



Prevention in Focus Webinar Series

Welcome!
We will begin shortly.

Prevention in Focus Webinar Series

The Challenge and Promise of Food is Medicine



Hilary Seligman, M.D., M.A.S.

Professor of Medicine and of Epidemiology and Biostatistics
University of California San Francisco

Introduction by: Norma J. Minkoff
NIH Office of Disease Prevention



National Institutes of Health
Office of Nutrition Research

NIH Wide Collaboration on Food is Medicine

June 29th 2023

Christopher J. Lynch, Ph.D.

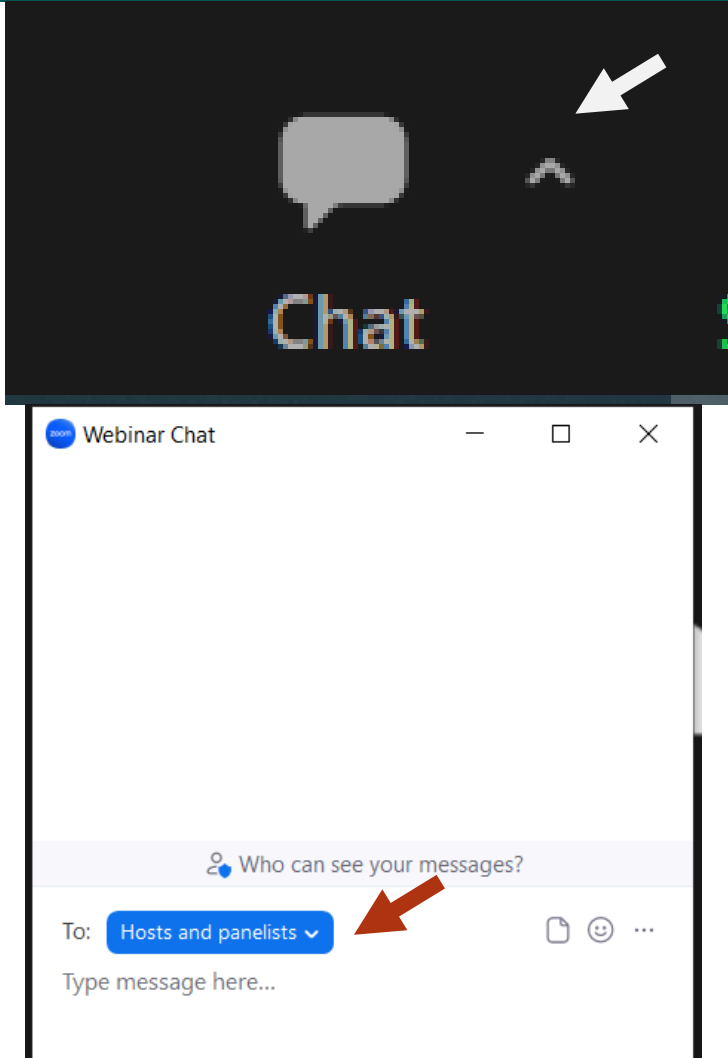
Acting Director, NIH Office of Nutrition Research

NIH OD

Collaboration on Food is Medicine Activities at NIH

- ODP and ONR led recent NIH wide workshops in clinical nutrition where Food is Medicine might be a potential solution: [Nutrition as Prevention for Improved Cancer Health Outcomes](#) and [Malnutrition in Clinical Settings: Research Gaps and Opportunities](#)
- An NIH wide [Medical Nutrition Working Group](#) has been charged with coordinating Food is Medicine activities
- ONR is representing NIH on an Interagency Food as Medicine Workgroup
- NIH coordinated the development and release of [NOT-OD-23-107, Request for Information \(RFI\): Food is Medicine Research Opportunities](#) with 12 Federal Agencies and 19 NIH Institutes, Centers and Offices interested in this topic
- ONR cleared a Food is Medicine concept at NIH Council of Councils and developed a perspective on [Food is Medicine Networks or Centers of Excellence](#) published in AJCN

Prevention in Focus Webinar Series



Upcoming Q&A Session

Please send us your questions
via the **Chat pod** directed to
Hosts and Panelists

Please use the Chat pod to request technical assistance

Prevention in Focus Webinar Series

The Challenge and Promise of Food is Medicine



Hilary Seligman, M.D., M.A.S.

Professor of Medicine and of Epidemiology and Biostatistics
University of California San Francisco

Introduction by: Norma J. Minkoff
NIH Office of Disease Prevention

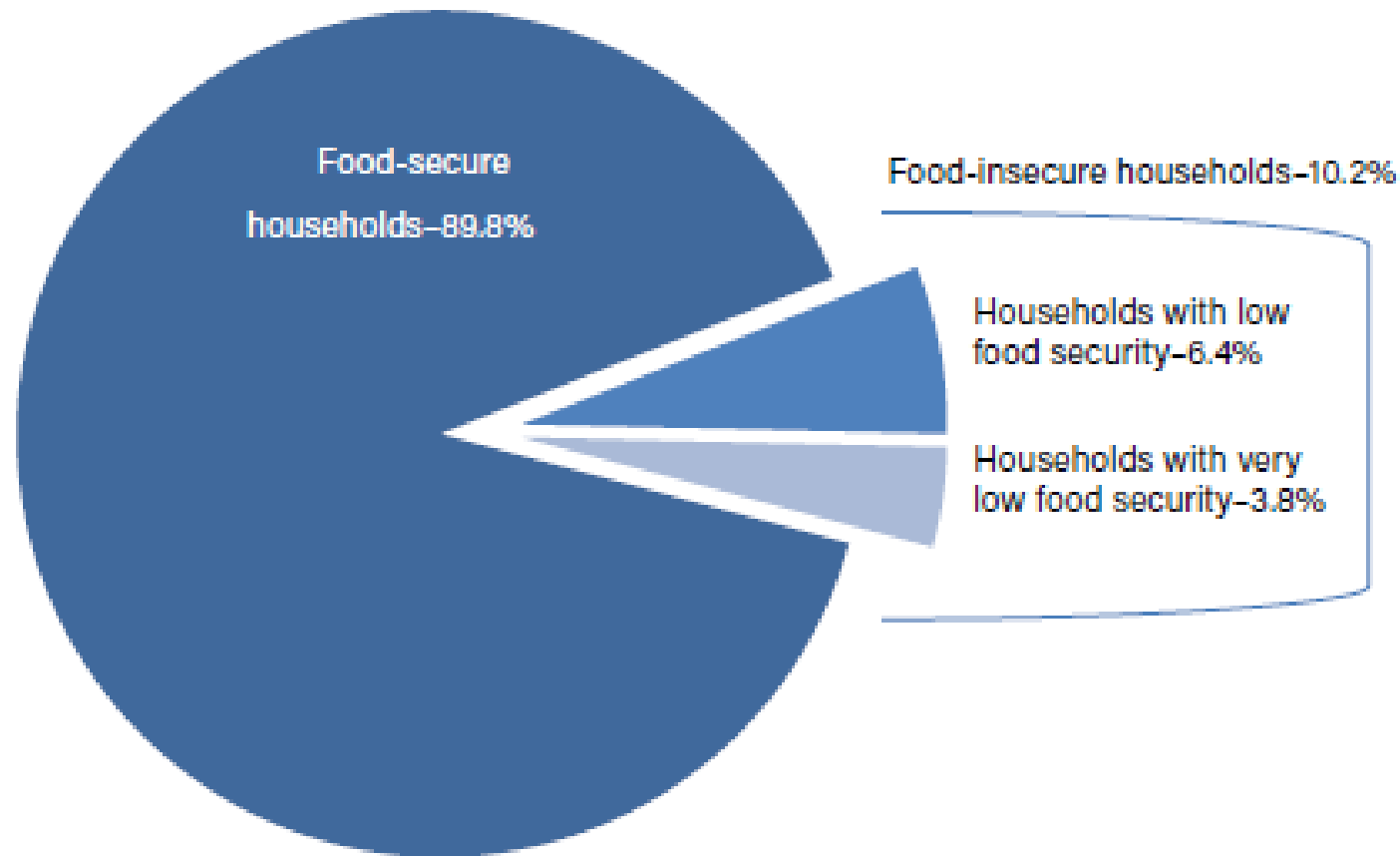
The Challenge and Promise of Food is Medicine

Hilary Seligman MD MAS

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

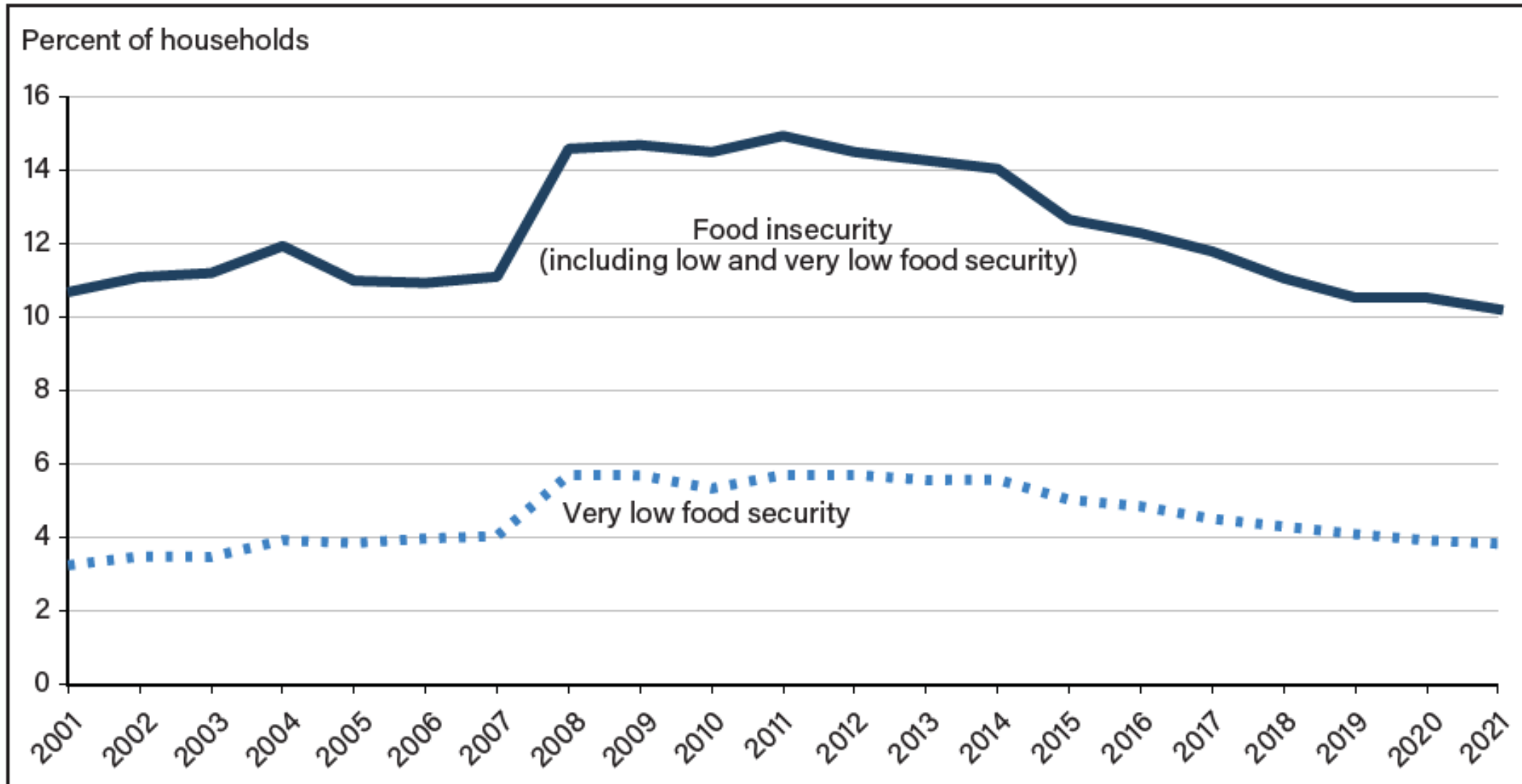
1 in 10 US Households Food Insecure in 2021

U.S. households by food security status, 2021



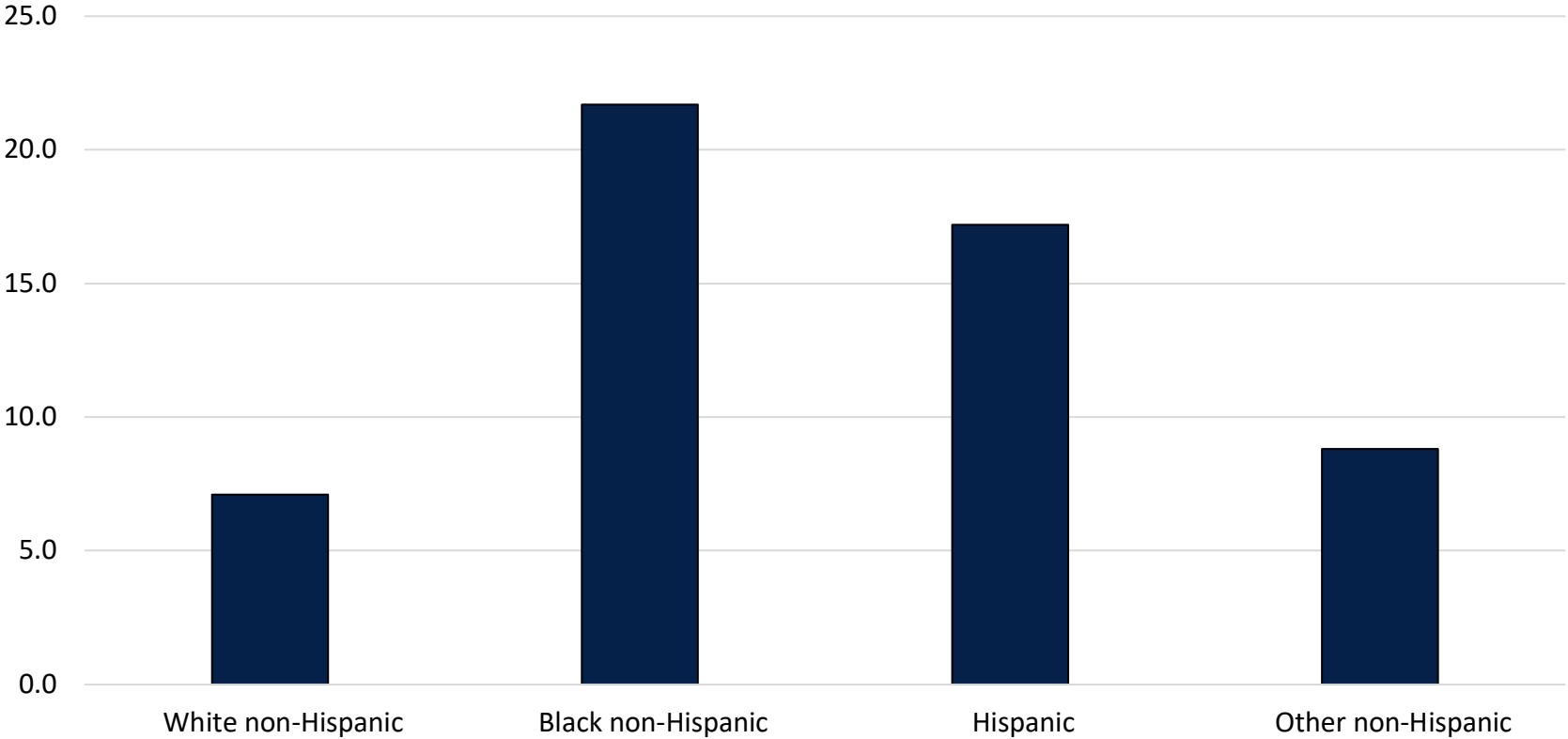
Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census, 2021 Current Population Survey Food Security Supplement.

Trends in prevalence of food insecurity & very low food insecurity in US households, 2001-21



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

Disparities in food insecurity rates by race, 2020



Source: USDA, Economic Research Service, using data from the December 2020 Current Population Survey Food Security Supplement, U.S. Census Bureau

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

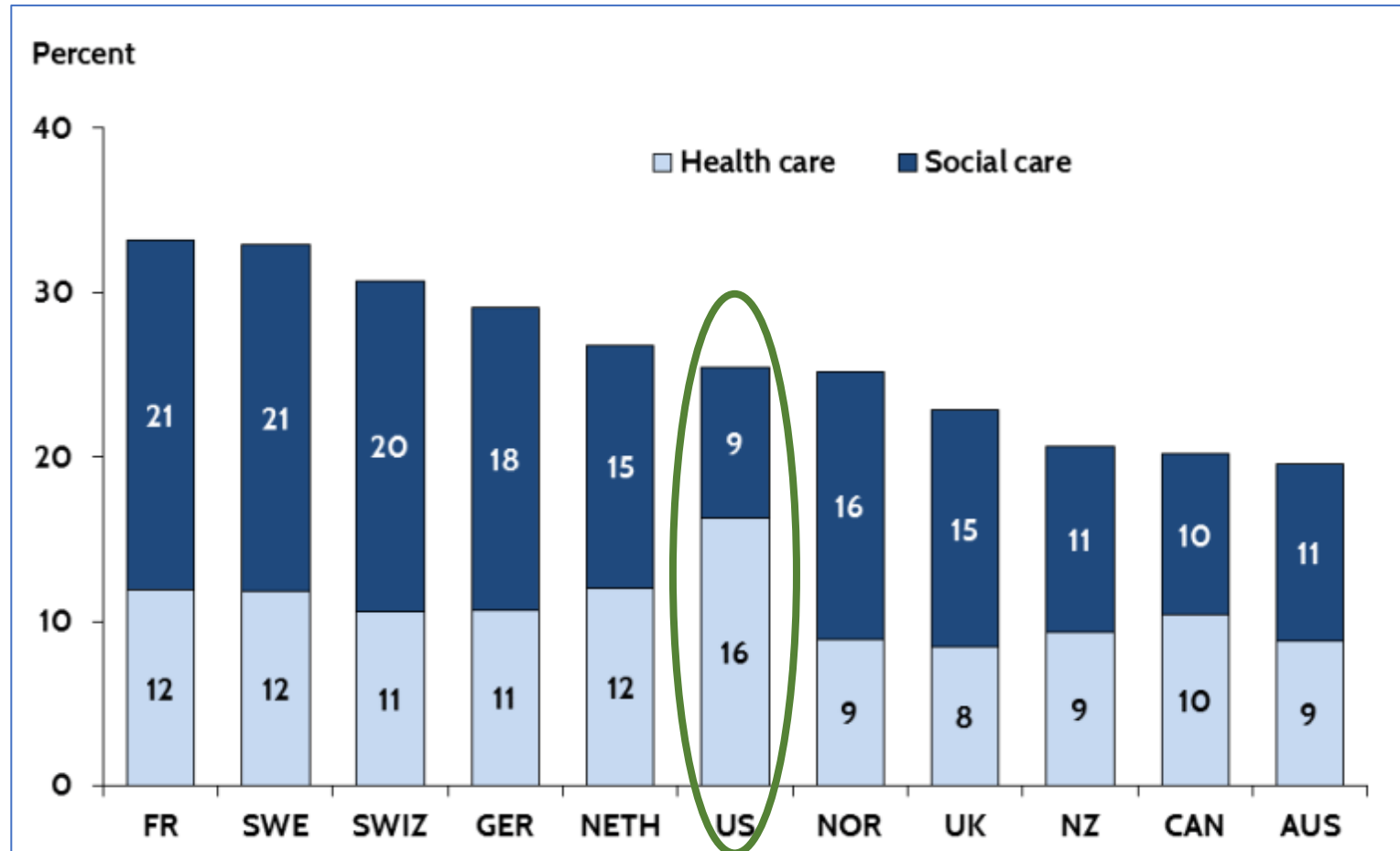


Figure 1. Health and Social Care Spending as a Percentage of GDP

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

SOCIAL DETERMINANTS AND SOCIAL NEEDS – MOVING UPSTREAM

STRATEGIES

TACTICS

Improve
Community
Conditions

Laws, policies and regulations that create
community conditions supporting health for
all people

UPSTREAM

Addressing
Individual's
Social
Needs

Include patient screening questions
about social factors. Use data to
inform and provide referrals.

Social workers, community health workers,
and community organizations providing
Direct support to meet patients social needs

MIDSTREAM

Providing
Clinical
Care

Medical
Interventions

DOWNSTREAM

Social
Determinants of
Health

Social Needs

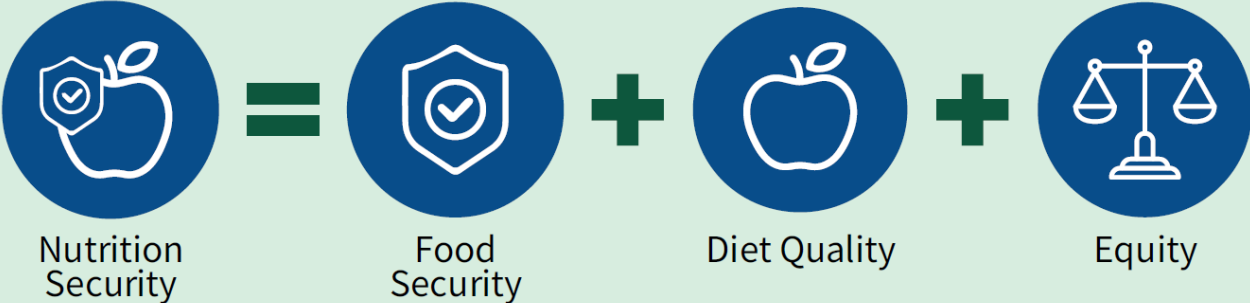
“Meeting Individual Social Needs Falls Short Of Addressing Social Determinants Of Health,” Health Affairs Blog, January 16, 2019.

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.

Food Is Medicine



- 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**


Spectrum of FIM Programs

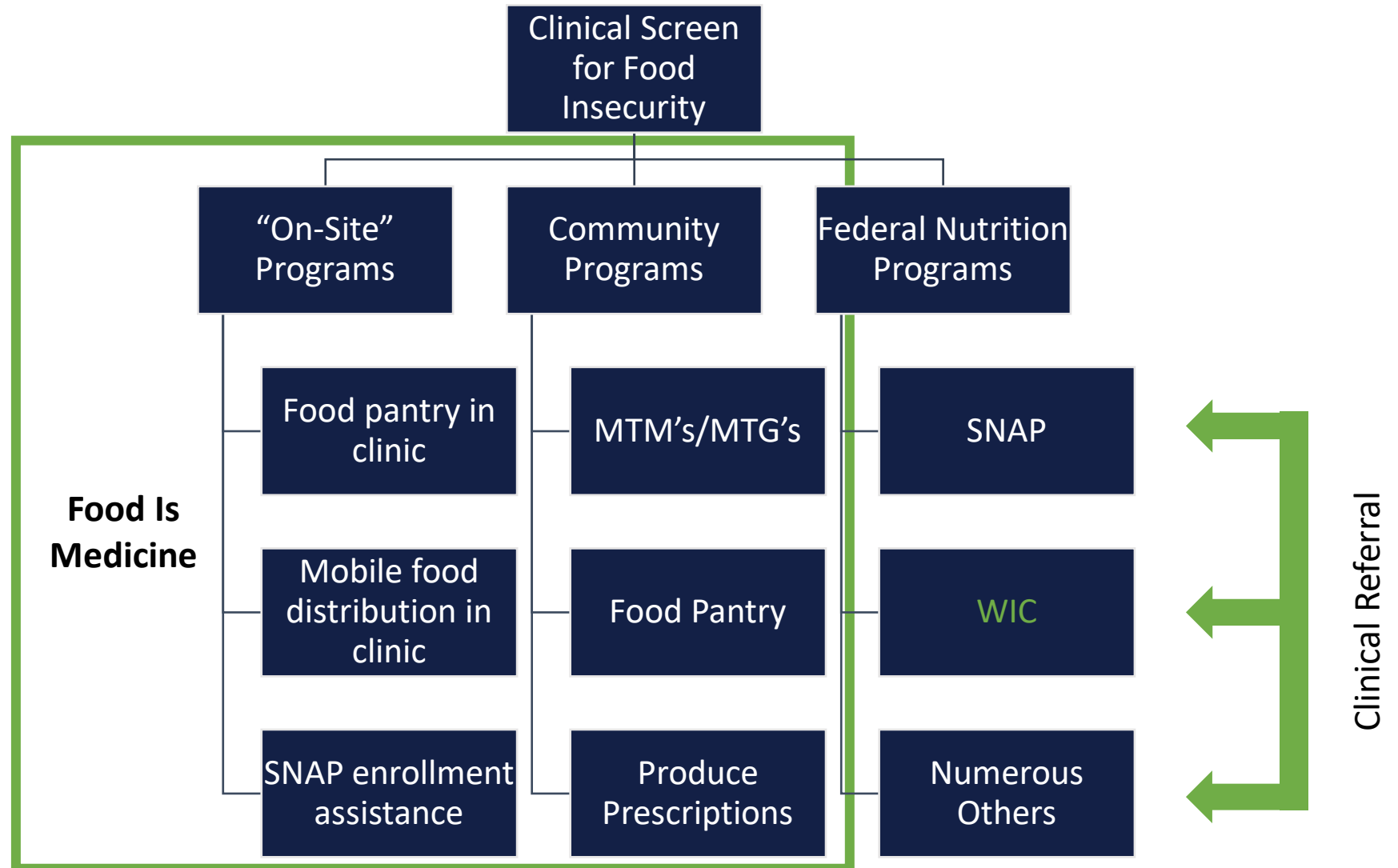
From the perspective of health care

MTM=Medically Tailored Meals

MTG=Medically Tailored Groceries

SNAP=Supplemental Nutrition Assistance Program

 = "food is medicine"



Largest FIM Program

PROPOSED UPDATES TO THE WIC FOOD PACKAGES



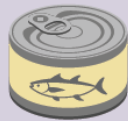
OVERVIEW

WIC is a powerful public health program, proven to help moms, babies, and young children thrive. USDA's Food and Nutrition Service is recommending science-based updates to the food provided to WIC participants to best meet their nutritional needs and foster healthy growth and development. Some of the proposed changes are highlighted below.



BREASTFEEDING SUPPORT

Increase support for mothers who mostly, but not exclusively, breastfeed **to support individual breastfeeding goals**



SEAFOOD

Improve access to **canned fish** to reflect the latest dietary guidance



DAIRY AND EGGS

Provide **more options**, such as different sizes of yogurt containers or substituting soy yogurt for milk or tofu for eggs



FRUITS AND VEGETABLES

Increase **fruit and vegetable benefit by 3-4x**, focus on whole fruit, and increase variety of fruits, veggies, and legumes offered



GRAINS

Expand **whole grain options** to include things like quinoa, blue cornmeal, and whole wheat bagels

Can FIM programs be scaled?

PROVEN

Can FIM programs impact short and long term health outcomes?

PROVEN

Theory of Change



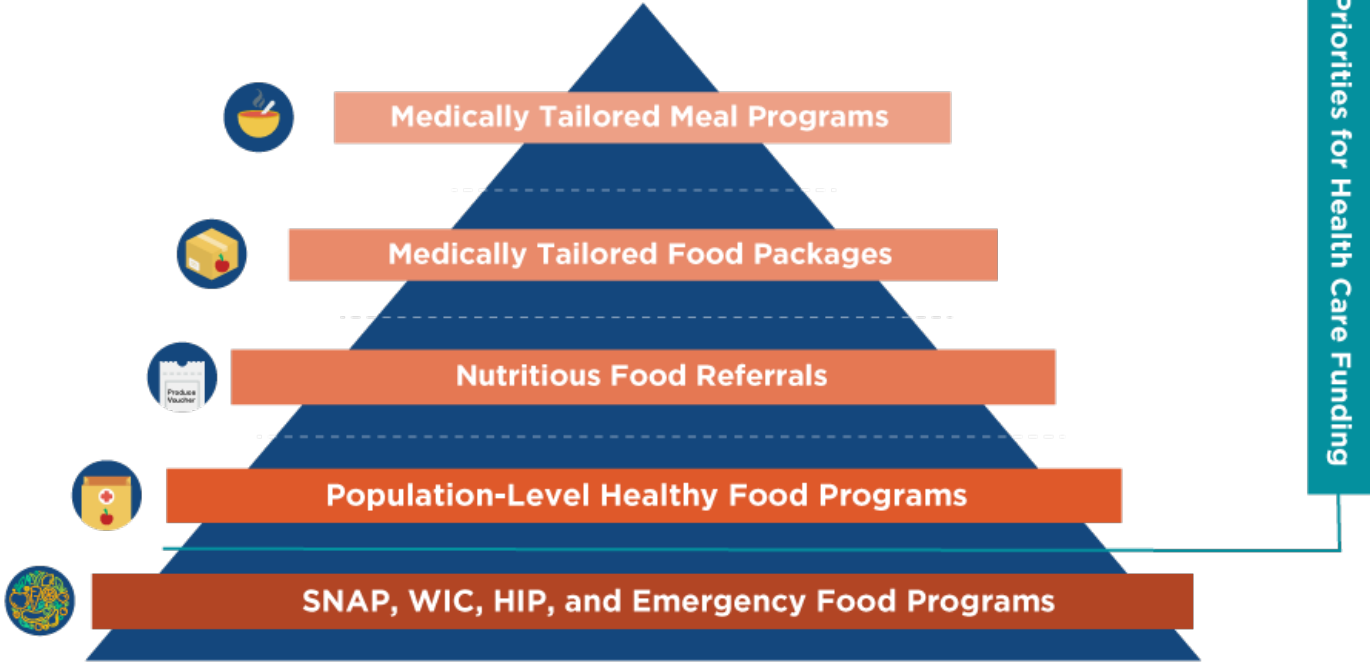
- Data transfer between sectors (health care, CBO, & food vendor)
- Data tracking within the electronic health record
- CBO capacity to provide food how, when, where and at the price that healthcare desires
- Fragmentation of the ecosystem outside of healthcare

System Fragmentation

Supermarket	Big Box Store	Corner Store
Convenience Store	CSA boxes	Farmers Market
Food Pantry Food Bank	Home-Delivered Meal Provider	Mobile Market

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?

Summary of Research

	Weak Evidence	Moderate Evidence	Strong Evidence
WIC			✓
	diet quality, food security, maternal & child birth outcomes, immunization rates, child academic performance		
SNAP			✓
	health outcomes, reduces medication non-adherence, and reduces health care expenditures		
MTM's		✓	
	hospital admissions and readmissions, lower medical costs, and improve medication adherence		
MTG's	✓		
	food security		
PPP		✓	
	diet quality, food security, diabetes outcomes		
On-site programs	✓		
	diet quality, food security, diabetes outcomes		

MTM=Medically Tailored Meals

MTG=Medically Tailored Groceries

SNAP=Supplemental Nutrition Assistance Program

PPR=Produce Prescription Program

Summary of Research

	Weak Evidence	Moderate Evidence	Strong Evidence
WIC			✓
	diet quality, food security, maternal & child birth outcomes, immunization rates, child academic performance		
SNAP			✓
	health outcomes, reduces medication non-adherence, and reduces health care expenditures		
MTM's		✓	
	hospital admissions and readmissions, lower medical costs, and improve medication adherence		
MTG's	✓		
	food security		
PPP		✓	
	diet quality, food security, diabetes outcomes		
On-site programs	✓		
	diet quality, food security, diabetes outcomes		

Aspen Inst FIM Research Action Plan

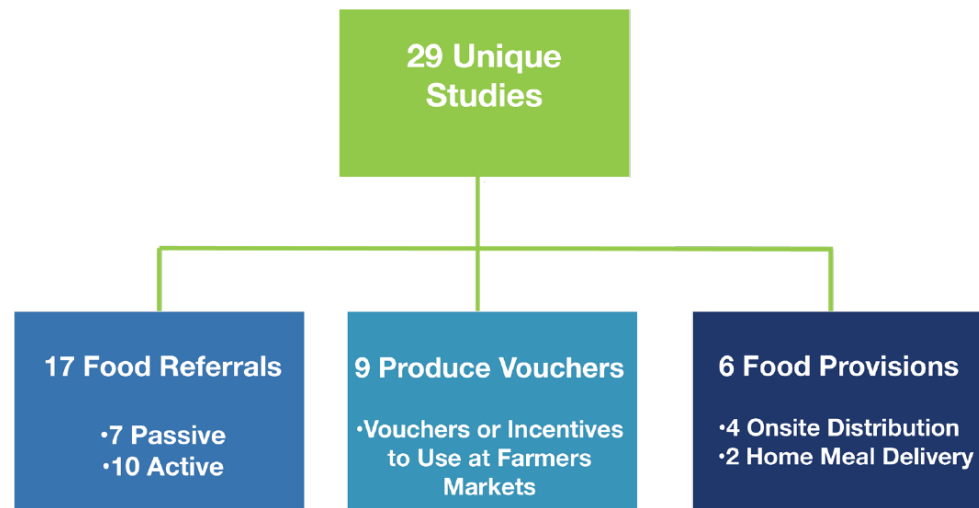
MTM's: 10 studies, 2 RCT's, 5 with a ctl group, & 5 with >100 pts

MTG's: 12 studies, 3 with a ctl group, & 5 with >100 pts

PPP: 27 studies, 5 with a ctl group, & 8 with >100 pts

Food Insecurity Interventions in Health Care Settings: A Review of the Evidence

Figure 1. Number of studies by type of intervention (n=29)



De Marchis E, Fichtenberg C, Gottlieb LM. Food insecurity interventions in health care settings: A review of the evidence. 2020. San Francisco, CA: Social Interventions Research & Evaluation Network. Available online.

Table 1. Summary of review results: Food insecurity interventions

Outcome	Impact		
	Referrals	Vouchers	Food*
Resource use	Mixed (4)	Improved (3)	-
Food security status	Improved [^] (2)	Improved (2)	Improved (1)
Health behaviors	Mixed (2)	Improved [#] (5)	Improved (1)
Health	Mixed (1)	Mixed (3)	Mixed (2)
Cost/utilization	Mixed (1)	-	Mixed (1)

Numbers in parentheses indicate the number of studies that reported on each outcome.

* Based on two studies of home-delivered meals, and one study of an intervention offering infant formula, nutrition educational materials, and referrals to social work, a medical-legal partnership, and food banks

[^] Based on a study with a sample size 13 and a qualitative retrospective study so should be interpreted with caution.

[#] All five studies found improvements, although in one case only for fruit consumption and in another the improvements were not statistically significant.

**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



**Where are the
opportunities?**



Before I get to the opportunities...

- Many of the next slides refer to produce prescription programs
 - There is lots of thought leadership and momentum here right now
- Produce prescription programs are not necessarily the best program for your clinic, your community, your patient population, etc.
- Almost ALL of the concepts are relevant to other FIM interventions

Opportunities for *the Field*

Access to Large Amounts of Data

- Shared metrics across numerous programs
 - e.g., 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

● 1 - 10

● 11 - 42

● 43 - 100

Inactive Produce Prescription Program Headquarters

Counties Covered

● 1 - 5

● > 5 - 14

● > 14 - 76

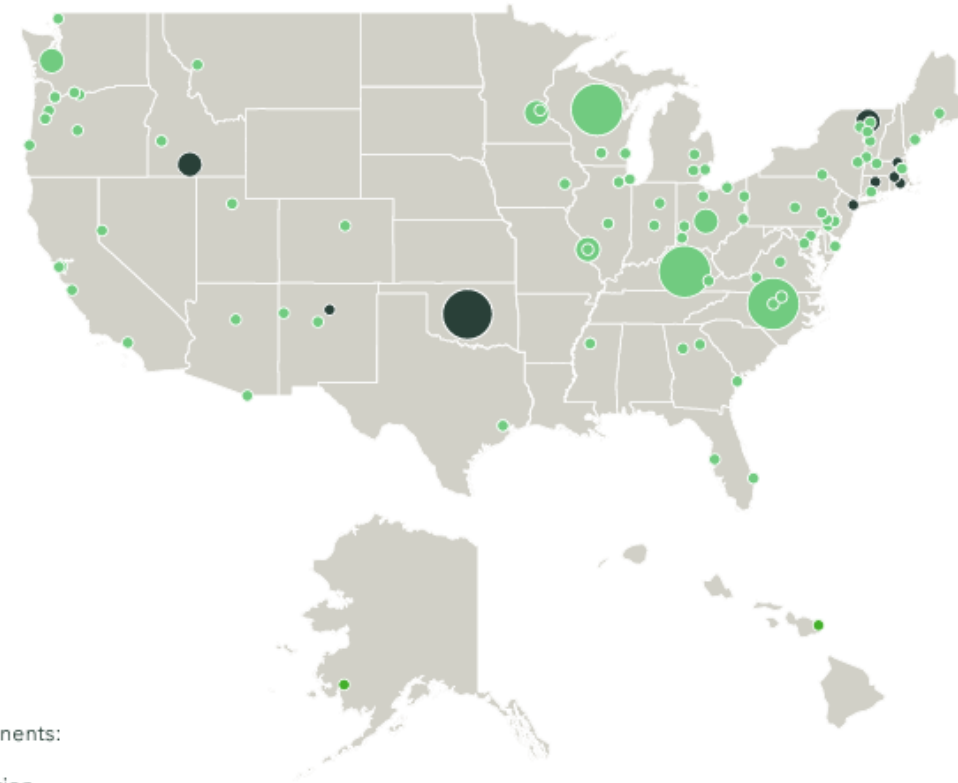
■ US State Boundaries

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 *the Field*: Modeling Studies

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

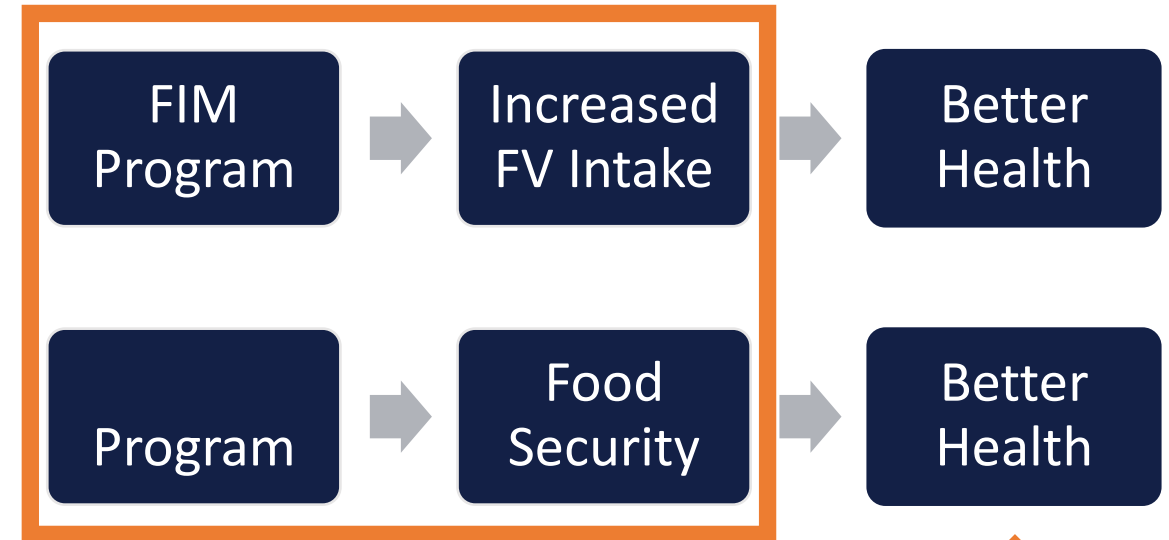
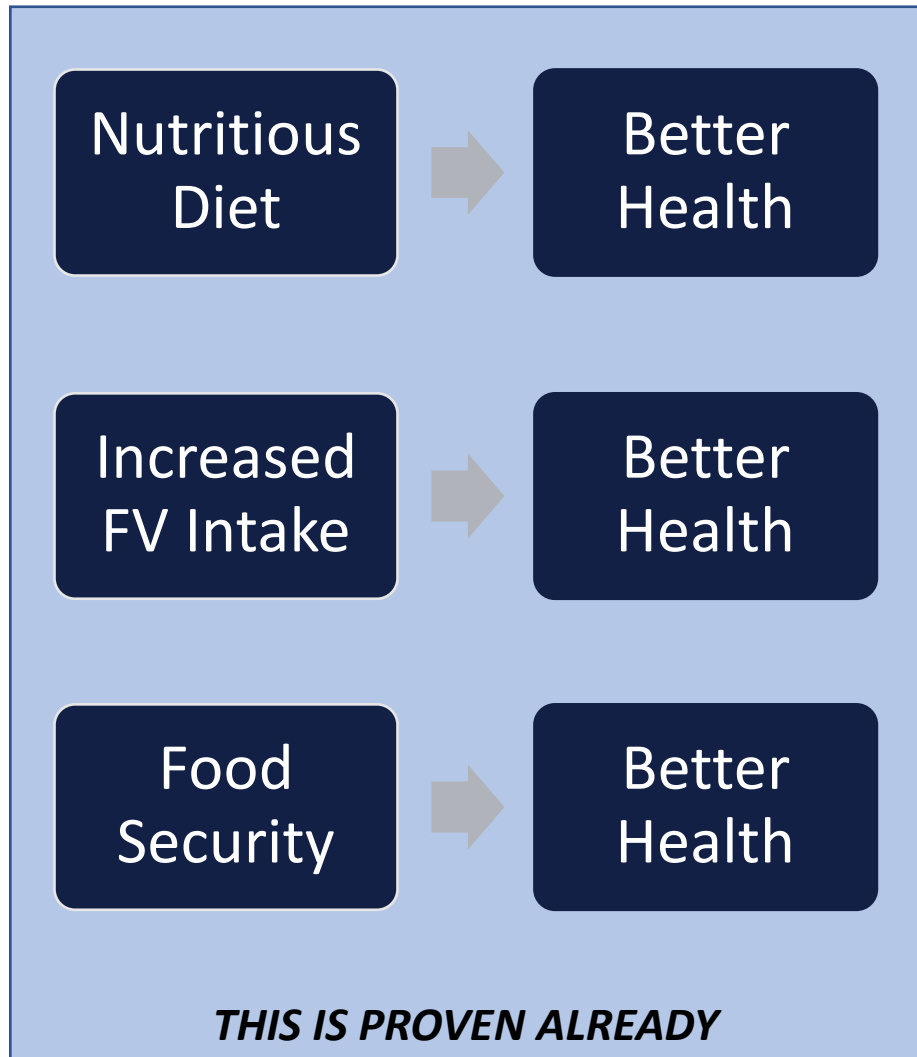


For more information, see "Cost-effectiveness of financial incentives for improving diet through Medicare and Medicaid: A microsimulation study" by Lee et al. (2019).
<https://doi.org/10.1371/journal.pmed.1002761>

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

Opportunities for *Individual Programs*

Controversy
Alert!



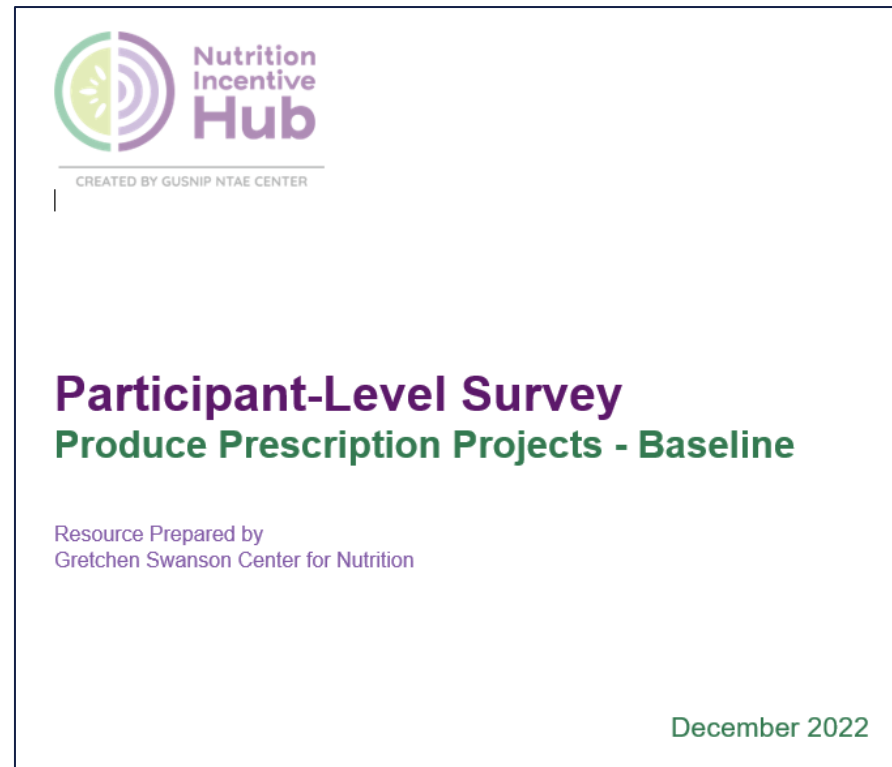
This will happen if:

- Implemented at scale
- Dose and duration are sufficient

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.

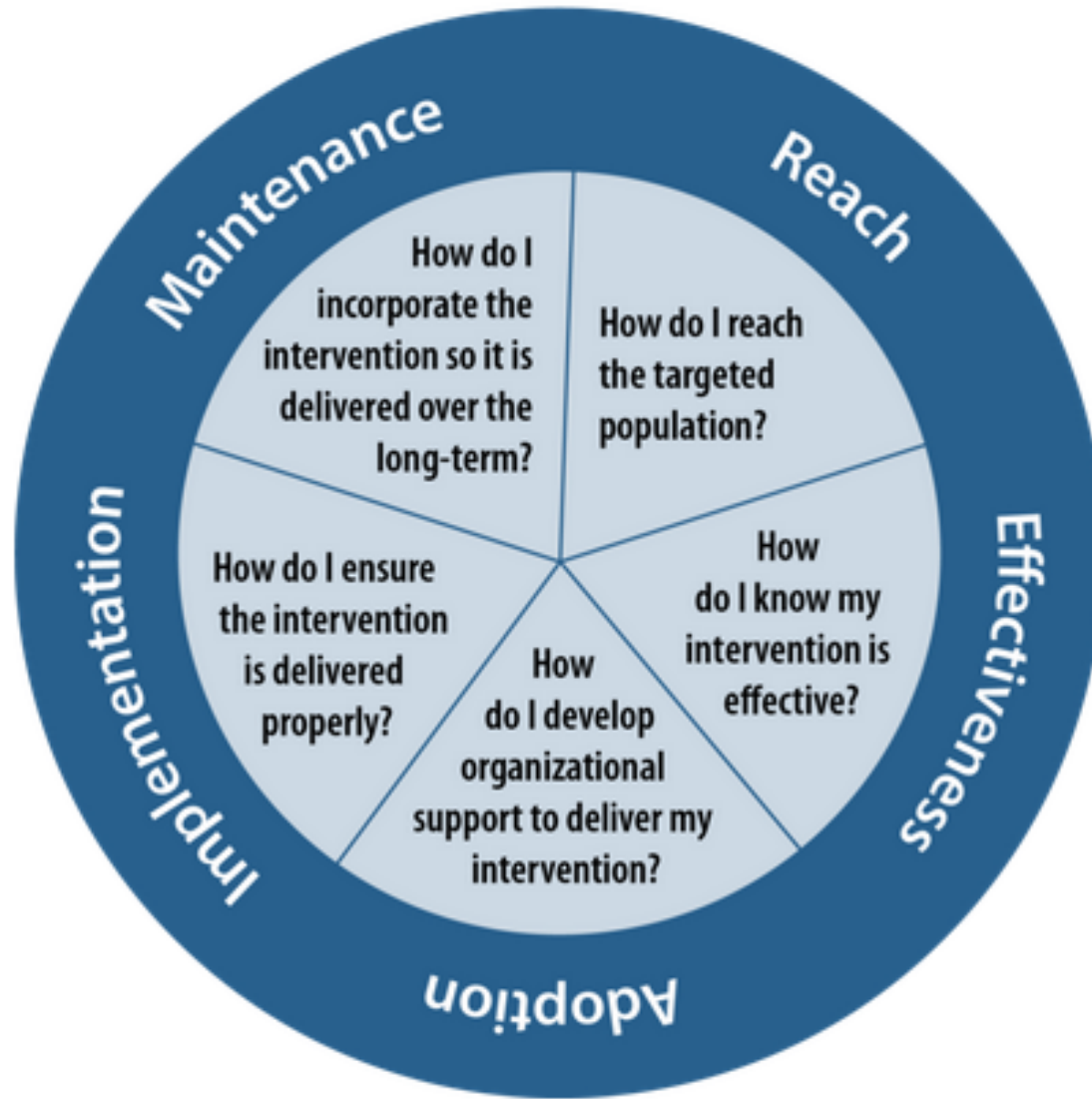
Shared metrics → pooled data →
More participants
More sites



- 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>

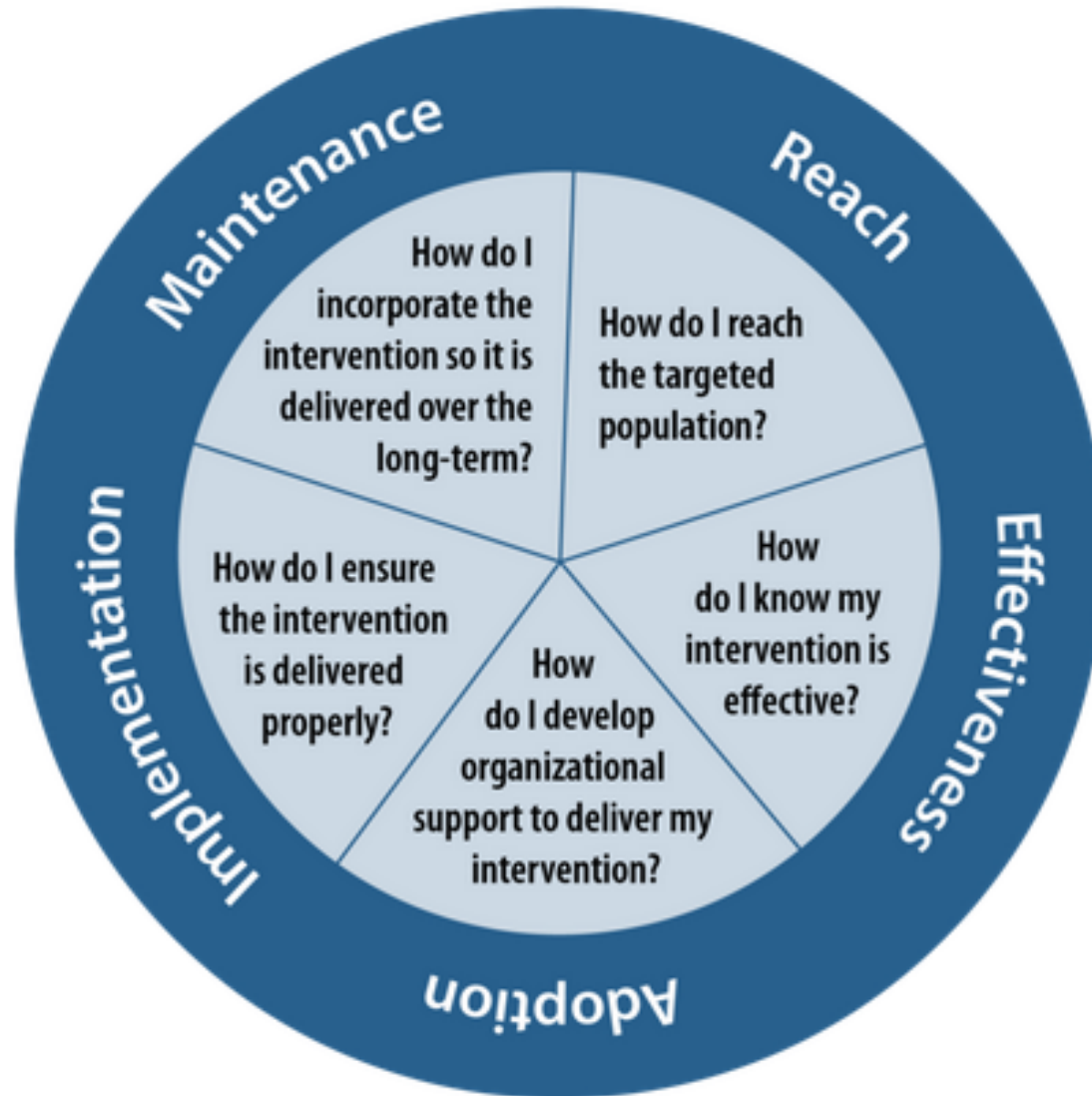
Elements of the RE-AIM Framework



Opportunities for Individual Programs: RE-AIM

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.

Elements of the RE-AIM Framework



Reach

1. How many people would ideally be served?
2. How many people are actually served?
3. Are those served representative of the target population?
4. Are individuals most at-risk among those who are reached?

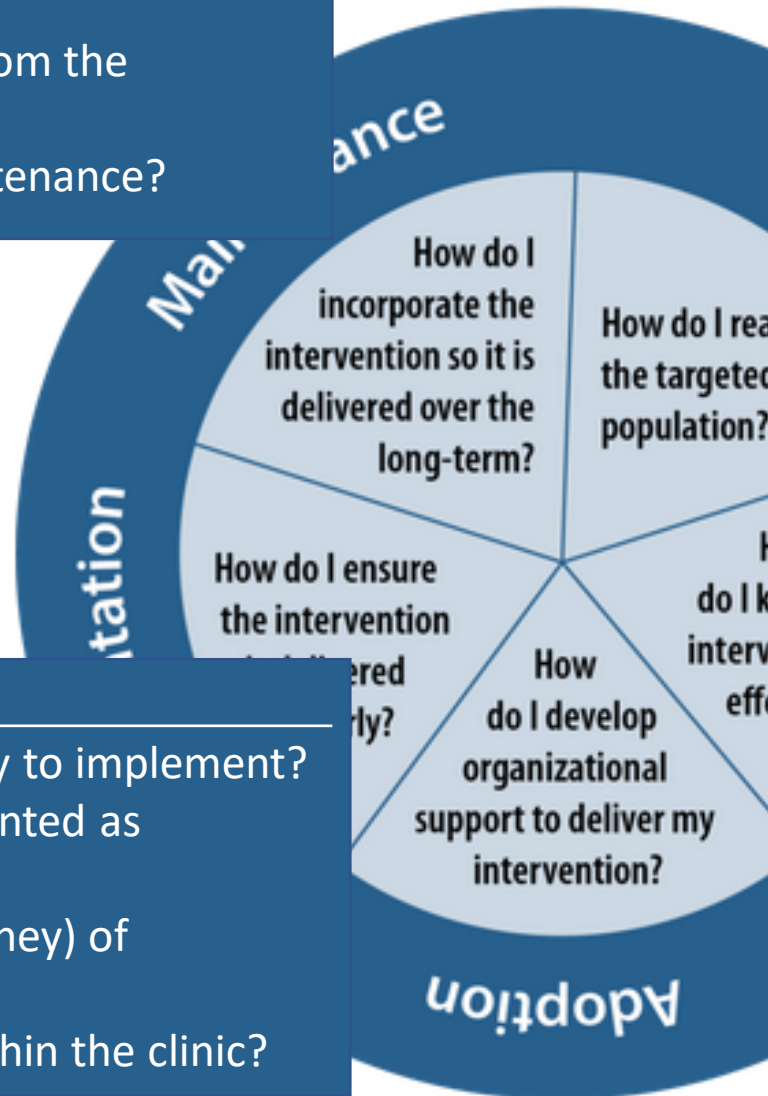
Effectiveness

1. Do you achieve the outcomes you intend?
Redemption rate? Satisfaction? FV intake?
Food security?
2. Are the outcomes consistent across sub-groups of the population?
3. Are there unanticipated consequences?
4. How confident are you that benefits outweigh any adverse consequences?

Adoption

1. How many clinics could participate?
2. How many clinics actually participated?
3. Are there differences between clinics that do and do not participate?

of the RE-AIM Framework



Maintenance

1. Are there lasting impacts?
2. Is there consistent support from the organizations involved?
3. Is funding adequate for maintenance?

Reach

1. How many people would ideally be served?
2. How many people are actually served?
3. Are those served representative of the target population?
4. Are individuals most at-risk among those who are reached?

Effectiveness

1. Do you achieve the outcomes you intend?
Redemption rate? Satisfaction? FV intake?
Food security?
2. Are the outcomes consistent across sub-groups of the population?
3. Are there unanticipated consequences?
4. How confident are you that benefits outweigh any adverse consequences?

Implementation

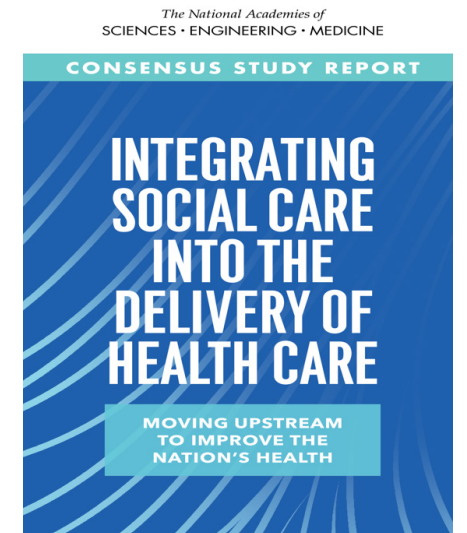
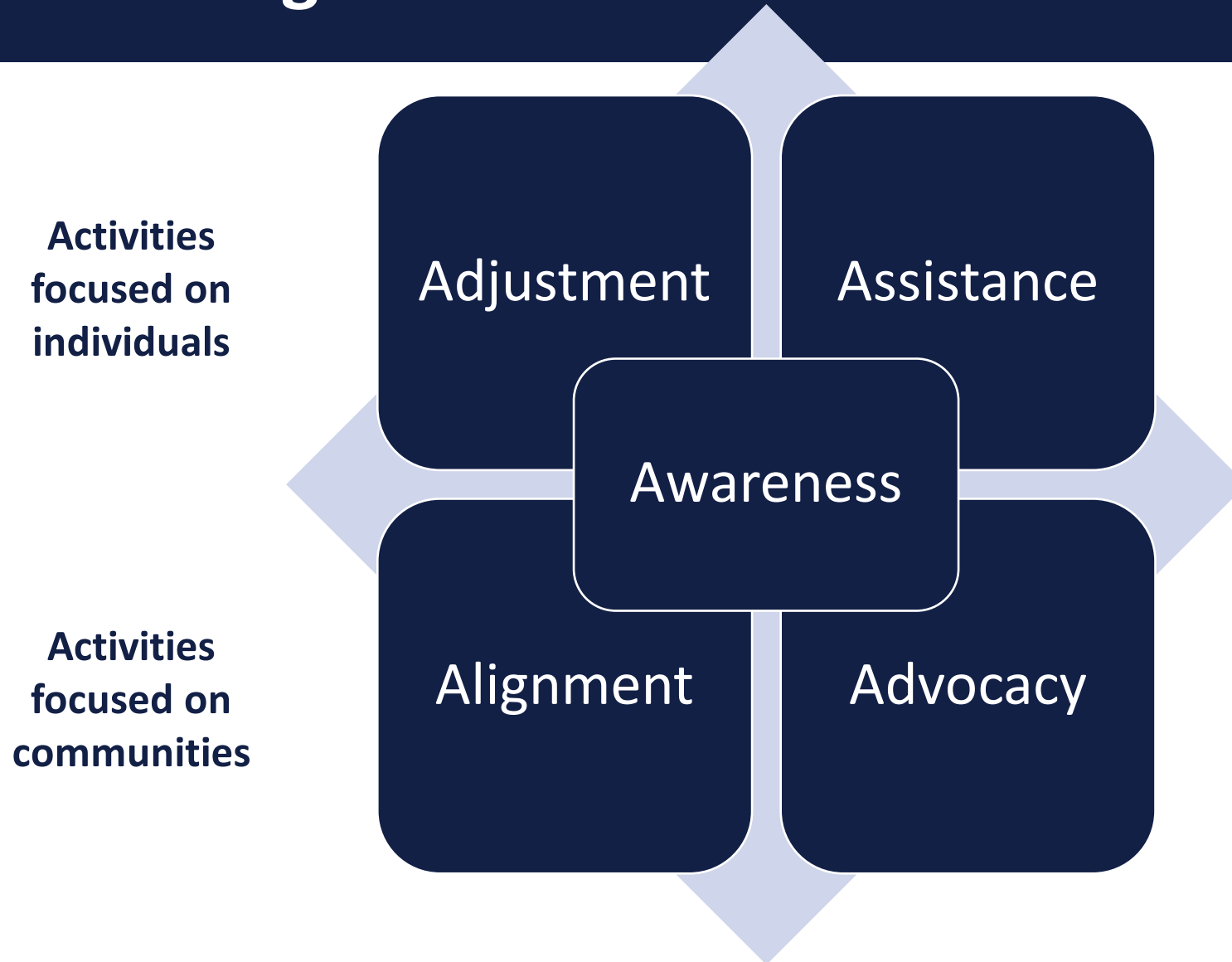
1. What activities are necessary to implement?
2. Are those activities implemented as intended?
3. What is the cost (time & money) of implementation?
4. What is the acceptability within the clinic?

Adoption

1. How many clinics could participate?
2. How many clinics actually participated?
3. Are there differences between clinics that do and do not participate?

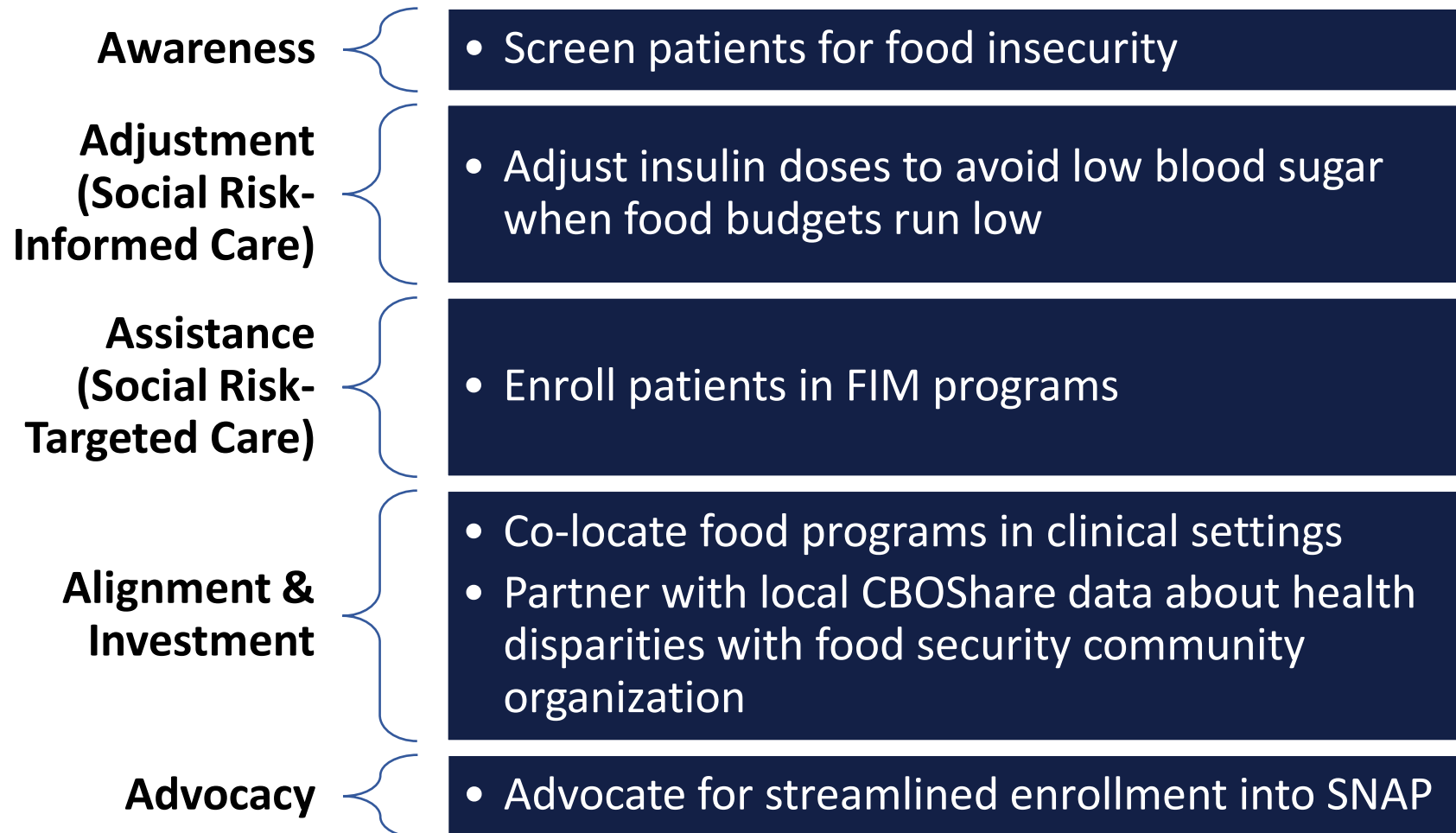


NASEM Health Care System Activities that Strengthen Social Care Integration: 5 A's



A Vision for the Future

5 A's for Food Security



Adapted from: SIREN (Laura Gottlieb)

Conclusions

- WIC is already **proven**
 - Scalable
 - Positive impact on health outcomes
- 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
 - Examine all elements of the RE-AIM framework, not just effectiveness
 - For effectiveness: consider food security, dietary intake, satisfaction, and redemption rate
 - Use the same metrics others are using
 - We need (and are awaiting)
 - The large, rigorously conducted trial
 - Implementation science approaches to establish best practices

Want to learn more about NOPREN
or join the network?

Visit <https://nopren.ucsf.edu>

OR

Contact NOPREN@ucsf.edu

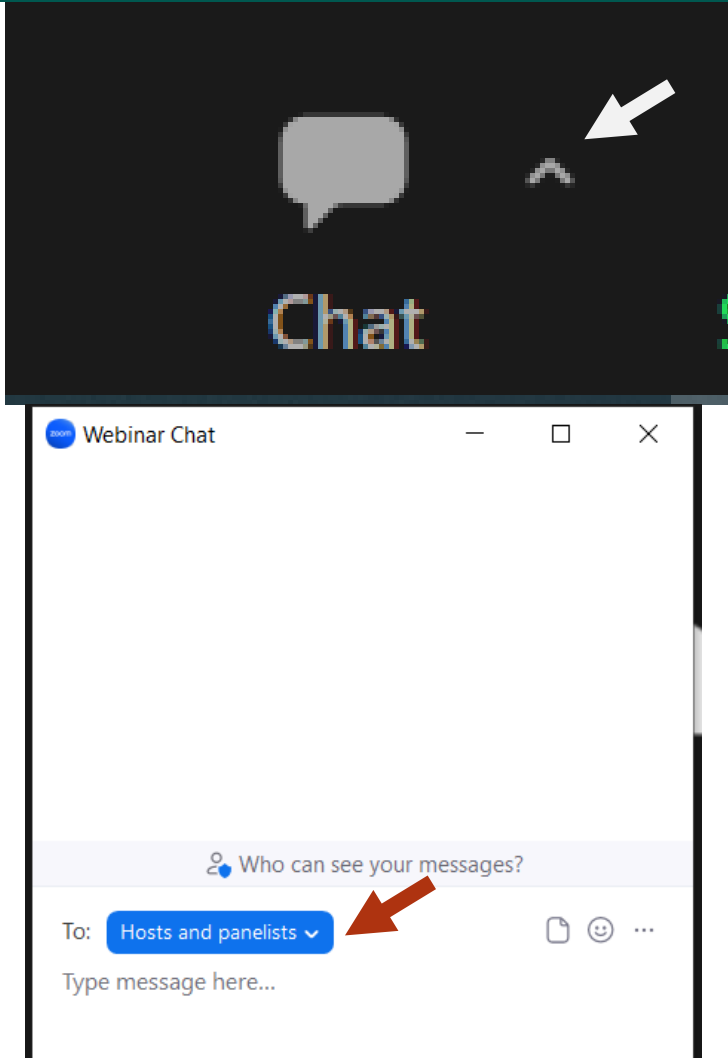
Prevention in Focus Webinar Series

SAVE THE DATE!

August 17, 2023
11 am – 12 noon EST

Webinar Topic = Midwifery

Prevention in Focus Webinar Series



Q&A Session

**Please send us your questions
via the **Chat pod** directed to
Hosts and Panelists**



Thank You!

See you for our next webinar
on August 17th!



prevention.nih.gov/PreventionInFocus



PreventionInFocus@nih.gov



[@NIHprevents](https://twitter.com/NIHprevents)