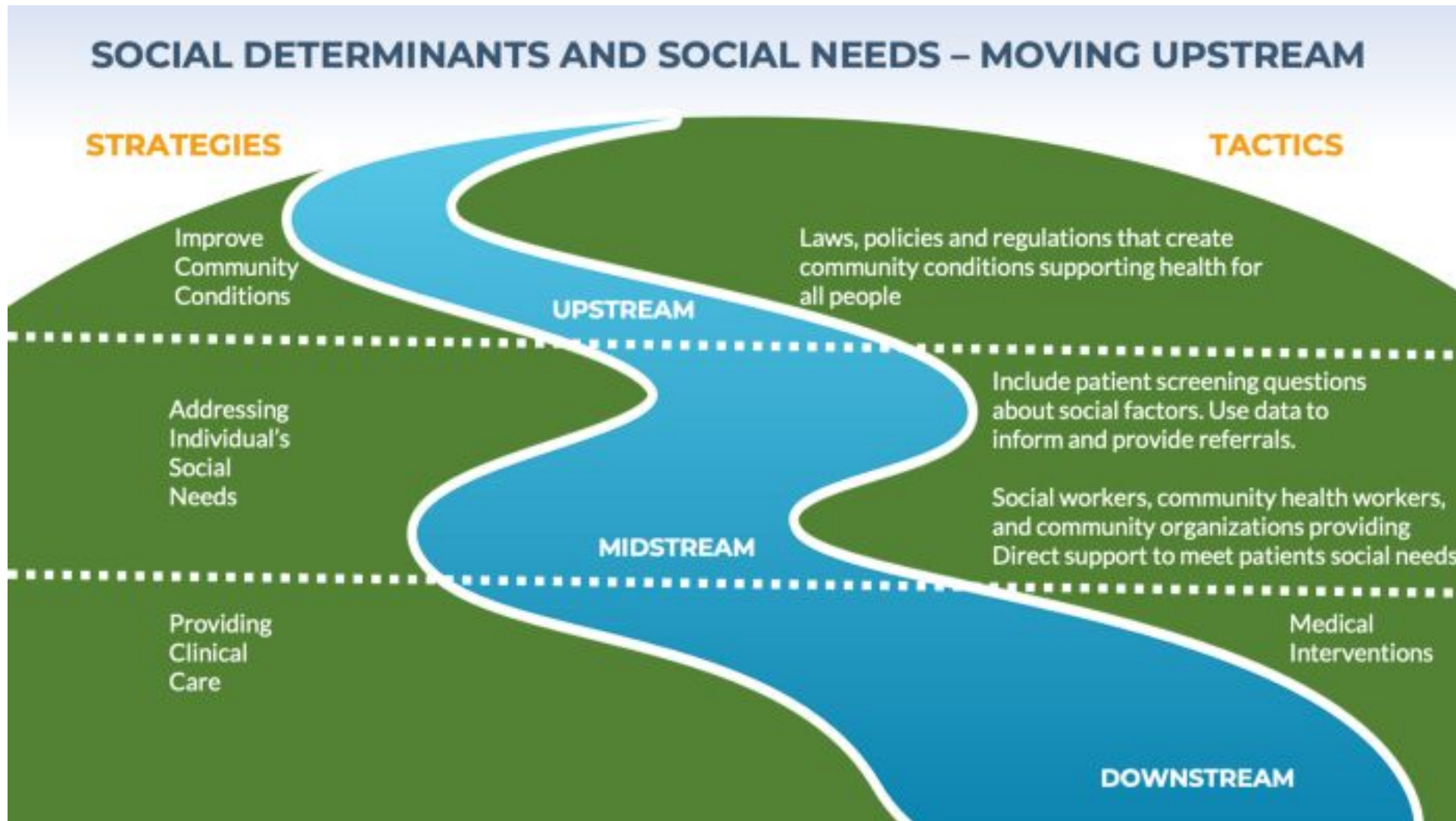
Rebalancing Social & Medical Spending to Promote Health. Butler et al. Brookings Institution. 2017

These is the downstream impact of policies we have put into place.



<https://www.cdc.gov/public-health-gateway/php/about/social-determinants-of-health.html>

Accessed 8/1/2025.



Social Drivers of Health

Social Needs

“Meeting Individual Social Needs Falls Short Of Addressing Social Determinants Of Health,” Health Affairs Blog, January 16, 2019. DOI: [10.1377/hblog20190115.234942](https://doi.org/10.1377/hblog20190115.234942)

Nutrition Security vs Food Security (simplified)

WHAT IS NUTRITION SECURITY?

Consistent access to nutritious foods that promote optimal health and well-being for all Americans, throughout all stages of life.



HOW DOES NUTRITION SECURITY BUILD ON FOOD SECURITY?

Food security is having **enough** calories.
Nutrition security is having the **right** calories.

<https://www.fns.usda.gov/resource/usda-actions-nutrition-security>

Note that this citation is provided for historical reference and is no longer active. This graphic does not represent the official position of USDA.



- Integration of specific food and nutrition interventions in, or in close collaboration with, the health care system
- Target population
 - People with or at high risk for certain health conditions (often diet-related)
 - People with or at high risk of food insecurity

Largest FIM Program



WIC: BUILDING A HEALTHY FOUNDATION



What is WIC?

The Special Supplemental Nutrition Program for Women, Infants, and Children – also known as WIC – supports maternal and child health by providing nutritious supplemental foods, nutrition education, breastfeeding promotion and support, and referrals to important health care and other social services.



Healthy foods



Nutrition education



Breastfeeding support



Referrals

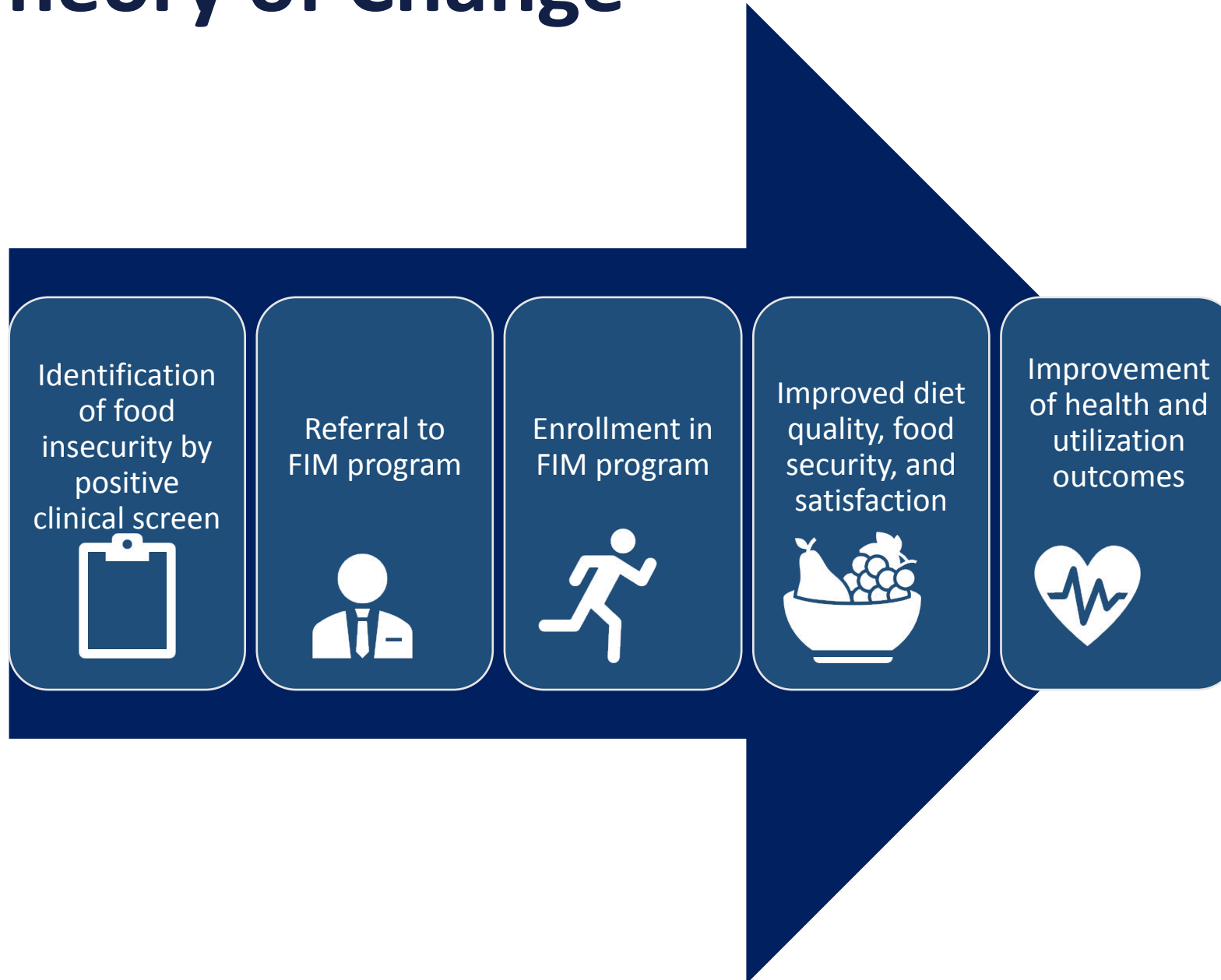
Can FIM programs be scaled?

PROVEN

Can FIM programs impact short and long term health outcomes?

PROVEN

Theory of Change



- Data transfer between sectors (health care, CBO, & food vendor)
- Data tracking within the electronic health record
- CBO capacity to provide food how, when, where and at the price that healthcare desires
- Fragmentation of the ecosystem outside of healthcare


Spectrum of FIM Programs

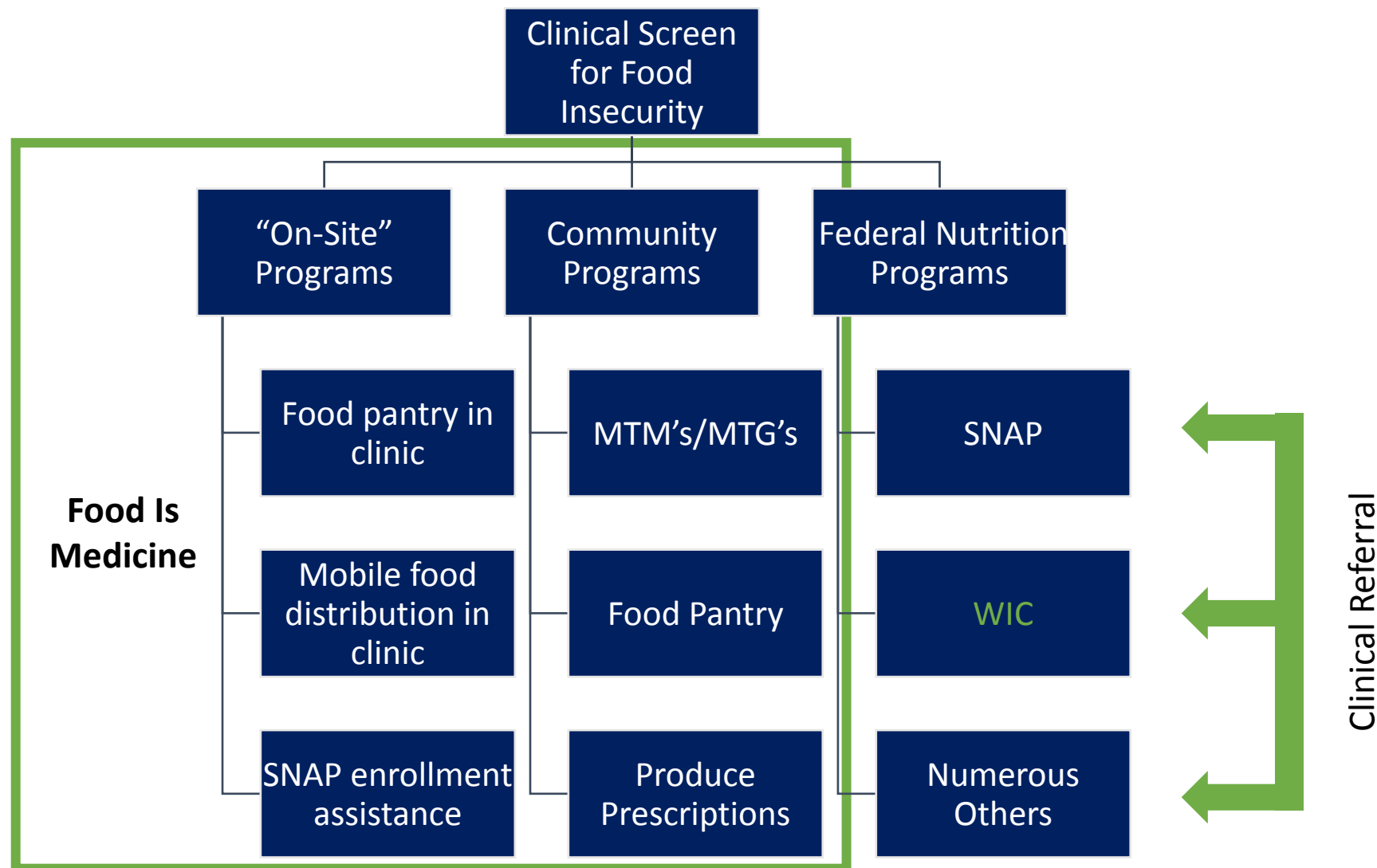
From the perspective of health care

MTM=Medically Tailored Meals

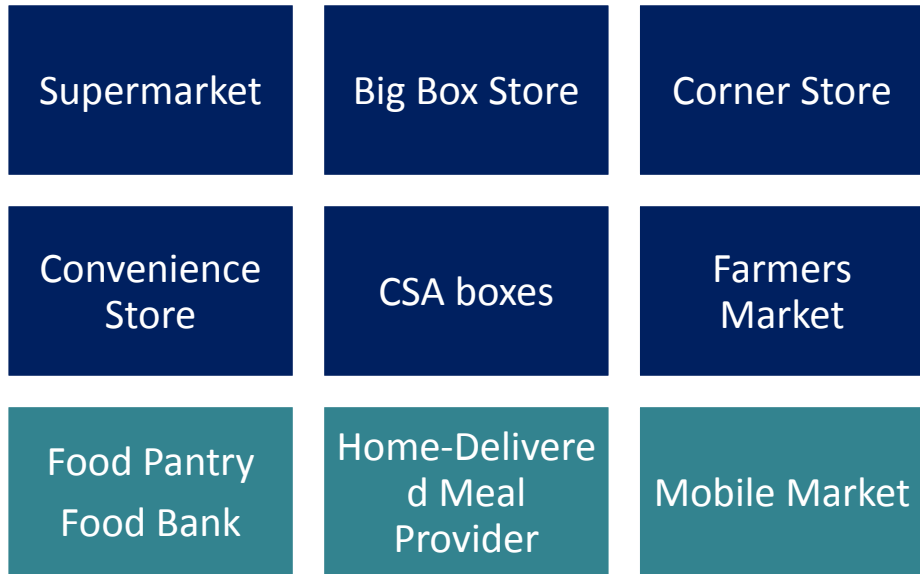
MTG=Medically Tailored Groceries

SNAP=Supplemental Nutrition Assistance Program

 = “food is medicine”

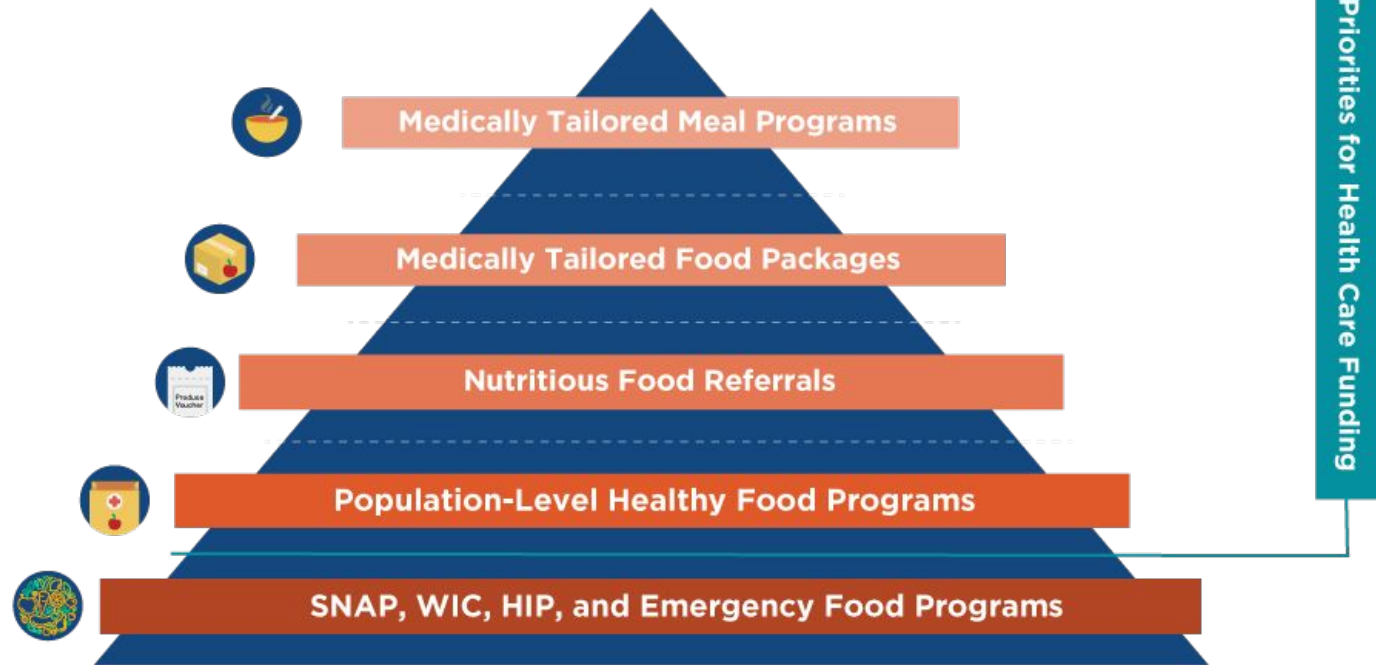


System Fragmentation



Treatment
↕
Prevention

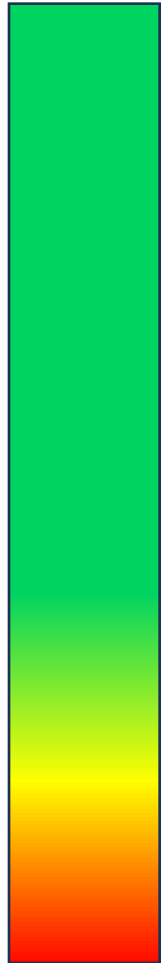
FOOD IS MEDICINE PYRAMID



“CSA boxes” refers to delivery of foods directly from the farm to a household.

**What do we know about
the impact of FIM
programs?**

Studies of FIM Programs Show Improvements in Some, but Not All, Outcomes



Resource Use

Food Security

Health behaviors (inc Diet Quality)

Clinical outcomes

Cost & utilization

Modelling Studies Have Limitations but Can Fill in Some Gaps

Prescribing healthy food in Medicare/Medicaid is cost effective, could improve health outcomes

New study finds that health insurance coverage for healthy food could improve health, reduce healthcare costs, and be highly cost-effective after five years

Medicare/Medicaid: Healthy food prescriptions



Fruits



Nuts/
Seeds



Vegetables



Whole
grains



Seafood



Plant oils

Insurance covers
30% of cost of eligible
food



\$100 billion

less in healthcare
utilization over
model population's
lifetime



Cost-effective after
5 years

Less diabetes

120
thousand cases
prevented or
postponed

Less cardiovascular disease

3.28
million cases
prevented or
postponed

As or more cost-
effective than
many currently
covered medical
treatments



For more information, see "Cost-effectiveness of financial incentives for improving diet through Medicare and Medicaid: A microsimulation study" by Lee et al. (2019).
<https://doi.org/10.1371/journal.pmed.1002761>

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



**Why is the data so
limited?**

Evaluation Challenges

- Almost all programs reach a small number of people
 - Not suitable* for examining health outcomes, utilization, & cost
- Almost all programs offer a relatively small dose & duration
 - Not suitable* for examining health outcomes, utilization & cost
- Many programs are single-site
 - Limited applicability to the field as a whole
- Bottom line: You need a LOT of data to show an impact
 - Most programs have limited funds available for evaluation

“This is really hard!”

* I would argue it is also not ethical

Why is so much data needed to prove impact on health outcomes, utilization, & cost?

- Food security and nutrition programs are generally
 - Better at prevention than at treatment
 - Expected to have an impact over a long length of time
 - Proven by their SMALL effect on a LARGE number of people, rather than their LARGE effect on a SMALL number of people
- If you anticipate a SMALL effect, to show an impact you need
 - A lot of people
 - A long duration of “treatment”
 - A high “dose”
 - A long duration of observation





Current Considerations in Implementation



LOCAL ORGANIZATIONS

- Embedded in communities
 - Cultural competency
 - Personalized service
- Decades of experience
 - Non-profit mission

NATIONAL COMPANIES

- Shovel-ready
- Enormous scale
- Access to rural areas
 - Efficiency
- Capacity to bill healthcare for services



FOCUS ON PEOPLE WITH HIGH DISEASE BURDEN

- Momentum
- Can “prove ROI” in a short-time frame
- Aligns with an annual HC budget

FOCUS ON PREVENTION

- Many more people are eligible
- May prevent onset of disease completely
- Population as well as individual impacts
 - ROI is greater in the end



HIGH DOSE – LOW REACH

- Smaller number of people benefit
 - More likely to have a demonstrable impact on health outcomes
- Habit formation allows for maintenance of effect

LOW DOSE – HIGH REACH

- Reach more people & leave out fewer people
 - Households, rather than individuals (multi-generational impacts)
- Population level impact likely even with a small effect size



CHOICE

- Dignity
- Support of local retail
- May be higher value for the individual participant

PRE-SELECTED FOOD ITEMS

- Efficient
- Local sourcing
- Exposure to new foods



**TARGET POPULATION:
FOOD INSECURITY**

- Roots of FIM movement
- Focuses resources on a less advantaged group
- Pushes healthcare to develop systems to address SDH

**TARGET POPULATION:
CHRONIC DISEASE**

- May be more politically feasible
- Does not require screening for food insecurity
- Allows wider access to healthy food benefits

Disparities

- People with reduced access to health care
 - Uninsured and underinsured
 - States that did not expand (or will be rolling back) Medicaid
- Communities that had poorer access to healthy food to begin with
 - Rural vs urban
 - Neighborhoods with full-service grocery stores vs neighborhoods without
- Reinforcing existing disparities in the agricultural sector

What does equity mean in the context of scale?



**Where are the
opportunities?**

Opportunities for *the Field*

Access to Large Amounts of Data

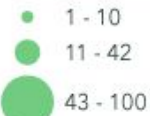
- Shared metrics across numerous programs
 - eg GusNIP Produce Prescription Programs
- Large health systems with a single electronic health record
 - VA, Indian Health Service, other integrated health systems
- Health insurers
 - Claims data

Produce Prescription Programs in the United States: 2010-2020

Legend

Active Produce Prescription Headquarters

Counties Covered



Inactive Produce Prescription Program Headquarters

Counties Covered



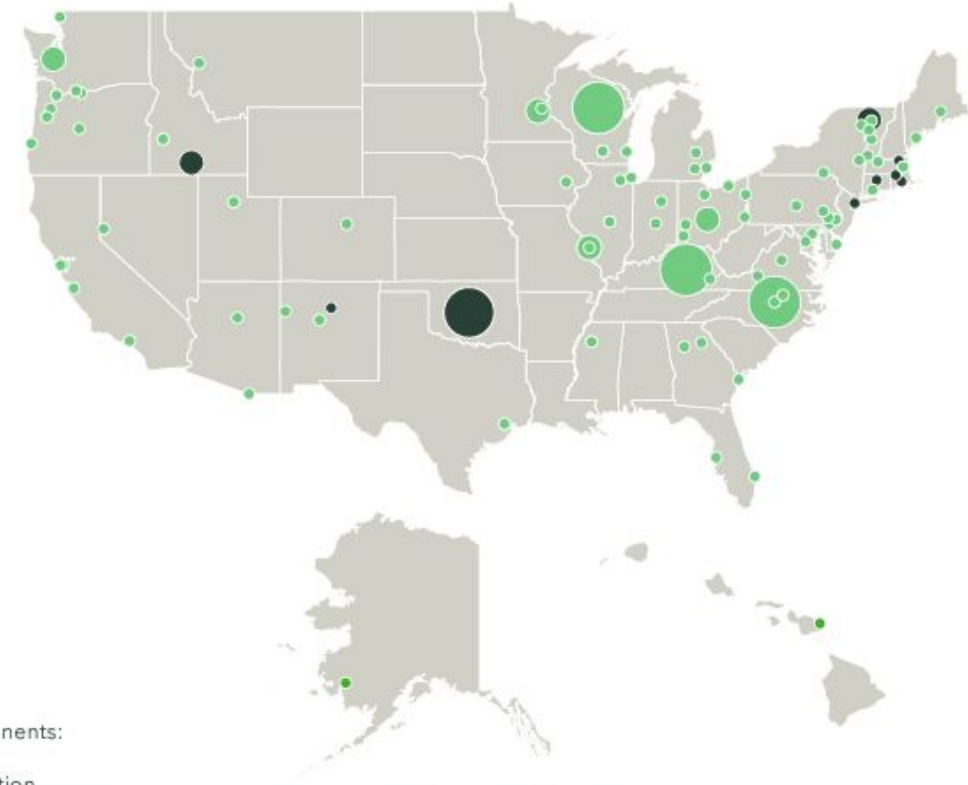
US State Boundaries

Number Active Programs: 94

Number of Inactive Programs: 14

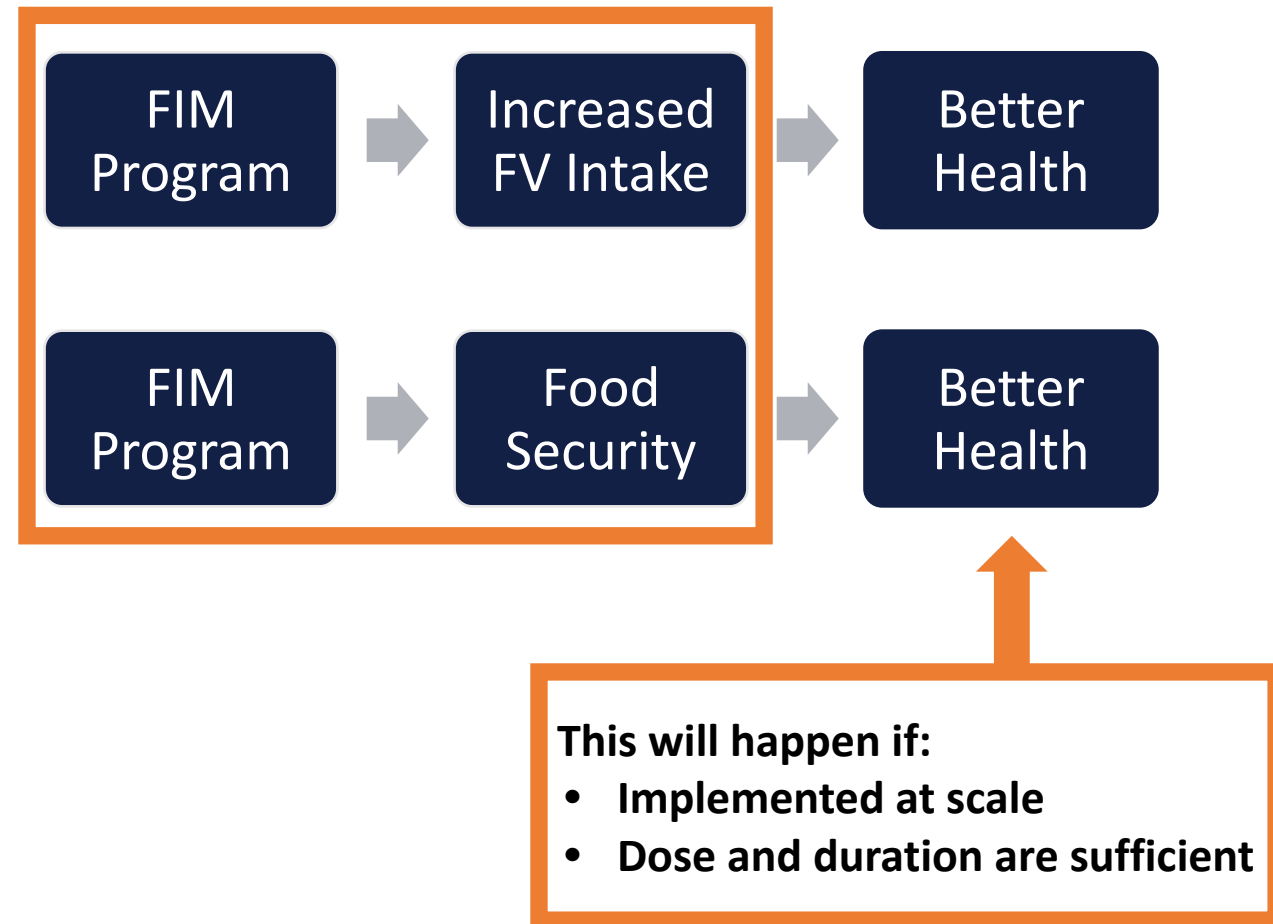
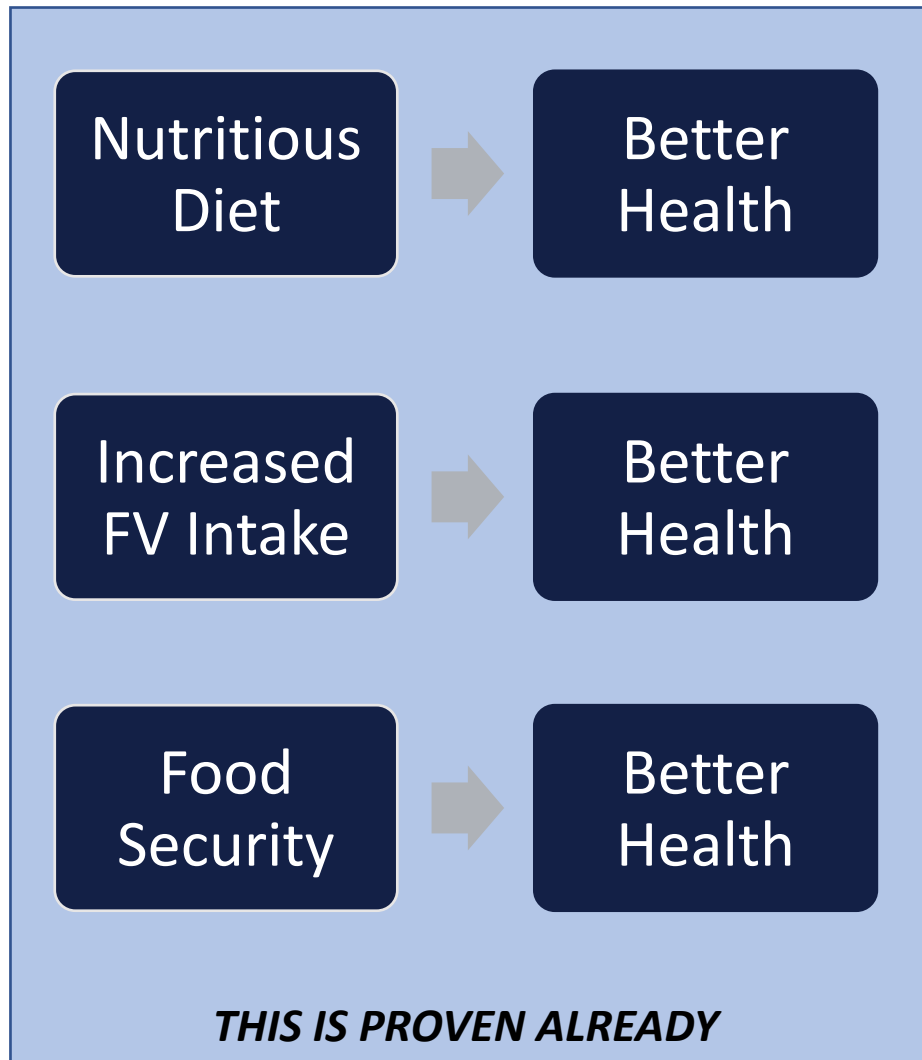
Map reflects programs with these components:

- patient eligibility screening
- partnership with a healthcare organization
- prescriptions for healthy produce (fruits & vegetables with no added fats, sugars & salts at no or low cost)
- repeated dosage
- retail redemption



Opportunities for *Individual Programs*

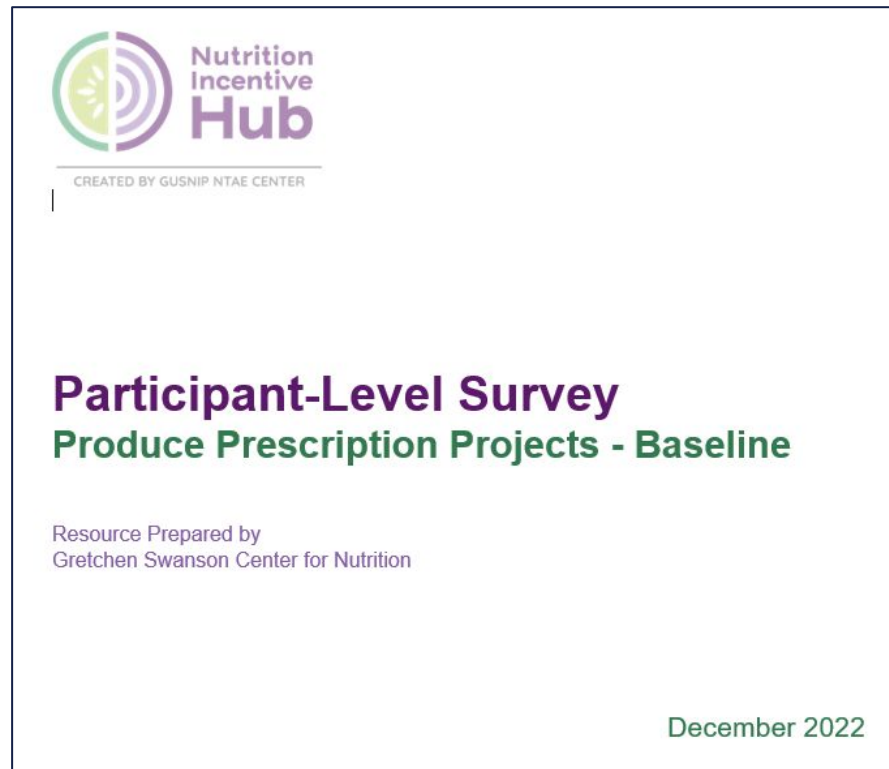
Controversy
Alert!



Opportunities *for Individual Programs:* Shared Metrics

Budd Nugent N, Byker Shanks C, Seligman HK, Fricke H, Parks CA, Stotz S, Yaroch AL. Accelerating Evaluation of Financial Incentives for Fruits and Vegetables: A Case for Shared Measures. Int J Environ Res Public Health. 2021 Nov 19;18(22):12140.

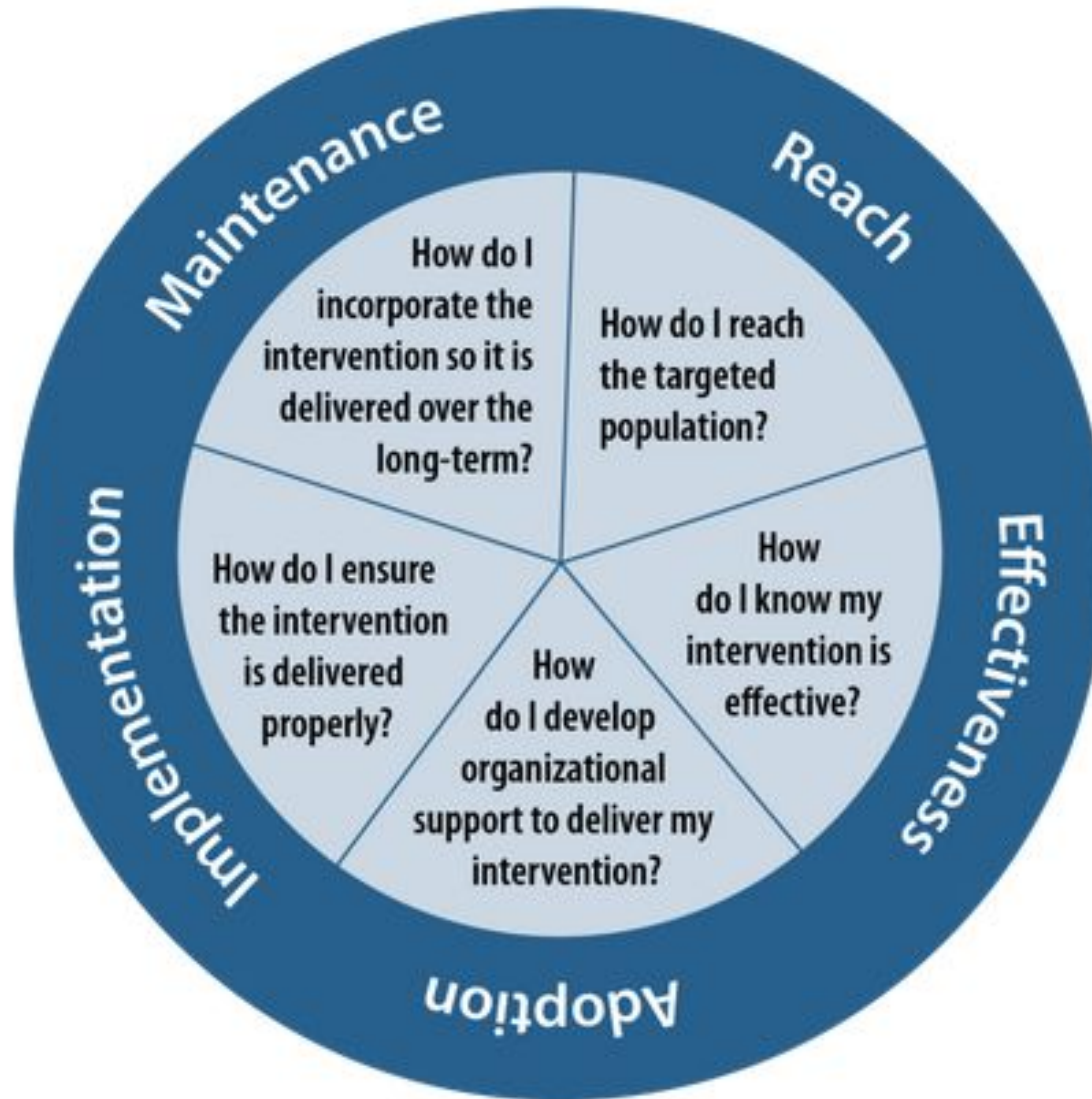
Shared metrics ☐ pooled data ☐
More participants
More sites



- Food security
- FV intake
- SNAP participation
- Program satisfaction
- Health status
- Basic demographics

<https://www.nutritionincentivehub.org/resources/resources/reporting-evaluation/core-metrics-produce-prescription/participant-level-metrics>

Elements of the RE-AIM Framework



Opportunities for Individual Programs: Implementation Science

Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Publ Health* 1999;89(9):1322–7.

Food is Medicine

- FIM programs support food security and healthy diets
- Tremendous momentum toward implementing & evaluating FIM programs across the US
- Evaluation of FIM programs is hard
 - Resist the temptation to re-prove that nutritious food and food security are good for your health
 - Right-size your evaluation for the size of your program
 - Implementation science studies are critical
 - Use the same metrics others are using, when possible
 - We need (and are awaiting) the large, rigorously conducted trials

Food is Medicine: An Opportunity to Support Local Ag in Rural Regions and Beyond

Jennifer A. Garner, PhD, RD

John G. Searle Assistant Professor of

Nutritional Sciences

School of Public Health,

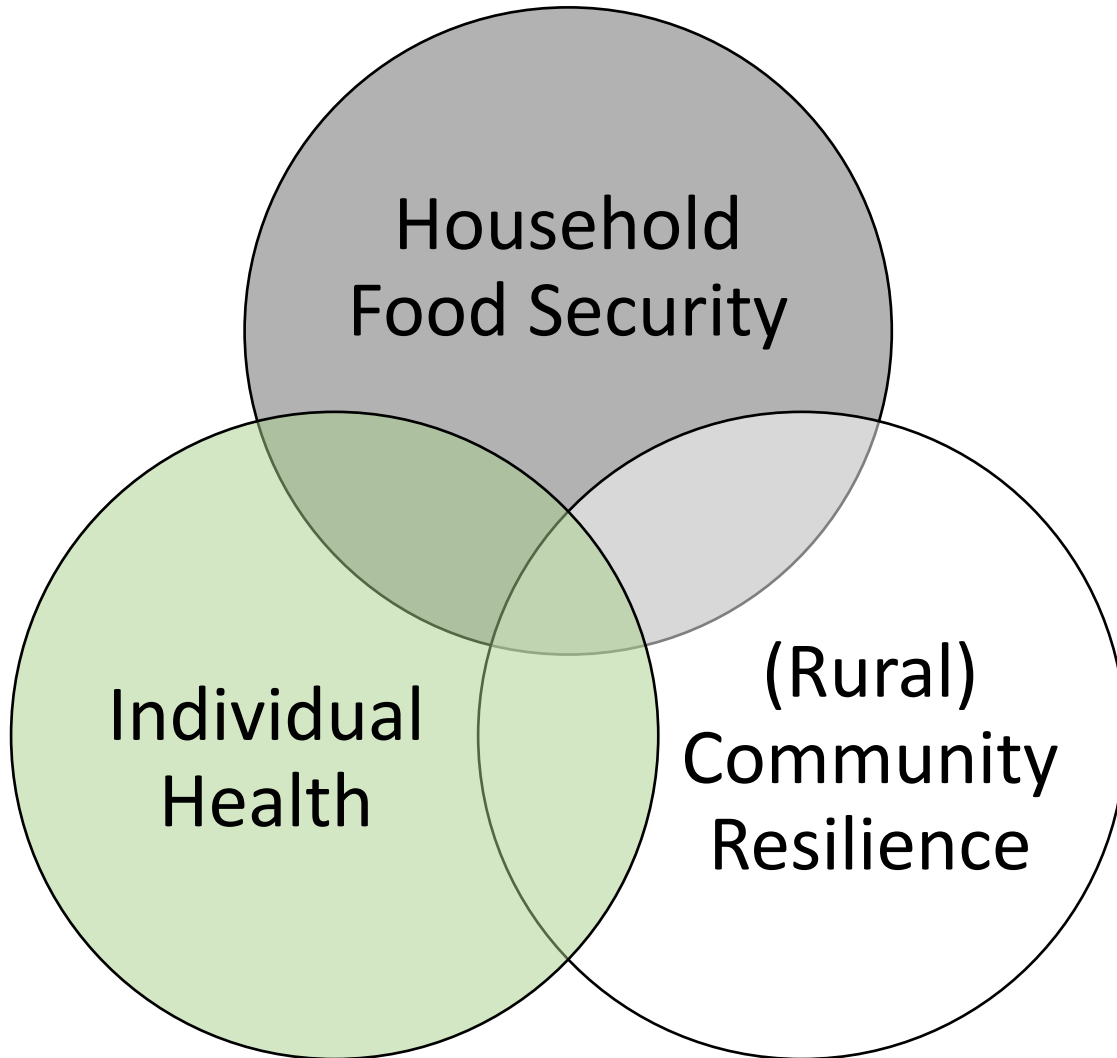
University of Michigan

Ida Douth

Project Lead

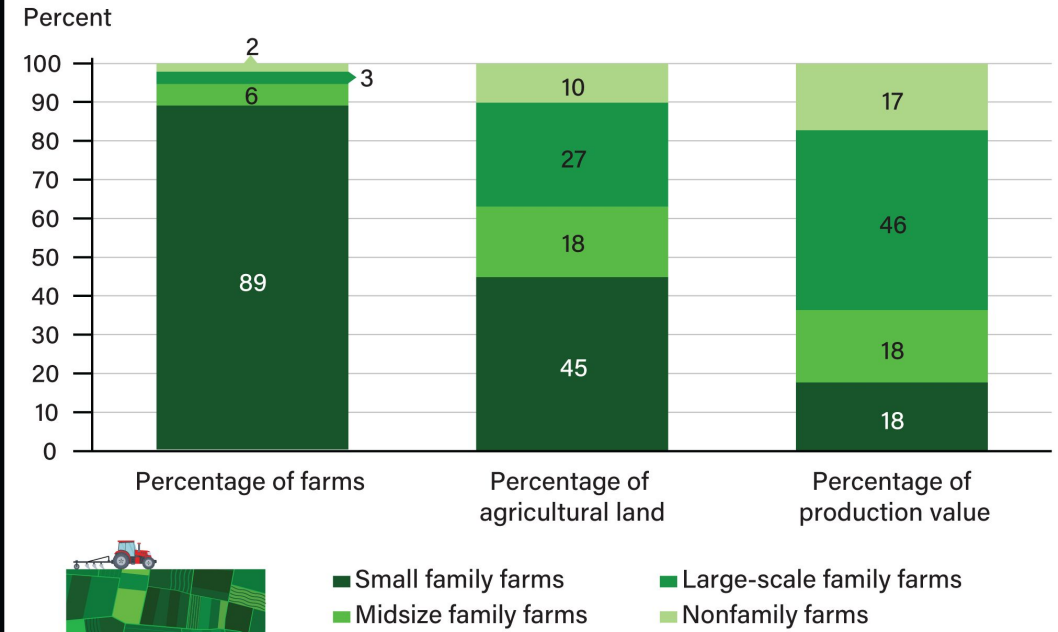
Community Health & Nutrition
Programming, Community Health
Improvement Associates

A 'Triple Win' for a Trio of Concerns?



Distribution of farms, agricultural land, and value of production, by farm type, 2021

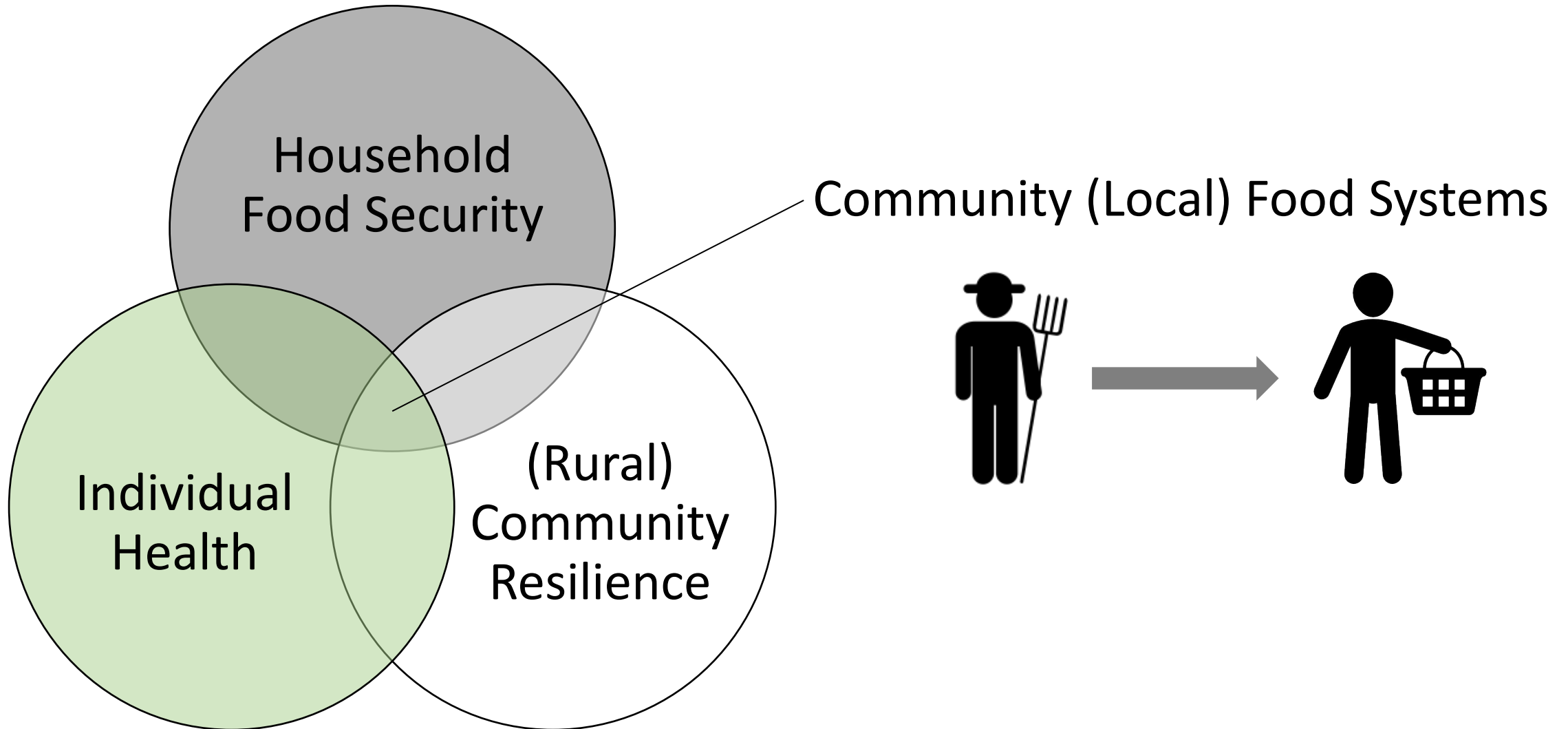
USDA Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE



Note: **Small family farms** have gross cash farm income (GCFI) less than \$350,000. **Midsize family farms** have GCFI between \$350,000 but less than \$1 million. **Large-scale family farms** have GCFI of \$1 million or more. **Nonfamily farms** are any farm where any operator and any individuals related to them do not own a majority (50 percent) of the business. Land operated is the sum of owned land and leased land, less land leased to others.

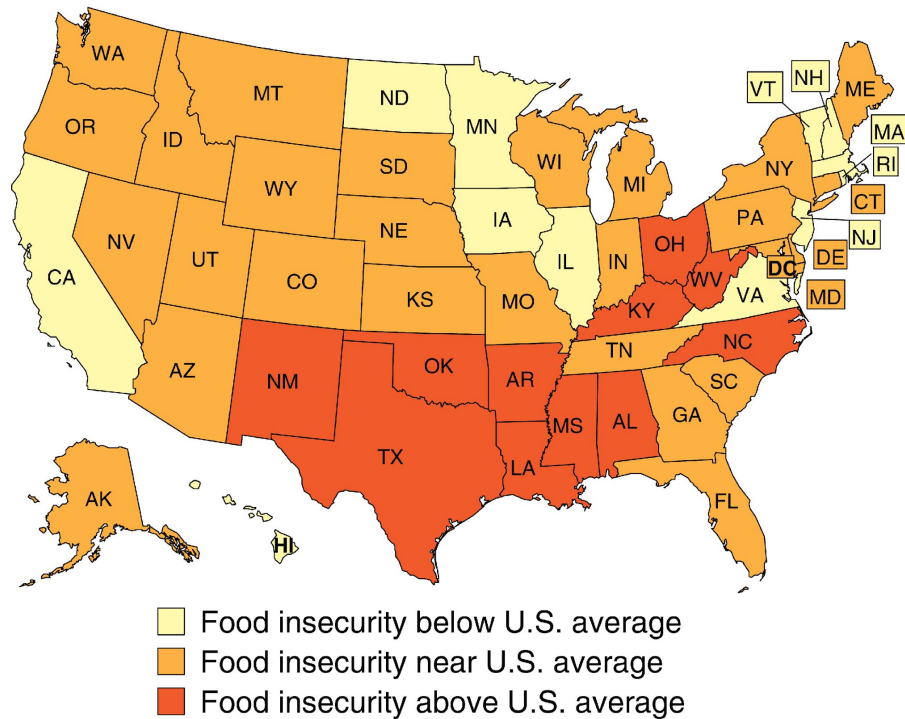
Source: USDA, Economic Research Service (ERS) using USDA, National Agricultural Statistics Service and USDA, ERS, 2021 Agricultural Resource Management Survey data.

A 'Triple Win' for a Trio of Concerns?



Regional Context

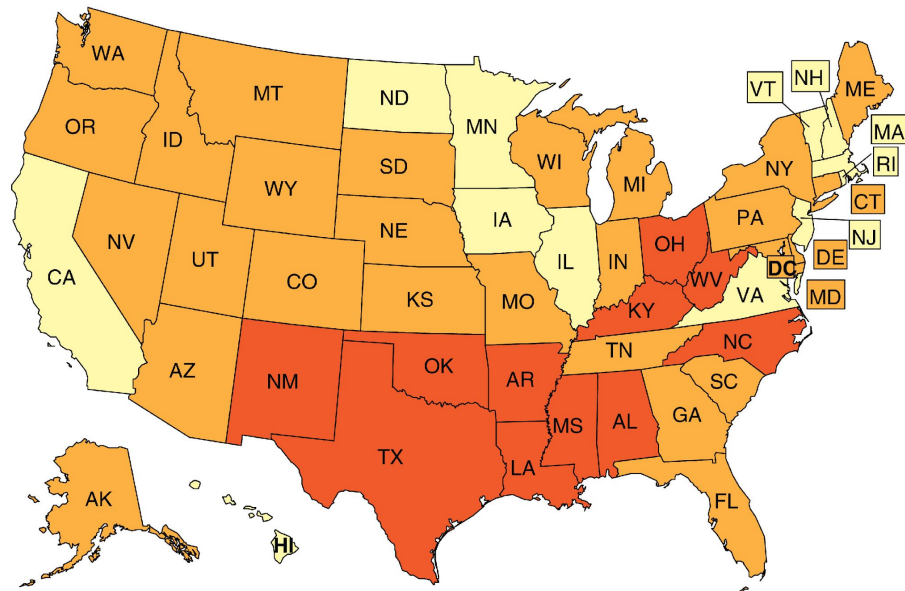
Prevalence of food insecurity, average 2017-19



Source: USDA, Economic Research Service using data from the December 2017, 2018, and 2019 Current Population Survey Food Security Supplements.

Regional Context

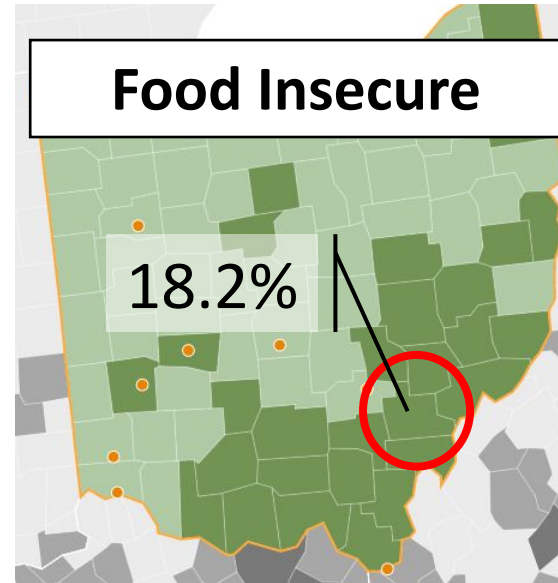
Prevalence of food insecurity, average 2017-19



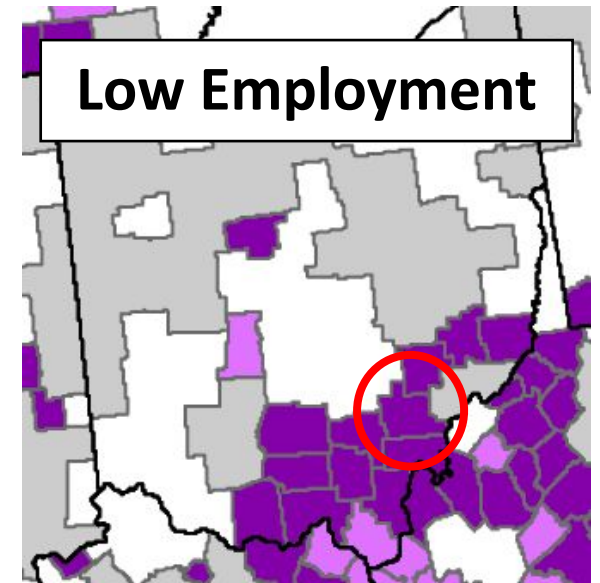
- Food insecurity below U.S. average
- Food insecurity near U.S. average
- Food insecurity above U.S. average

Source: USDA, Economic Research Service using data from the December 2017, 2018, and 2019 Current Population Survey Food Security Supplements.

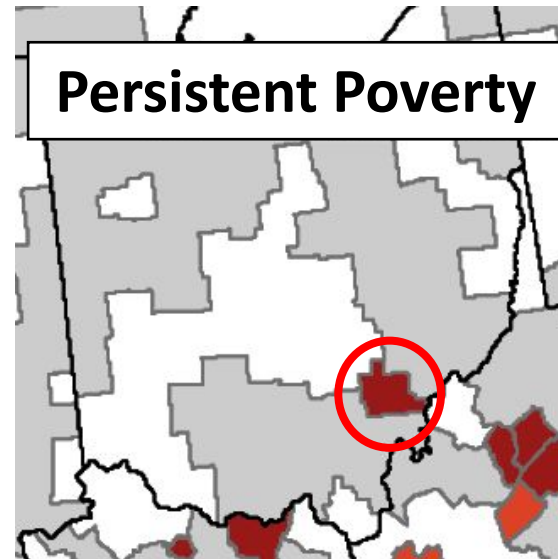
Food Insecure



Low Employment



Persistent Poverty



Persistent Child Poverty



Food is Medicine in the Rural Context: *The Southeastern Ohio PRx Partnership*



Food is Medicine in the Rural Context: *The Southeastern Ohio PRx Partnership*





Local Agricultural Calendar

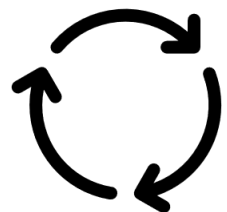
*“Patients said that they didn’t have many fruit options. And I would always respond with, **“It’s seasonal. It’s hard. We’re getting this stuff locally.”** “Sometimes we would get a whole bunch of green peppers and onions, and then there wouldn’t be a lot of variety. So it would be kind of whatever fruit, whatever produce was in season, which I think is common. **But I think patients were somewhat frustrated,** that they were like, “Well if I go to Krogers and purchase this, then I can get a lot more variety, so I’m not going to shop here.”*

- Country Fresh Stop site representative



Seasonal Ebb & Flow

*“**Wintertime is tough** because we’re not getting as much produce. Then, especially as people start relying on that or are more accustomed to getting that produce... when that dies off, **they’re like, ‘Oh where are my veggies?’.**”*
-Donation State site representative



Our Revised (Pilot) PRx Model



PRODUCE PRESCRIPTIONS OPEN FOR 2025 SEASON!

PICK UP A FREE SHARE OF PRODUCE EVERY WEEK AT THIS CLINIC!

PROGRAM REQUIREMENTS:

Clients must...

- Be experiencing food insecurity
- Have a diet-related chronic condition, such as diabetes
- Be willing to commit to participating in the program from May 2025 through January 2026
- Be willing to complete program surveys

WHAT IS A PRODUCE PRESCRIPTION?

Produce Prescriptions are weekly subscriptions of fresh produce that healthcare patients receive to help manage health conditions and address food insecurity. Rural Action and the Southeast Ohio Food Bank purchase, package, and distribute mixed shares of produce to Hopewell Health clinics, including this one. Hopewell Health providers refer patients to this program and help participants to utilize the fresh produce in healthy meals.



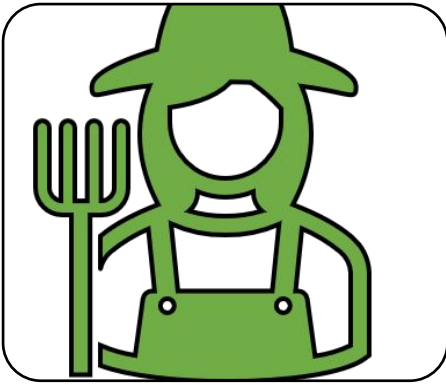
INTERESTED? TALK WITH YOUR HOPEWELL PROVIDER FOR A REFERRAL.



Key Changes

- **Streamlined data collection** ☐
aligned with GusNIP measures
- **Maximized utility of Electronic Health Record** via exclusive focus on patients with diabetes
- **Extended program duration** to 9 months via integration of local and non-local produce sources

Some Lessons Learned



For Implementation

- Integrating local produce with non-local produce can help balance organizational missions will patron demand.
- Leverage each sector's strength... breaking down silos doesn't have to mean overhauling workflows.



For Research

- EHR-centric data capture assumes a certain (higher) level of engagement with the healthcare system.
- Aggregate measures of health (e.g., AHA's Life's Essential 8) may afford more inclusive program inclusion criteria.

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Q&A

Announcements

Join us for the last session of the series!

- Wednesday, August 13th at 4pm-5pm ET
- Student Presentations!

To view past recordings,
scan QR code below

