

# Optimizing Care for Patients Experiencing Food Insecurity

**Hilary Seligman MD MAS**

Professor of Medicine and of Epidemiology & Biostatistics, UCSF  
Director, CDC's Nutrition and Obesity Policy Research and Evaluation Network

June 8, 2023



National Clinician  
Scholars Program



UCSF Center for Vulnerable Populations  
Zuckerberg San Francisco General Hospital

# I have no commercial conflicts of interest to disclose.

Opinions expressed in this presentation are my own and do not necessarily reflect the opinions of NIH, CDC, USDA, or Feeding America.



CR is a 44 yo woman with DM2. She presents for routine care. She has no complaints. Her last HbA1c was 8.1%. In your 5 years taking care of her, her HbA1c has never been  $<7.9\%$ . In her glucose log, her AM blood sugars are generally in the 200's, but she has numerous values between 48 and 62 since your last clinic visit. BMI today is 28.

DM Meds: long-acting insulin qhs, glyburide, MTF

SH: 3 teenaged children, works as a housecleaner



# Objectives

- Examine the rationale and strategy for screening for food insecurity in the clinical setting
- Adjust diabetes management, where appropriate, to accommodate unreliable or inconsistent access to food
- Differentiate between social determinants of health and social needs

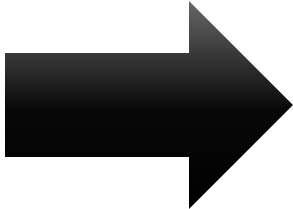


# Hunger

- The uneasy or painful sensation caused by a lack of food, or the recurrent and involuntary lack of access to food. (LSRO)



# Coping Strategies to *Avoid* Hunger

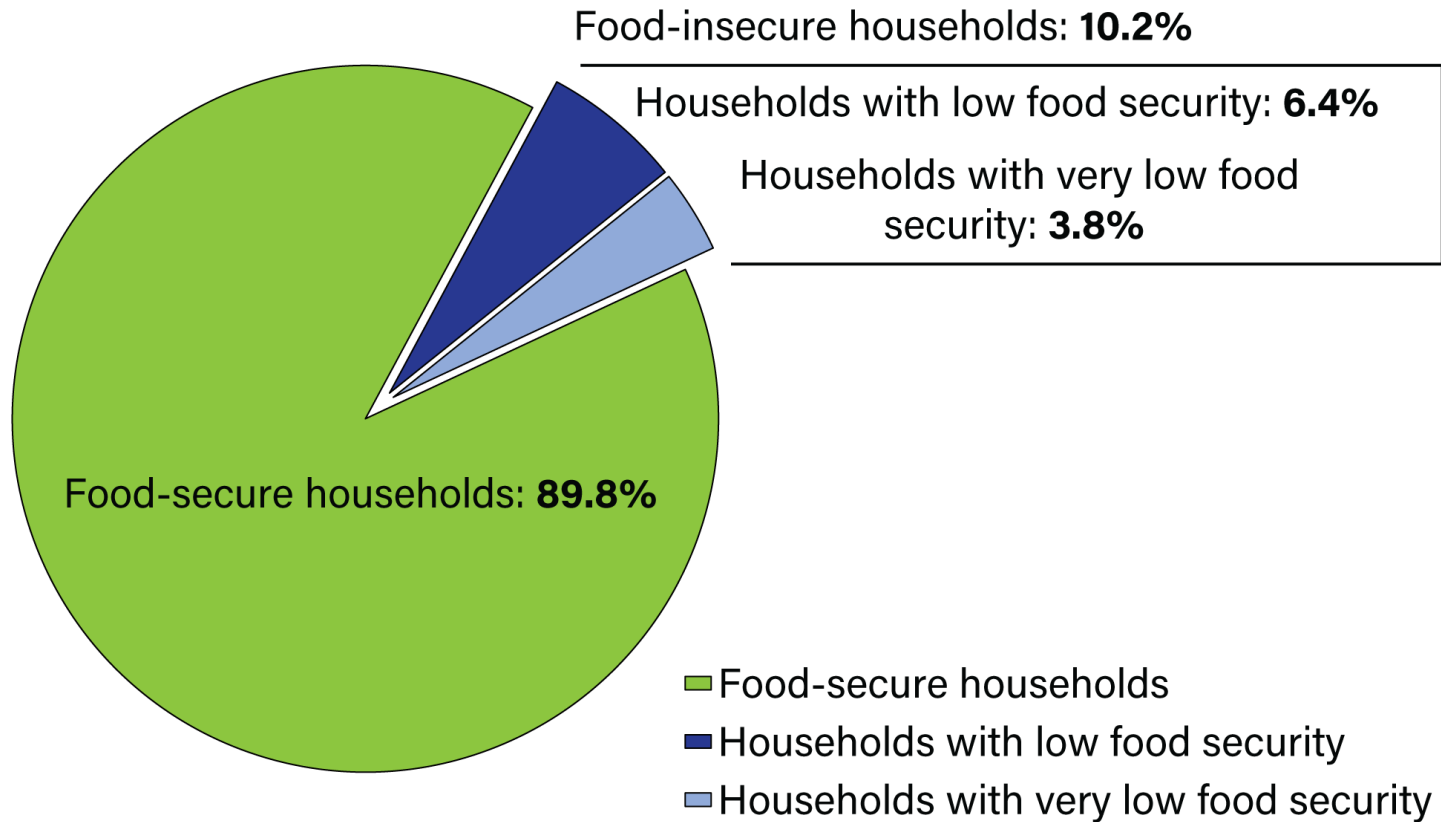
- Eating low-cost foods
    - Fewer F&V
    - More fats/carbs
  - Eating highly filling foods
  - Small variety of foods
  - Avoiding food waste
  - Binging when food is available
- 
- Higher risk of obesity, diabetes, & other chronic, diet-sensitive disease
  - Once you are chronically ill, poorer ability to manage it your illness

- Food security:  
Access by all people at all times to enough food for an active, healthy life
- Food insecurity:  
Household-level economic and social condition of limited or uncertain access to adequate food



# 1 in 10 US Households Food Insecure in 2021

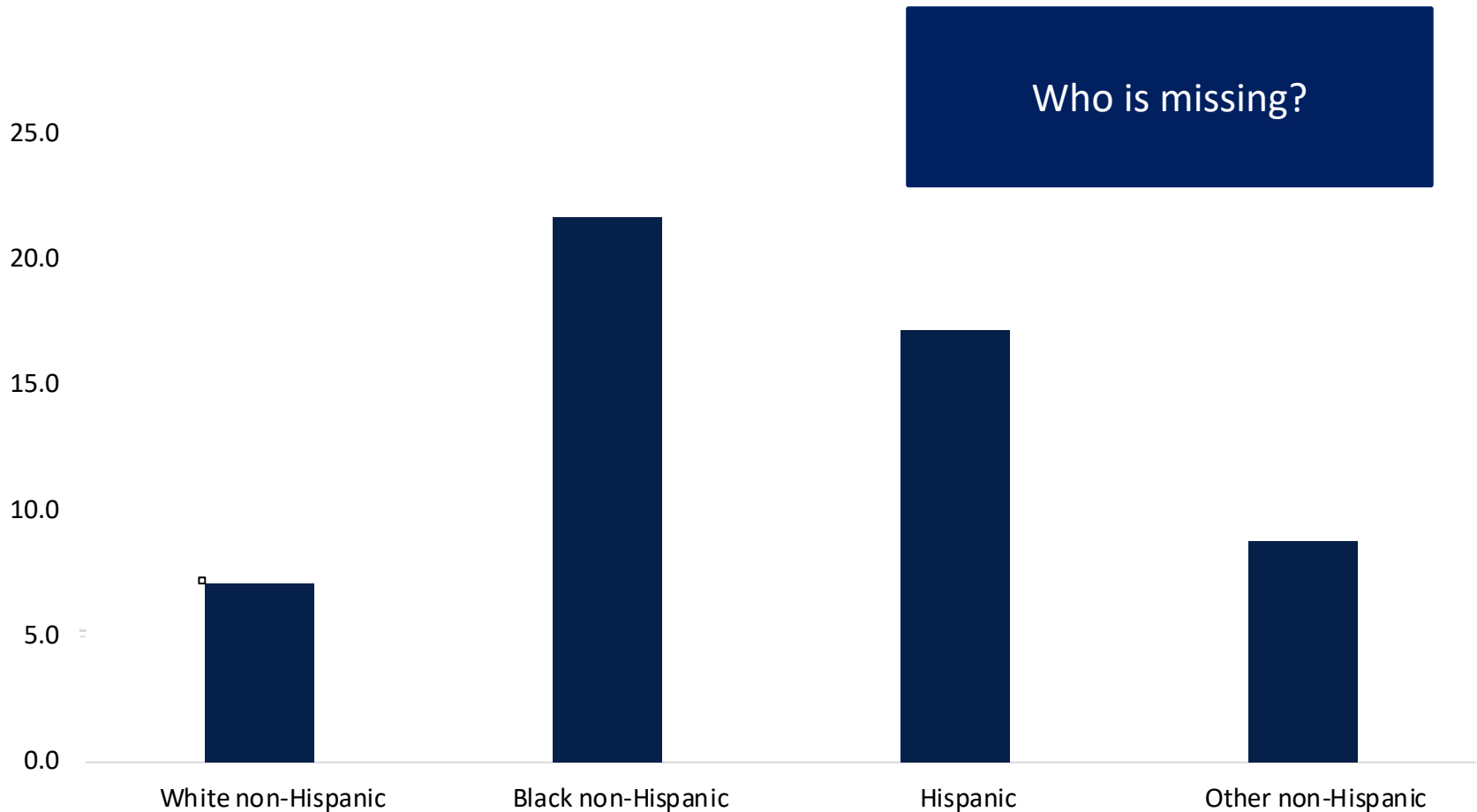
**U.S. households by food security status, 2021**



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



# Disparities in Food Insecurity Rates by Race, 2020

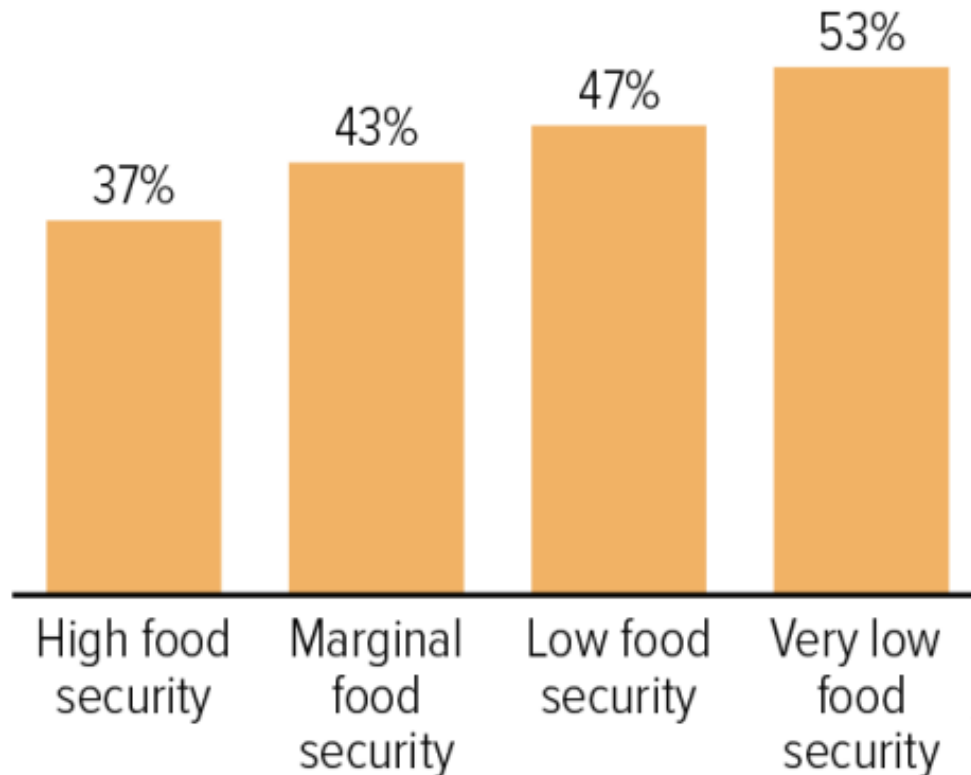


Source: USDA, Economic Research Service, using data from the December 2020 Current Population Survey Food Security Supplement, U.S. Census Bureau

FIGURE 1

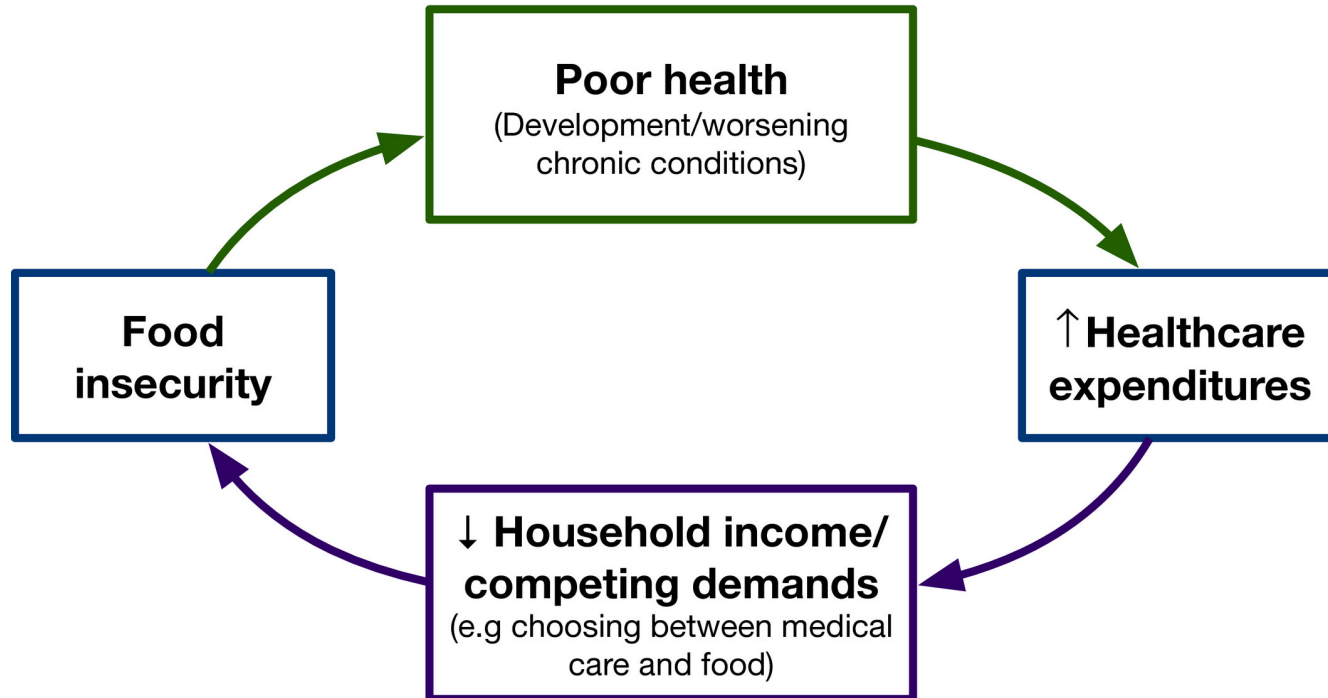
## Adults in Households with Less Food Security Are Likelier to Have a Chronic Illness

Probability of any chronic illness

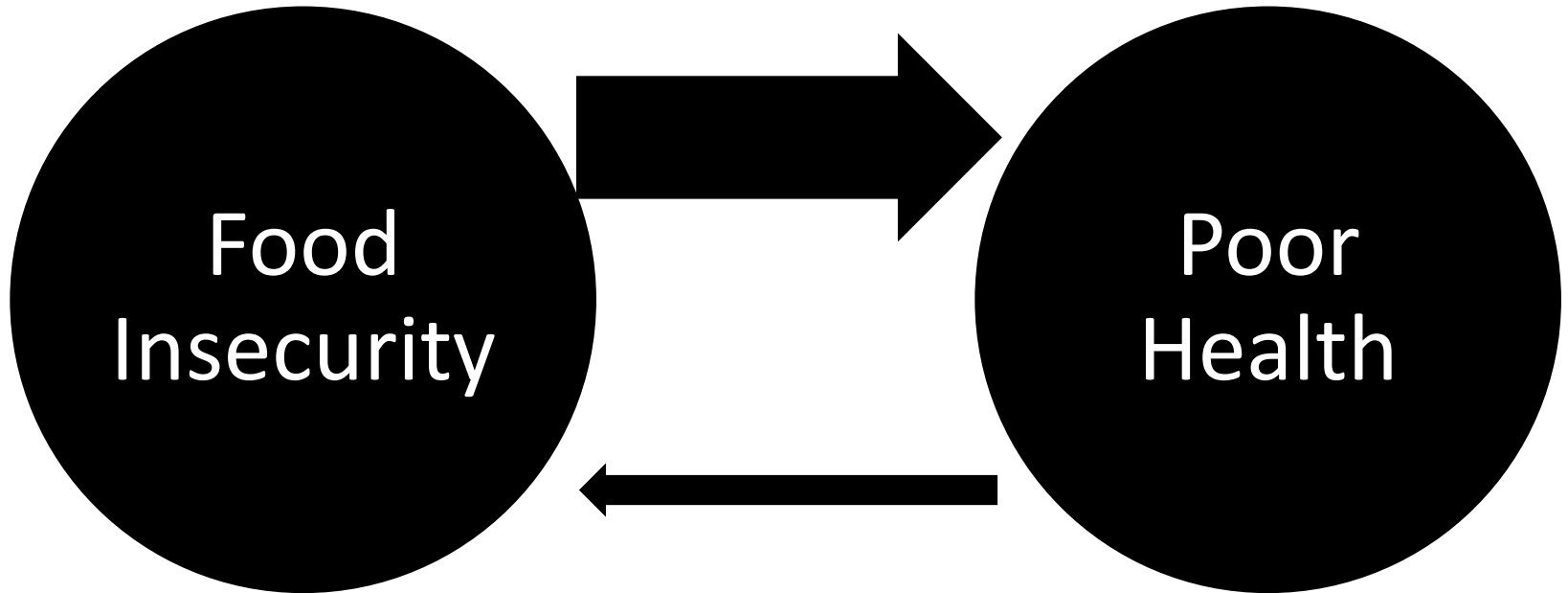


Source: Christian A. Gregory and Alisha Coleman-Jensen, "Food Insecurity, Chronic Disease, and Health Among Working-Age Adults," U.S. Department of Agriculture, July 2017. Adjusted for differences in demographic, socioeconomic and other characteristics. Sample includes working-age adults in households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

# Bidirectional relationship between food insecurity and poor health

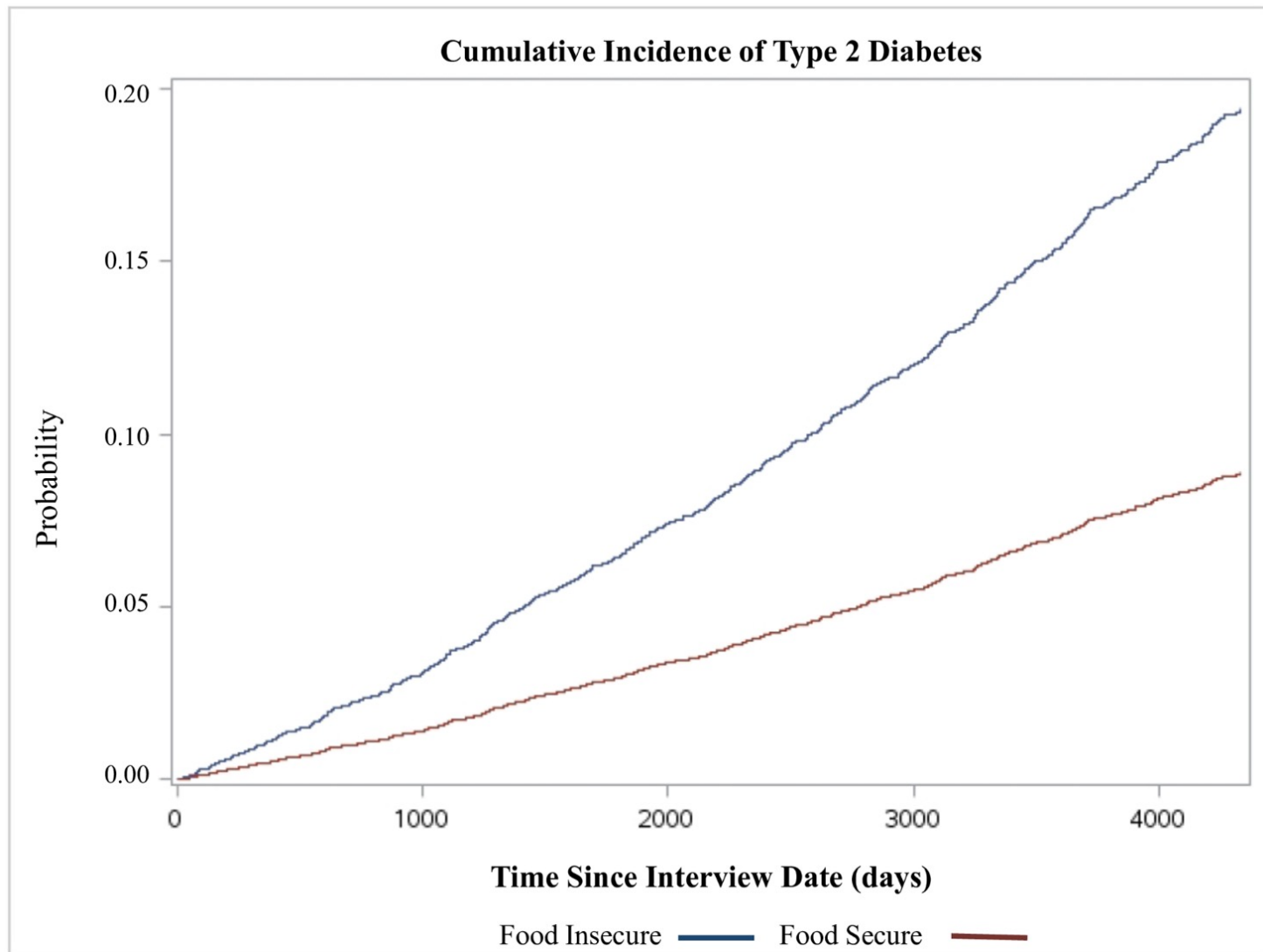


# Bidirectional relationship between food insecurity and poor health

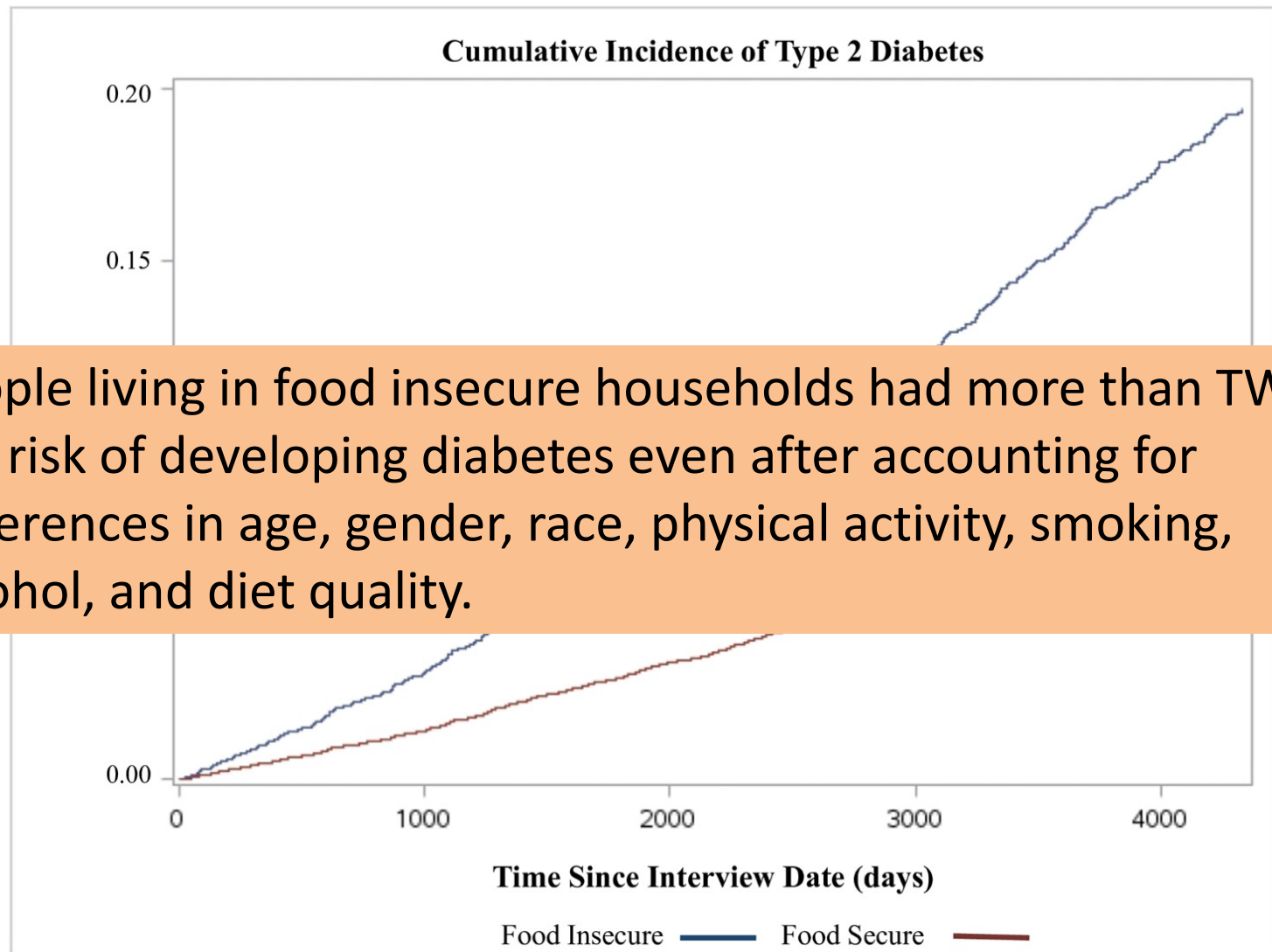


Johnson, Palakshappa, et al. Health Services Research, 2021.

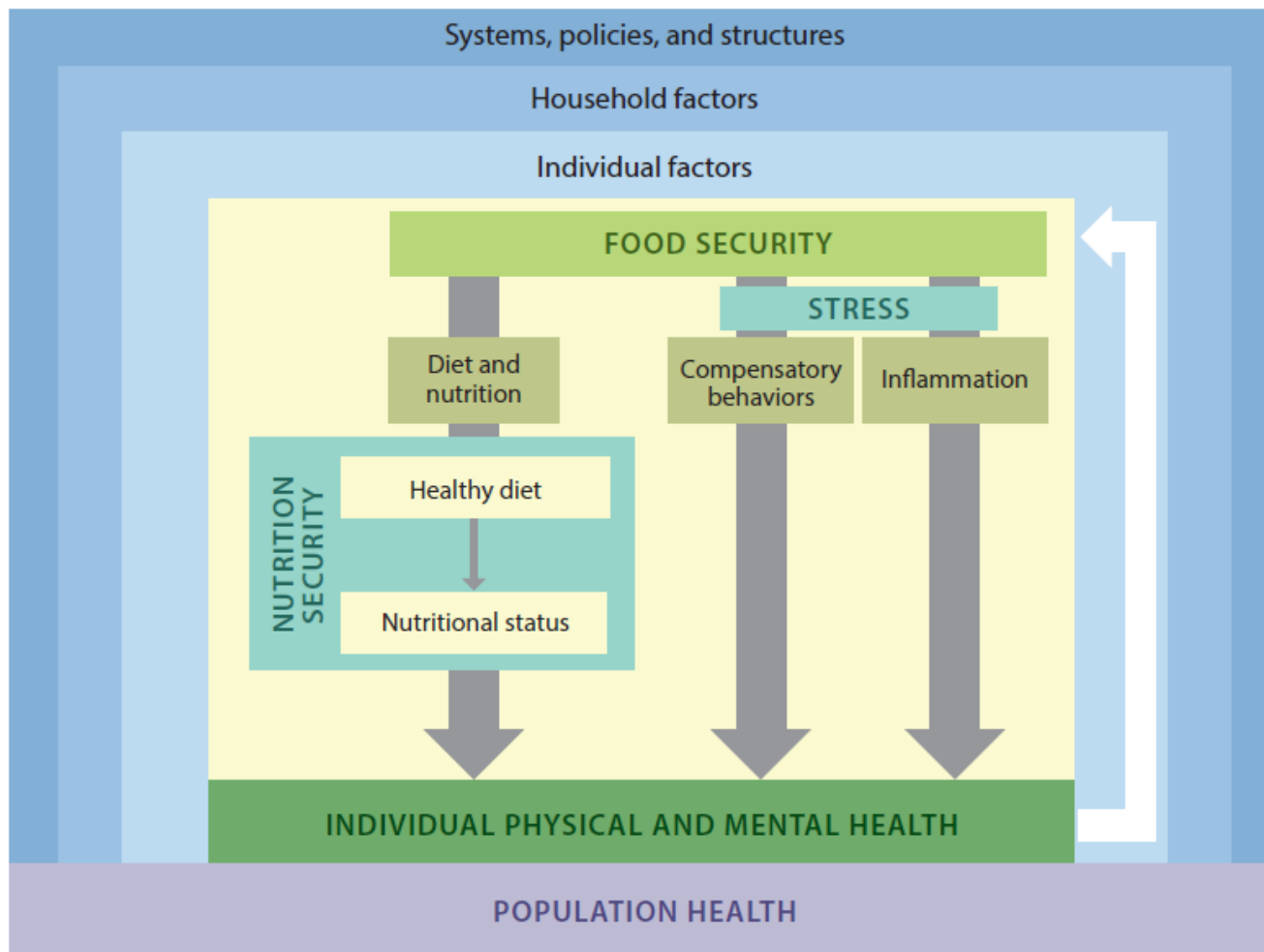
# Food Insecurity → Poor Health



# Food Insecurity → Poor Health



People living in food insecure households had more than TWICE the risk of developing diabetes even after accounting for differences in age, gender, race, physical activity, smoking, alcohol, and diet quality.



**Figure 1**

A proposed conceptual framework for exploring food security and nutrition security and their impacts on health.

[\*\*Assessing and Monitoring Nutrition Security to Promote Healthy Dietary Intake and Outcomes in the United States.\*\*](#)

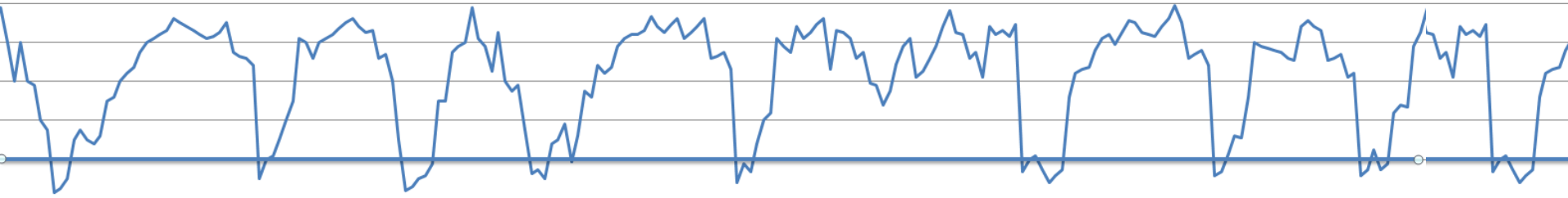
Hilary K. Seligman, Ronli Levi, Victoria O. Adebisi, Alisha Coleman-Jensen, Joanne F. Guthrie, and Edward A. Frongillo.

*Annual Review of Nutrition.*

Vol. 43, 2023

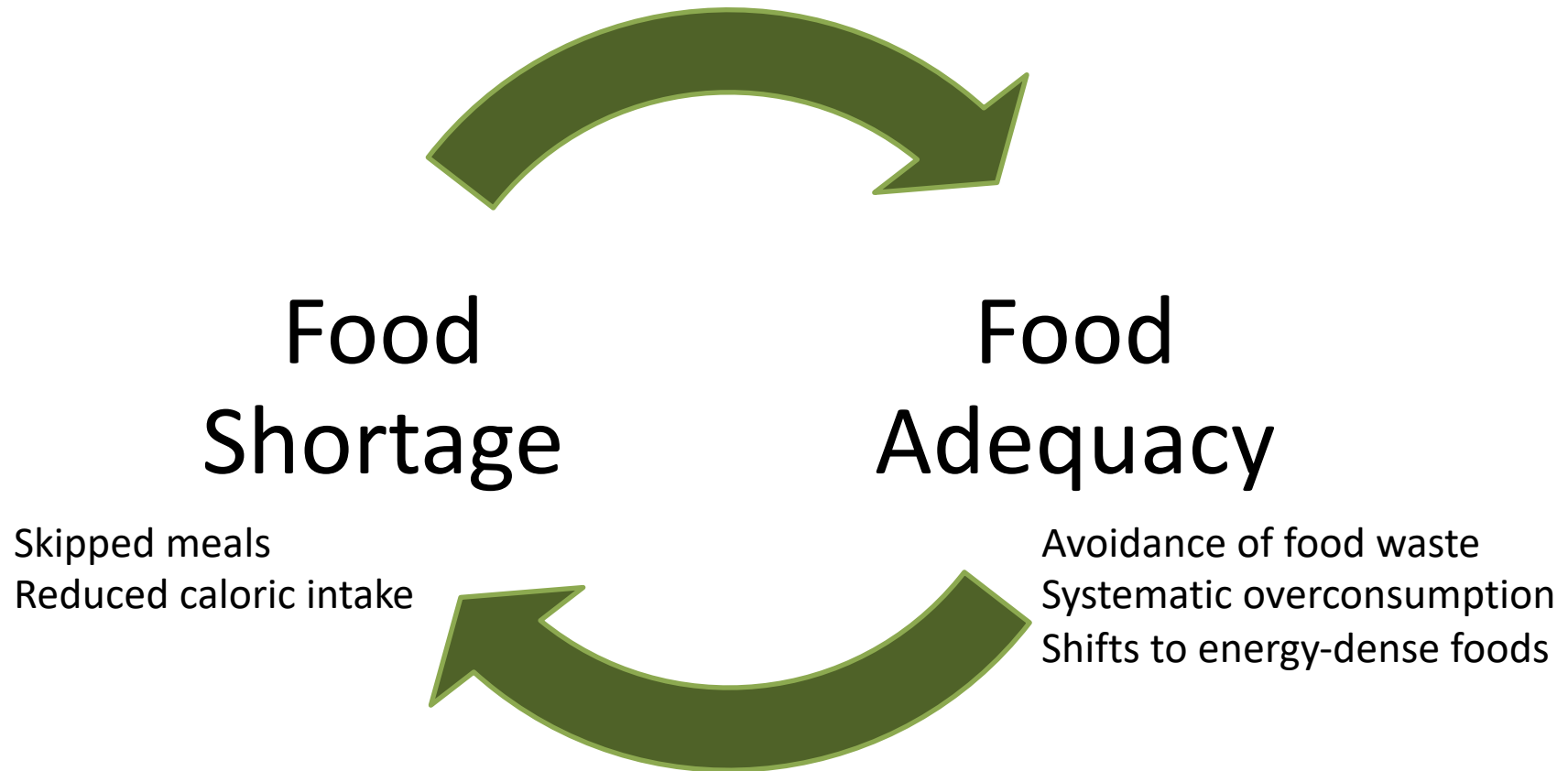
# Food Insecurity is Cyclic & Episodic

- Variation is monthly, seasonal, & random
- Average 7 episodes per year
- Dietary intake fluctuates, particularly among mothers

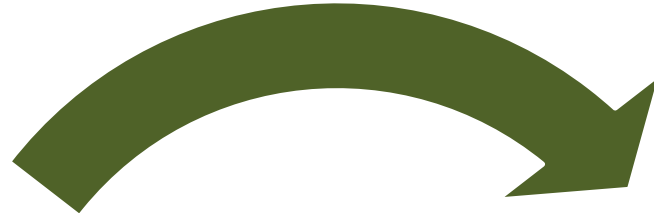




# Compensatory Strategies



# Diabetes is the Most Challenging Condition to Manage Clinically in the Context of Food Insecurity



Food  
Shortage

Food  
Adequacy

Skipped meals  
Reduced caloric intake

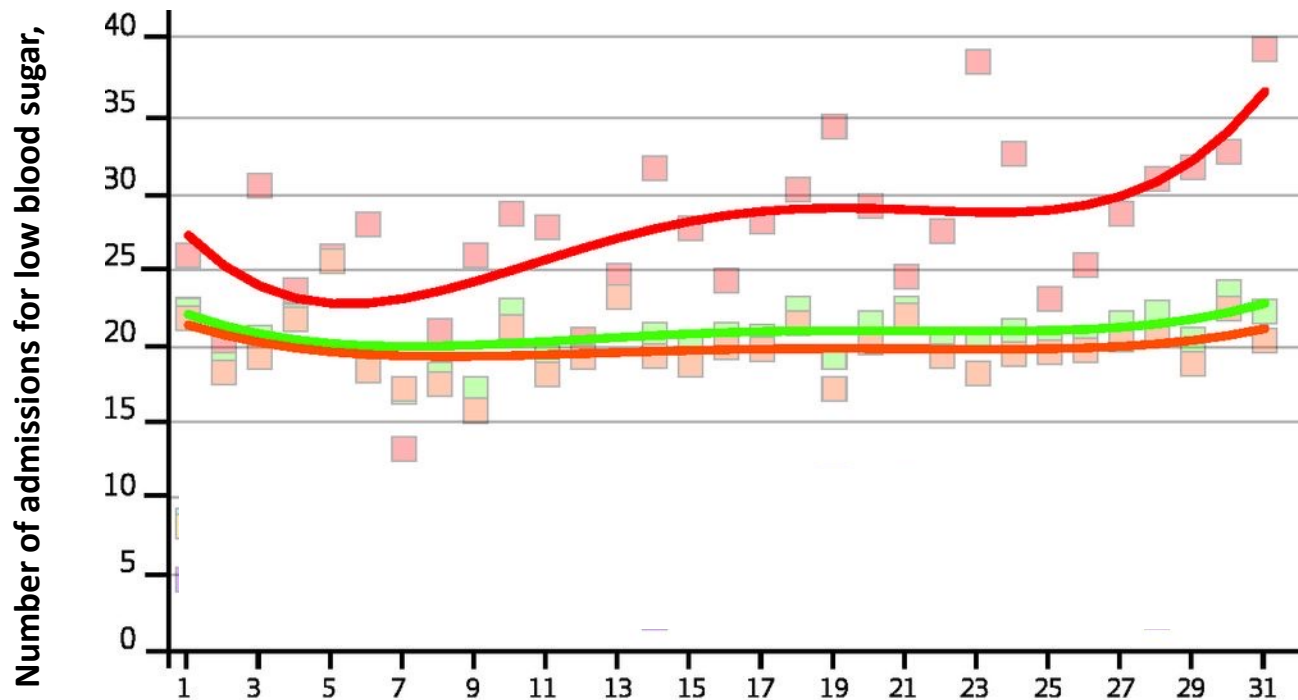
Avoidance of food waste  
Systematic overconsumption  
Shifts to energy-dense foods



**HYPOGLYCEMIA**

**HYPERGLYCEMIA**

# Admissions for Low Blood Sugar Increase by 27% in Last Week of the Month for Low-Income Population



# Food Insecure Adults with Diabetes Have Higher Average Blood Sugars

	Food Secure	Food Insecure	
<b>HbA1c &gt;7%</b> (NHANES, known diabetics <200% FPL)	49%	70%	Adjusted RR 1.35 (1.05-1.74)
<b>Mean HbA1c (ICHHC, n=711)</b>	8.1%	8.5%	p=0.007
<b>Mean HbA1c (MFFH, n=621)</b>	8.0%	8.4%	p=0.01

Seligman, *Jl Nutrition*, 2010; Seligman, *Diabetes Care*, 2012; Lyles, *Diabetes Care*, 2013.

# Clinical Implications for Food Insecure Patients with Diabetes

- In the setting of frequent/severe hypoglycemia:
  - Before you liberalize glycemic targets, screen for food insecurity
- Medication: prioritize those with low hypoglycemia risk
  - Metformin, if clinically appropriate
  - If using long-acting insulin: dose low using a peakless analog (e.g., glargine)
  - If using short-acting insulin: OK to use immediately after meal if meals are unreliable
- Prescribe glucose tabs
- Smoking cessation & substance abuse counseling
- Talk about “a day in which you can’t eat” rather than a “sick day”

# Dietary Counseling

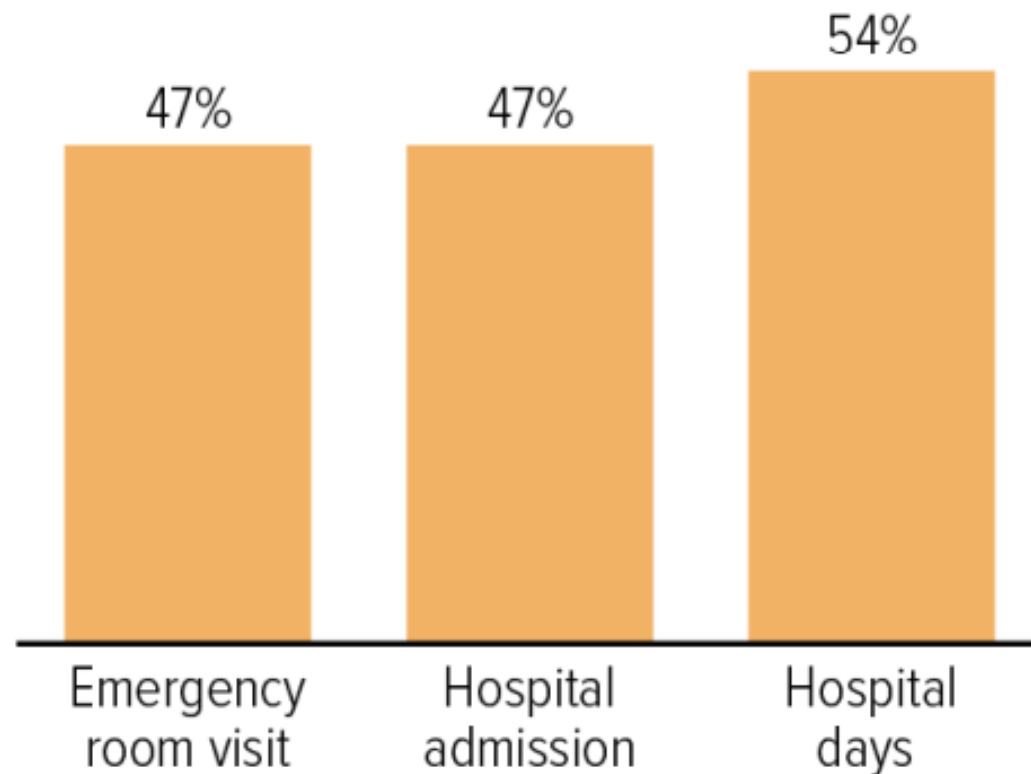
- DSME sensitive to needs of food insecure patients
- **Stress portion control rather than dietary substitutions**
- Frozen vegetables
- Farmers' markets
- Nutritionist referral



FIGURE 4

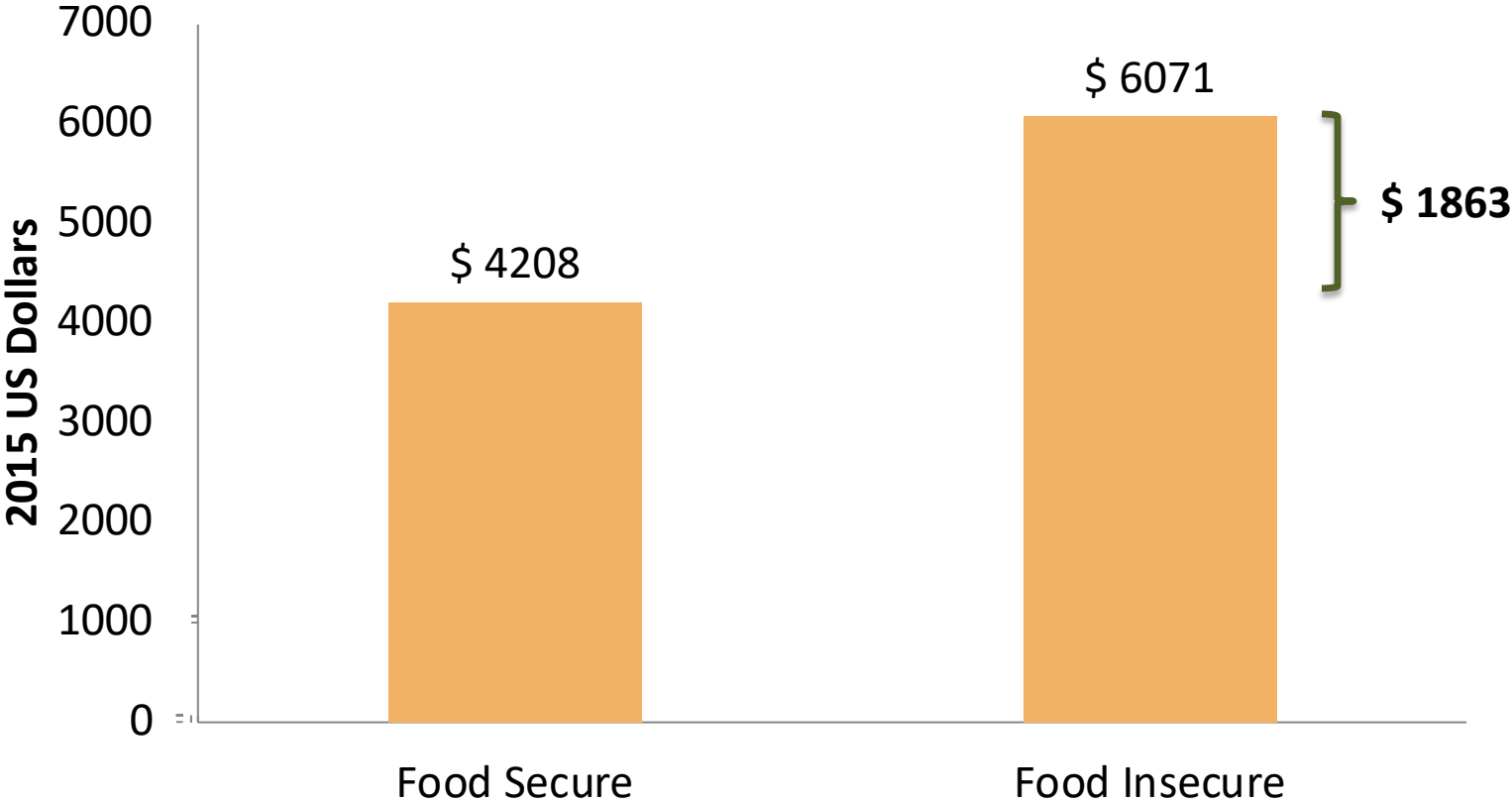
## Adults in Food-Insecure Households Have More Emergency Room Visits and Hospital Admissions

Percent more likely relative to food-secure households



Berkowitz, Seligman, and Basu. JAMA Int Med, 2018.

# Food Insecurity Associated with 44% Increase in Annual Health Care Expenditures



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



If my clinic helps a patient  
become more food secure,  
will it make a difference in their  
health?





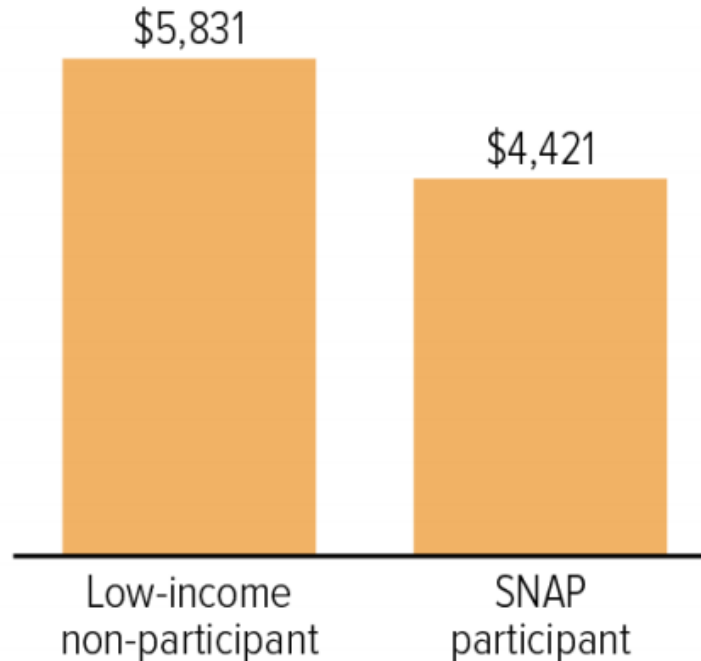
**reduces food  
insecurity by 20-30%**



FIGURE 10

## A SNAP Participant Incurs \$1,400 Less for Health Care

Estimated annual per-person health care spending



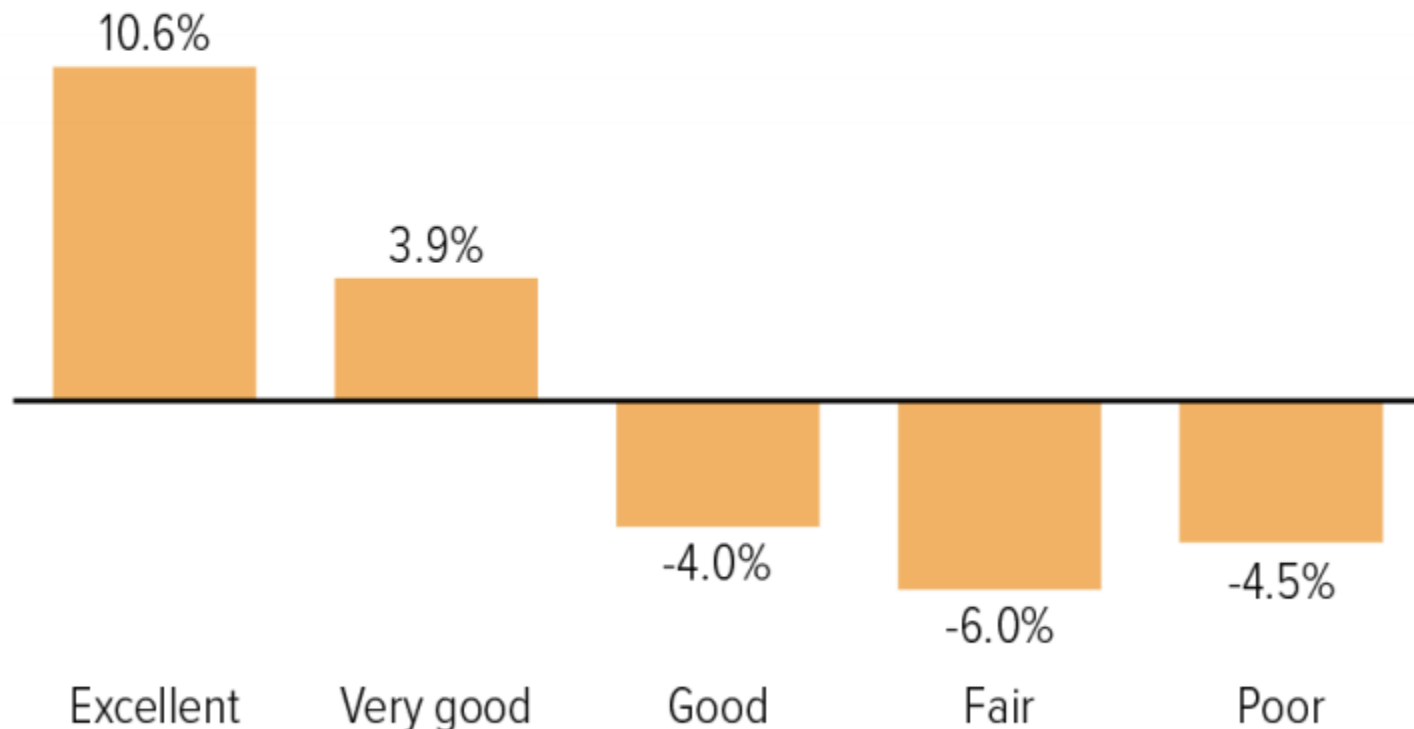
Note: Health care spending includes out-of-pocket expenses and costs paid by private and public insurance, including Medicare and Medicaid.

Source: Seth Berkowitz, Hilary K., Seligman, and Sanjay Basu, "Impact of Food Insecurity and SNAP Participation on Healthcare Utilization and Expenditures," University of Kentucky Center for Poverty Research, 2017.

FIGURE 6

## SNAP Participants Report Better Health Than Eligible Non-Participants

Percent more or less likely to describe health as:

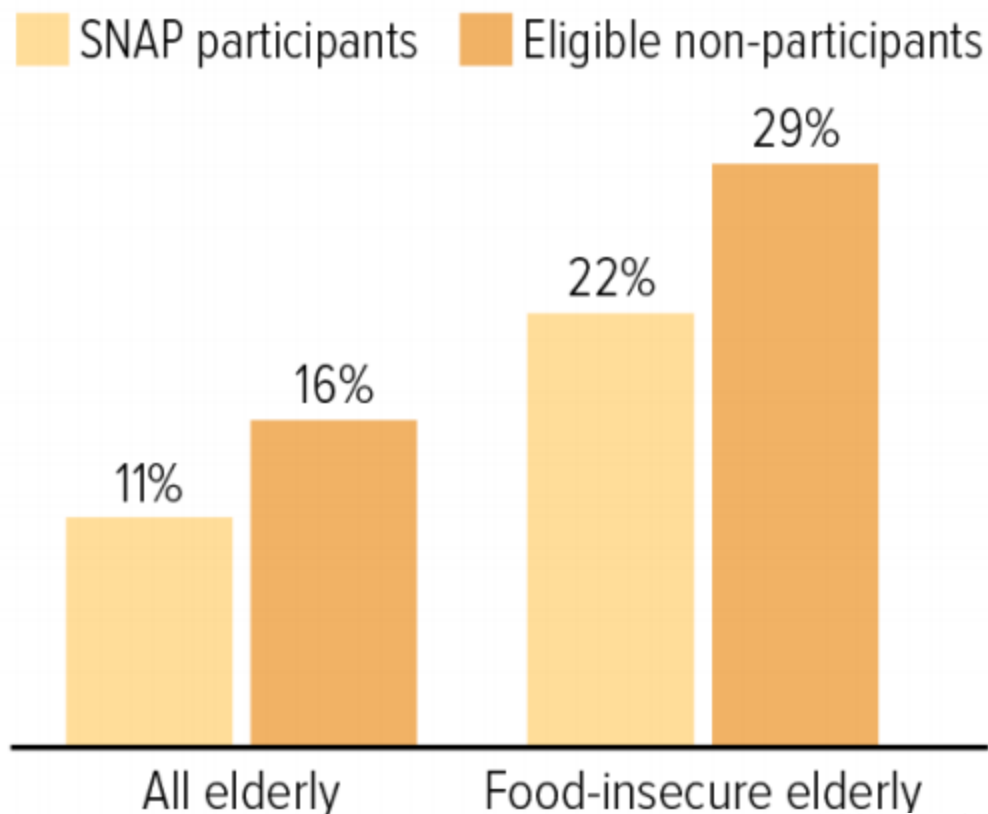


Source: Christian A. Gregory and Partha Deb, "Does SNAP Improve Your Health?" Food Policy, 2015. Adjusted for differences in demographic, socioeconomic and other characteristics. Sample includes adults aged 20 to 64 in households with income at or below 130% of the federal poverty level.

FIGURE 8

## Elderly SNAP Participants Less Likely to Skip Needed Medications

Percent who skip or stop medications, take smaller doses, or delay a prescription due to cost



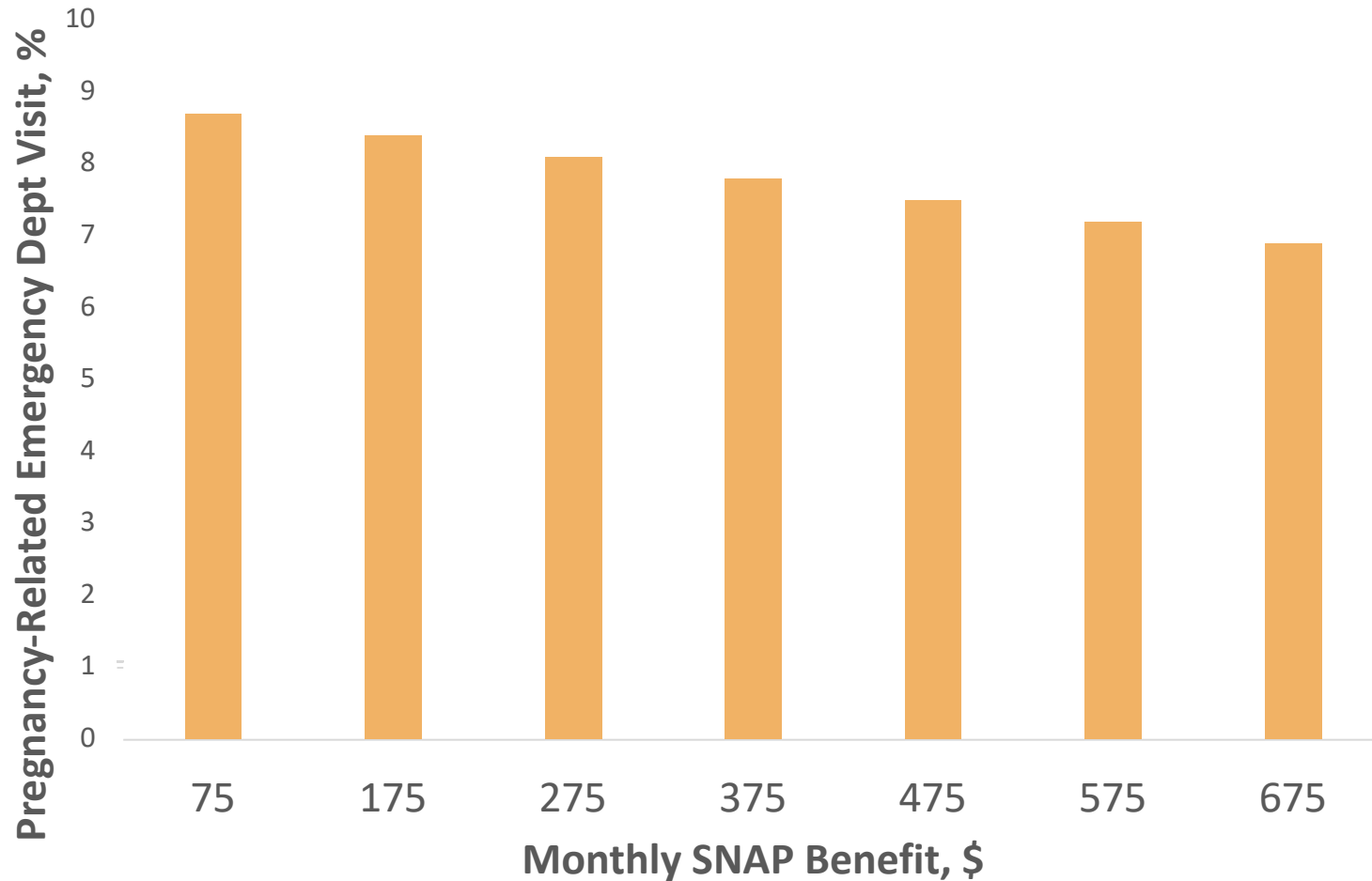
Source: Mithuna Srinivasan and Jennifer A. Pooler, "Cost-Related Medication Nonadherence for Older Adults Participating in SNAP, 2013–2015." *American Journal of Public Health*, December 2017

# SNAP & Impact on Health Outcomes

- Less hypoglycemia at end of month
- Fewer pregnancy-related ER visits
- Fewer child ER visits for asthma
- Fewer adult ER visits for HTN
- Fewer hospitalizations and shorter length-of-stay
- Lower health care expenditures



# Higher Benefits Associated with Better Outcomes



# “Screen and Intervene”

Identification  
of food  
insecurity by  
positive  
clinical screen



Referral to  
someone who  
can make a  
connection to  
a program



Enrollment in  
on-site,  
community, or  
federal food  
program



Improved diet  
quality, food  
security, and  
clinical  
satisfaction



Improvement  
of health and  
utilization  
outcomes

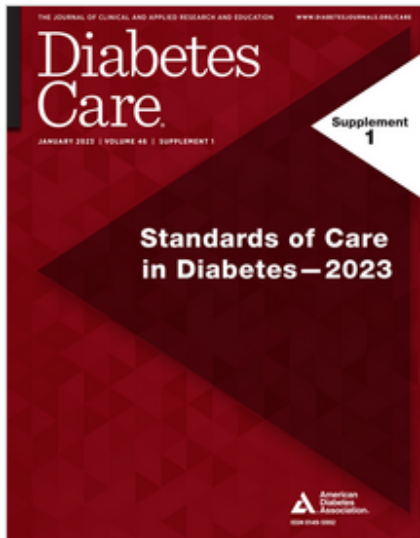




# Standards of Care in Diabetes – 2023 recommends food insecurity screening

Volume 46, Issue  
Supplement\_1

January 2023



[< Previous Article](#)

[Next Article >](#)

**Article Contents**

## Tailoring Treatment for Social Context

### Recommendations

**1.5** Assess food insecurity, housing insecurity/homelessness, financial barriers, and social capital/social community support to inform treatment decisions, with referral to appropriate local community resources. **A**

# Standardized Clinical Measurement: Hunger Vital Sign

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

Often or sometimes true to EITHER question suggests food insecurity (97% sensitivity, 83% specificity)

For test characteristics among households with children: Hager, Pediatrics, 2010

For test characteristics among households without children, population-based:

Gundersen & Seligman, PHN, 2017

# Best Practices in HVS Administration

- “I ask all of my patients about access to food. I want to make sure you know all of the community resources available to you. Many of them are free of charge.”
  - Stigma, “neglect”
- Medical provider should follow up on a +HVS, but may not be the best person to administer HVS
- “Would you like help with accessing food or resources for food **today**?”
- Frequency
  - Screen everyone once
  - Screen high-risk populations regularly: FI is dynamic!

# Food Is Medicine

- Integration of specific food and nutrition interventions in, or in close collaboration with, the health care system
  - Medically-Tailored Meals
  - Medically-Tailored Groceries
  - Produce Prescriptions
  - On-site interventions
- Target population: individuals with or at high risk for serious health conditions
  - Often prioritizes people with or at high risk of food insecurity

Clinical Screen  
for Food  
Insecurity

“On-Site”  
Programs

Community  
Programs

Federal Nutrition  
Programs

Food pantry in  
clinic

MTM’s/MTG’s

SNAP

Mobile food  
distribution in  
clinic

Food Bank/  
Food Pantry

WIC

SNAP enrollment  
assistance

Produce  
Prescriptions

Numerous  
Others

**Food Is  
Medicine**

# DC Programs

\$\$\$\$

\$



## Medically Tailored Meals Programs

Home-delivered meals tailored to dietary needs of specific illnesses  
*Food & Friends, Mom's Meals*



## Medically Tailored Food Programs

Food or groceries tailored to specific illnesses; sometimes home-delivered  
*Food & Friends' Groceries-to-Go*



## Produce Prescriptions Programs

Vouchers for fresh produce prescribed to address diet-related illnesses  
*DC Greens' Produce Rx*



## Population-Level Healthy Food Programs

Combining food access and health care initiatives for all food-insecure individuals, regardless of health status  
*DC Central Kitchen's Healthy Corners*



## Screen and Intervene

Tailored questions about food security and/or health status used for service referral to all programs  
*DC Health requires food insecurity screenings in its local healthy food programs like Produce Plus and Joyful Markets*

# Medically Tailored Meals

- As a FIM intervention, the referral comes from the health care setting
- Meals tailored to the medical needs of the individual patient that are either picked up or delivered to the home, usually by a partnering community-based organization
- Relatively strong evidence suggests these interventions can reduce hospital admissions and readmissions, lower medical costs, and improve medication adherence
- Suitable for populations with the highest burden of disability and illness
- Relatively high cost

# Medically Tailored Groceries

- Raw ingredients that must be assembled into meals at home
- Lower cost service than medically tailored meals
- Sometimes provided by the same organizations as medically-tailored meals as a way to ease off the program; sometimes provided by food banks
- Very little impact data



# Produce Prescriptions

- When tightly linked to health care, these are FIM interventions
- Cash value (on voucher or EBT card) redeemable for fruits and vegetables
- State and local programs across the US
  - Federal program: WIC
- Lots of heterogeneity across programs
- Moderate evidence, but rapidly building
  - Improved dietary intake
  - Improved food security
  - Modelling studies show substantial downstream impacts on health outcomes and health care costs
- Suitable for populations with the lowest burden of disability and illness
  - Often targeted toward those with or at high risk of chronic disease, but can be used for prevention in less targeted populations

# On-Site Programs: A Spectrum

- Onsite food distribution
  - Food pantry permanently located at hospital or clinic, stocked and/or staffed by Food Bank
  - Mobile food distributions at hospital or clinic
  - Take-home meals provided at discharge
- On-site SNAP enrollment assistance during clinic visit or hospitalization

# 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		
PPR		✓	
	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

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

## Social Determinant of Health



- Fundamental drivers of the conditions in which people are born, grow, live, work, and age
- Focuses on underlying social and economic conditions
- Root causes

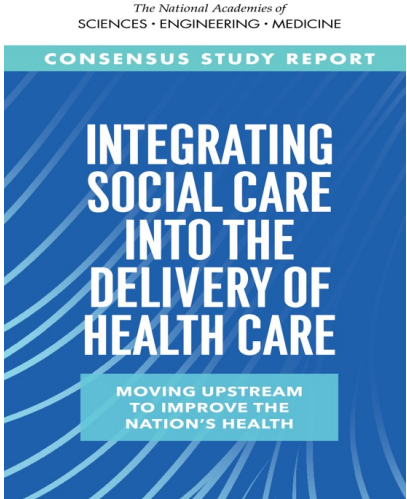
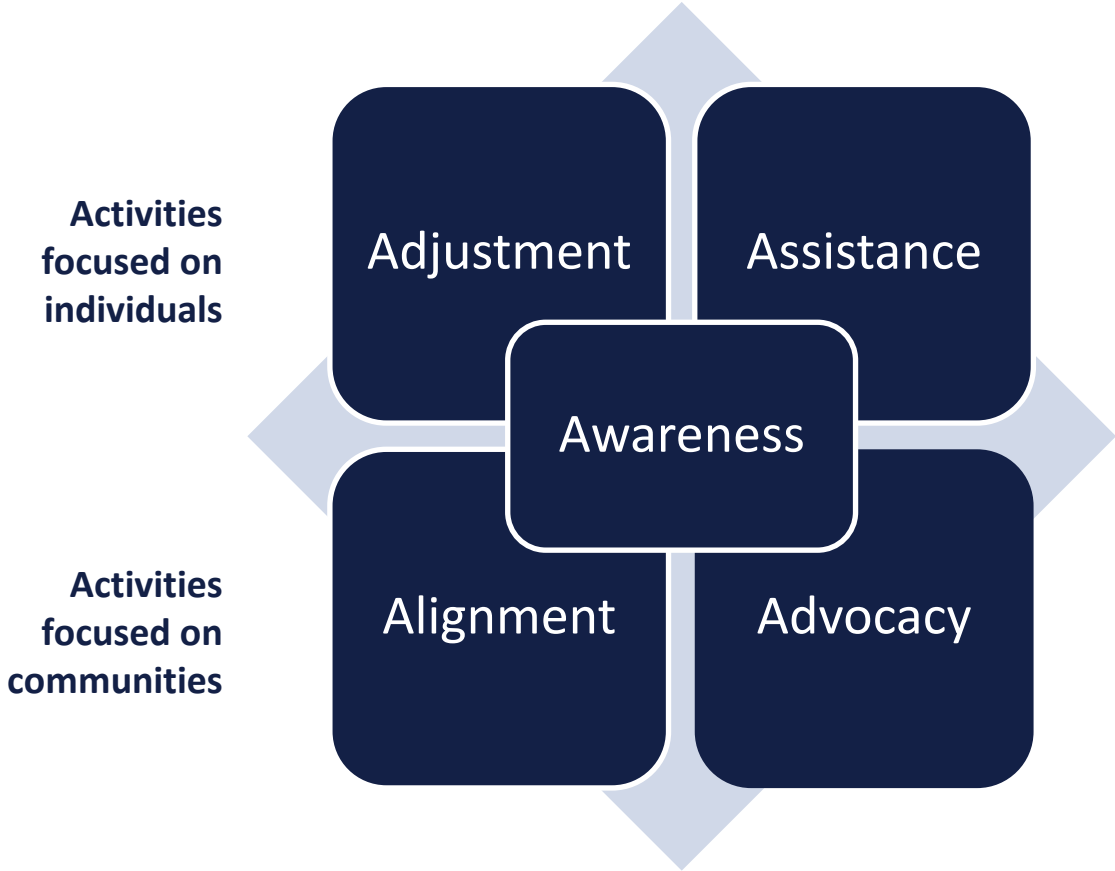
## Social Need



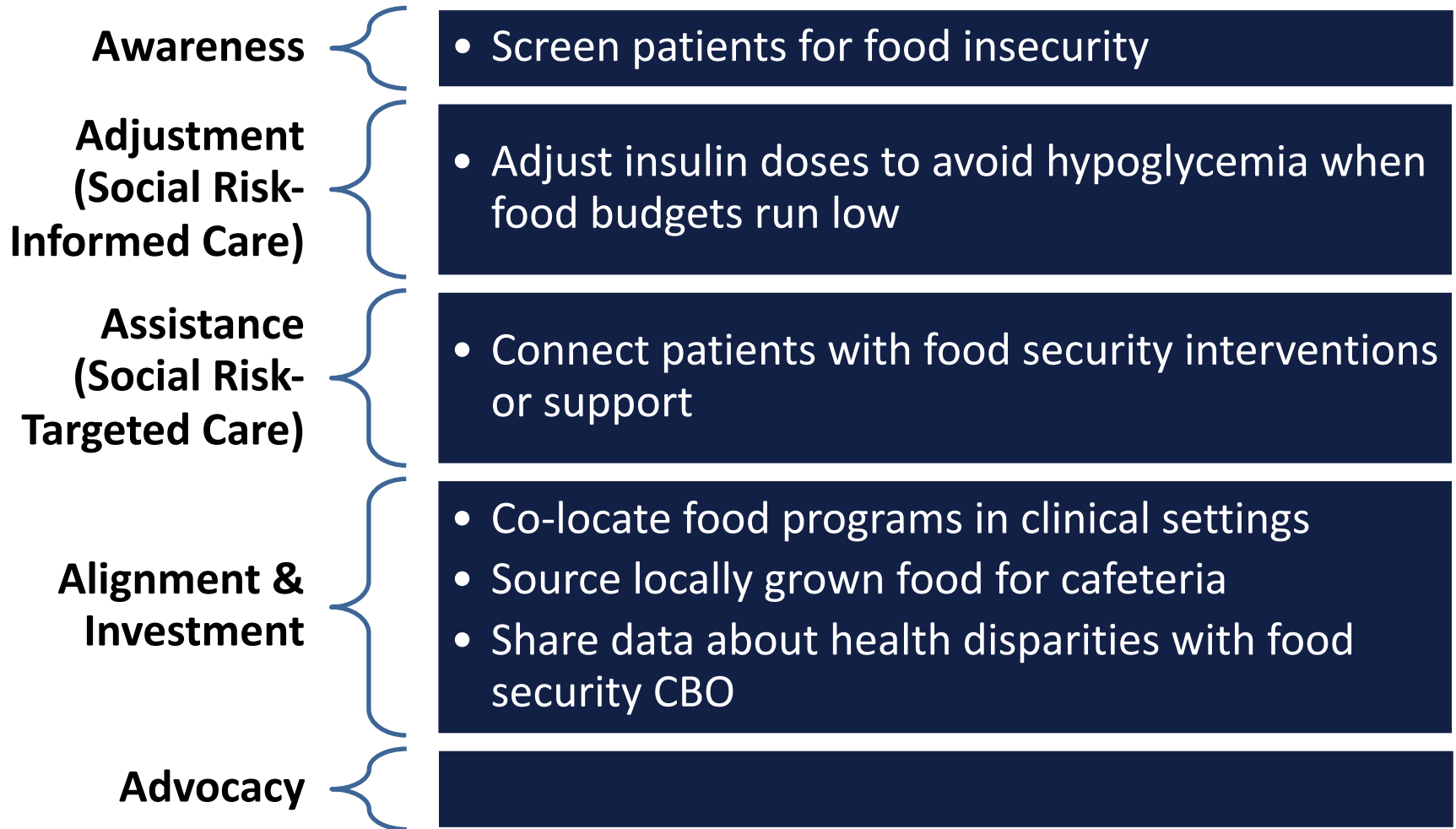
- Downstream manifestations of the impact of the social determinants of health
- Acute needs

“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)

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



# 5 A's for Food Security



CR is a 44 yo woman with DM2. She presents for routine care. She has no complaints. Her last HbA1c was 8.1%. In your 5 years taking care of her, her HbA1c has never been  $<7.9\%$ . In her glucose log, her AM blood sugars are generally in the 200's, but she has numerous values between 48 and 62 since your last clinic visit.

DM Meds: long-acting insulin qhs, glyburide, MTF

SH: 3 teenaged children, works as a house cleaner



- Numerous reasons to suspect food insecurity: diabetes with hypoglycemia, low-income, children in household
- HVS positive
- Not enrolled in SNAP (mixed documentation)
- Clinical management: support SNAP enrollment, discuss blood sugar management on days when no \$ for food, refer to food pantry for vegetables and other healthy “luxury items”





# Conclusions

- Food insecurity is an important social determinant of health
  - Increases risk of diabetes, hypoglycemia, and hyperglycemia
  - Contributes to disparities in health outcomes
- FIM interventions & SNAP can support food security, healthier dietary intake, and improved diabetes outcomes

# Good Clinical Resources

- Addressing FI: A Toolkit for Pediatricians
  - <http://frac.org/aaptoolkit> -- updated 2021
- CME: Screen & Intervene: Addressing FI Among Older Adults
  - <http://frac.org/news/free-online-course-help-health-care-providers-address-senior-hunger>
- Identifying Food Insecurity in Health Care Settings: A Review of the Evidence
  - [https://sirenetwork.ucsf.edu/sites/sirenetwork.ucsf.edu/files/SIREN\\_FoodInsecurity\\_Brief.pdf](https://sirenetwork.ucsf.edu/sites/sirenetwork.ucsf.edu/files/SIREN_FoodInsecurity_Brief.pdf)
- FI and Health: A Toolkit for Physicians and Health Care Organizations
  - <https://hungerandhealth.feedingamerica.org/wp-content/uploads/2017/11/Food-Insecurity-Toolkit.pdf>