Food Equity is Health Equity

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This is Devon

- 5 years old
- No known PMH
- Was recently admitted to the University of Chicago Burn Center with a scald injury
- Brought in by mother, Anette
- She is single mom, works 2 jobs, and has 2 older children as well

- **What do Devon and his mom have to do with this cup of instant noodles?**

Objectives:

1) Define food equity and explore how food inequity adversely impacts health.
2) Explore the positive impact that medically tailored meals (MTM) can have on clinical health outcomes.
3) Examine the role of MTM in reducing health care utilization and costs.
4) Evaluate how different states in the U.S. have approached MTM implementation.
5) Identify ways in which providers can advocate for food equity on behalf of their own patient panels.

What is Food Equity?

"The concept that all people have the ability and opportunity to grow and to consume healthful, affordable, and culturally significant food."

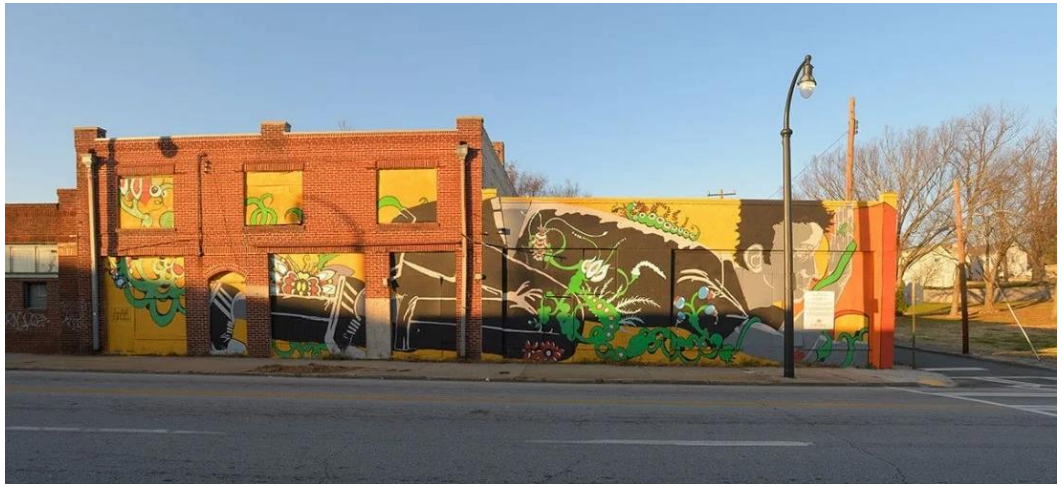
Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. (March 29, 2022) Social Determinants of Health. Retrieved February 27, 2023 from https://www.cdc.gov/chronicdisease/healthequity/social-determinants-of-health-and-chronic-disease.htm

Food and Nutrition Security

Exists when people have physical, social, and economic access to food that is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, allowing for a healthy and active life.

- **Food *in*security** is associated with[1]:
  - Cognitive abnormalities, birth defects
  - Chronic inflammation, stress
  - Chronic diseases in adults (hypertension, diabetes, hyperlipidemia, obesity, sleep disorders)
  - Behavioral health disorders (anxiety, depression)
  - All-cause death[2]

(1) Beltran, et al. *PLoS One*. 2020.; (2) Sun, et al. *j Am Heart Assoc*. 2020.



Food Deserts

Areas where residents have few (or no) convenient options for securing affordable and healthful foods – **especially fresh fruits and vegetables**

- Disproportionately affects high-poverty areas
  - Residents with lower socioeconomic status
  - A disproportionate reality for Black communities in urban areas

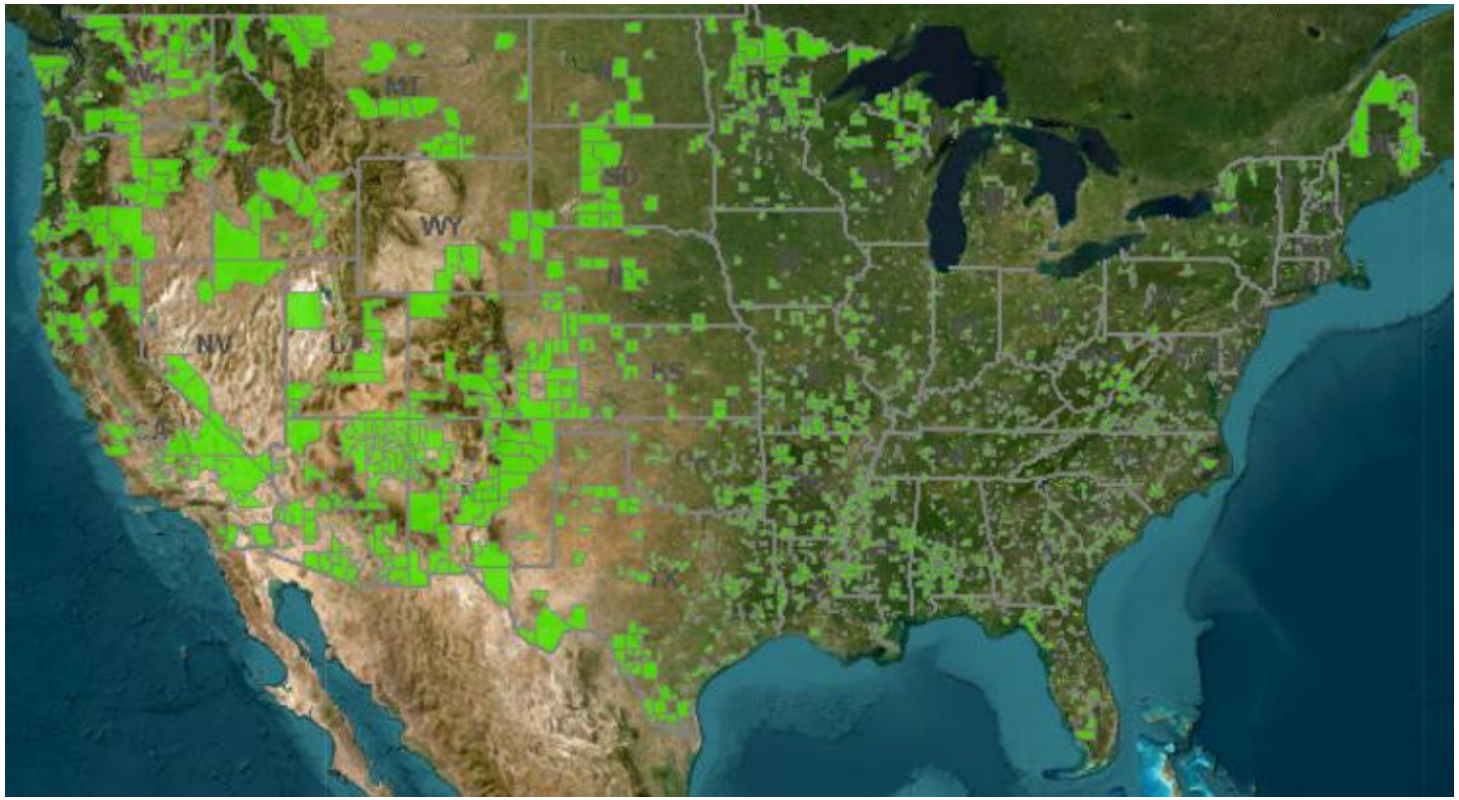
Annie E. Casey Foundation (Feb 13, 2021) Food Deserts in the United States. Retrieved February 27, 2023 from https://www.aecf.org/blog/exploring-americas-food-deserts

Where do Food Deserts Exist?

According to the U.S. Department of Agriculture:

- Low-income census tract where ≥33% of residents must travel an inconvenient distance to reach the nearest grocery store

~40 million people
(13% of Americans)
live in food deserts



U.S. Department of Agriculture (Dec 9, 2022). Retrieved February 27, 2023 from https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas/

Food Insecurity, Food Access, and Diabetes

- Food insecurity is associated with higher HbA1c[1,2]
  - True in women, rural regionals (e.g., U.S. Appalachia), and children with diabetes
- Food insecure adults are more likely to report hospitalizations and emergency room visits related to their diabetes
- Children with type 1 or 2 diabetes living in food insecure homes were hospitalized 4x as often as children in food secure homes
- Food insecure adults with diabetes have higher rates of depression
- They also have increased anxiety, worry, shame, guilt surrounding their food insecurity and an inability to pay for necessary medications

(1) Berkowitz, et al. *Diabetes* Care. 2018.; (2) Gucciardi, et al. *Curr Nutr Rep*. 2014.

Food Insecurity, Food Access, and Hypertension

- Chronic stress of food insecurity is thought to play a role in cardiovascular and hypertension
- **Systematic review and meta-analysis evaluating food insecurity and hypertension:**
- 28 studies of adults (~200,000 adults)
  - No association with hypertension (in studies where SBP/DBP was measured)
  - 46% more likely to have prior diagnosis of hypertension
- 5 pediatric studies (~20,000 children)
  - 44% more likely to have hypertension

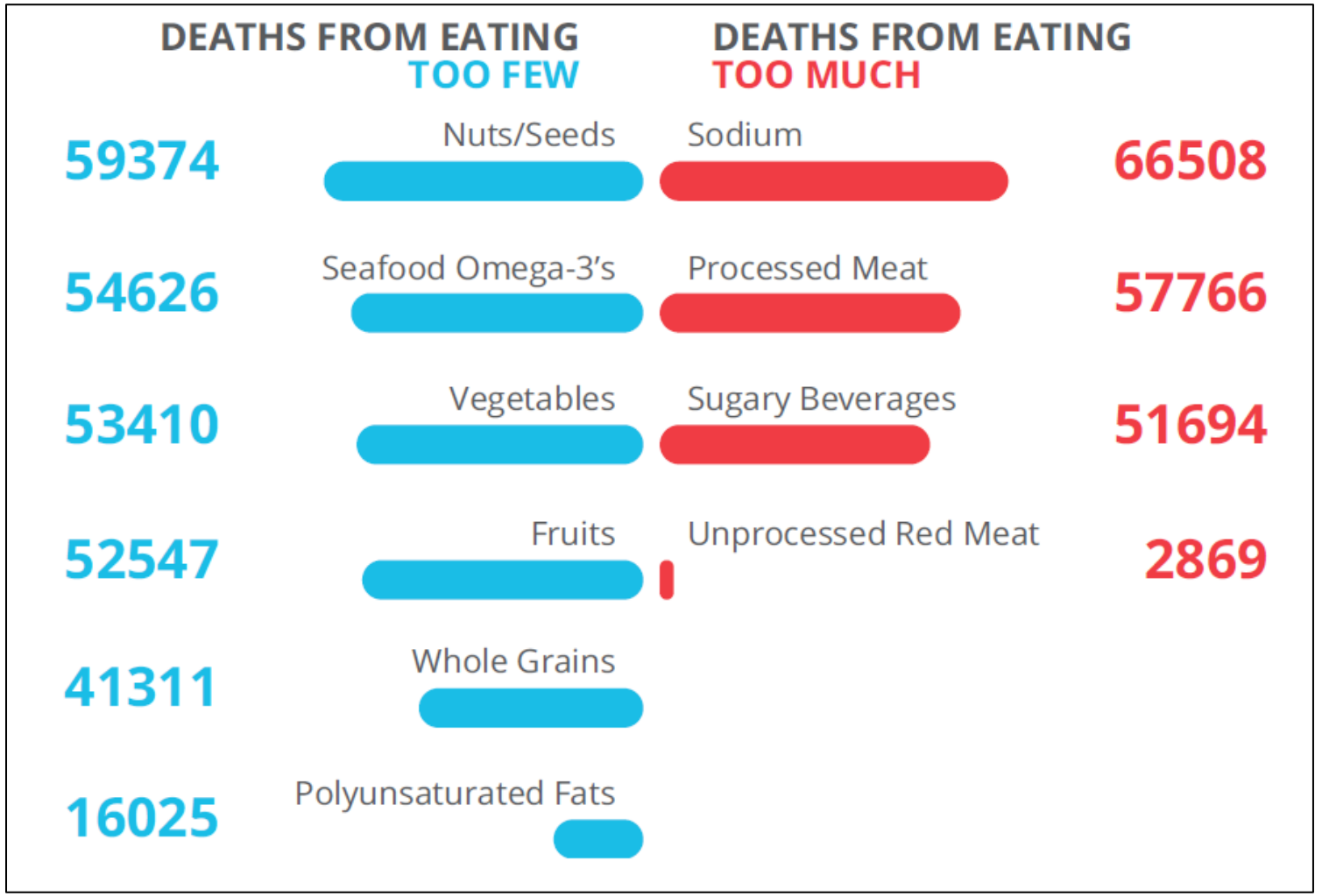
Beltran, et al. *PLoS One*. 2020.

Dietary Habits and Cardiometabolic Deaths

- **702,308 deaths** occurred due to heart disease, stroke, and type 2 diabetes that occurred in 2012

- Q: How many deaths occurred due to eating **too few or too many** of the following 10 dietary factors:

  - Nuts/seeds
  - Seafood omega-3s
  - Vegetables
  - Fruits
  - Whole grains
  - Polyunsaturated fats
  - Sodium
  - Processed meats
  - Sugary beverages
  - Unprocessed red meats



Micha R, et al. *JAMA*. 2017. ; Weber JA, Defining Food Equity, ahealthieramerica.org.

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3) **Examine the role of MTM in reducing health care utilization and costs.**
4) Evaluate how different states in the U.S. have approached MTM implementation.
5) Identify ways in which providers can advocate for food equity on behalf of their own patient panels.

“Food as Medicine”

<u>Three Types</u>:

- **Medically Tailored Meal (MTM)**
  - Meals developed by a Registered Dietician (RD) to address the dietary needs of an individual’s medical condition(s)

- **Medically Tailored Groceries (MTG)**
  - Food packages of minimally prepared grocery items selected by an RD
  - May contain suggested recipes

- **Nutritious Food Referrals**
  - Funds for free (or discounted) nutritious foods
  - Can be used at farmers’ markets or Community Supported Agriculture programs

“Food as Medicine”

Hypothesis: “Food as Medicine” interventions are effective, low-cost strategies that would achieve the following 3 goals:

1) **Improve health outcomes**

2) **Enhance patient quality of life**

3) **Decrease utilization of expensive health services**

Impact on Health Outcomes

Hypoglycemia[1]:

- 44 adults with diabetes *and* with low SES, HbA1c >8%, and identified food insecurity
- Randomized Crossover: 12 weeks of MTM (10 meals/week) | 12 weeks of usual meals
- Hypoglycemia in past 3 months: 47% with MTM vs. 64% with usual meals (p=0.03)
- Reduced food

Hemoglobin A1c[2]:

- 43 adults with diabetes (HbA1c >9%) and identified food insecurity
- Randomized Controlled Study: 6 months of MTG delivered every 2 weeks vs. control
  - 10lbs of food bank produce and 10lbs of canned food (beans, vegetables, fish, chicken)
  - Teaching from a food bank dietician
- Absolute change in A1c was 3.1% among MTG group vs. 1.7% among controls (p=0.12)

(1) Berkowitz, et al. *J Gen Intern Med*. 2019.; (2) Ferrer, et al. *Nutr Metab Insights*. 2019.

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Impact on Health Outcomes

Blood pressure:

- 80 adults with hypertension, diabetes, prediabetes and/or hyperlipidemia
- 74% earned <$15,000 annually, 87% were food insecure, 67% forced to choose between food and medicine in past year

~$24/box

- **<u>Intervention (12 months)</u>:**
  - Monthly food package: Fresh fruits and vegetables, shelf-stable foods (beans, nuts/seeds, no-sugar added dried fruit, low-sodium vegetable juice, whole grains, olive oil, canned fatty fish, anti-inflammatory spice containers)
  - Food curriculum & recipes tailored to food box items

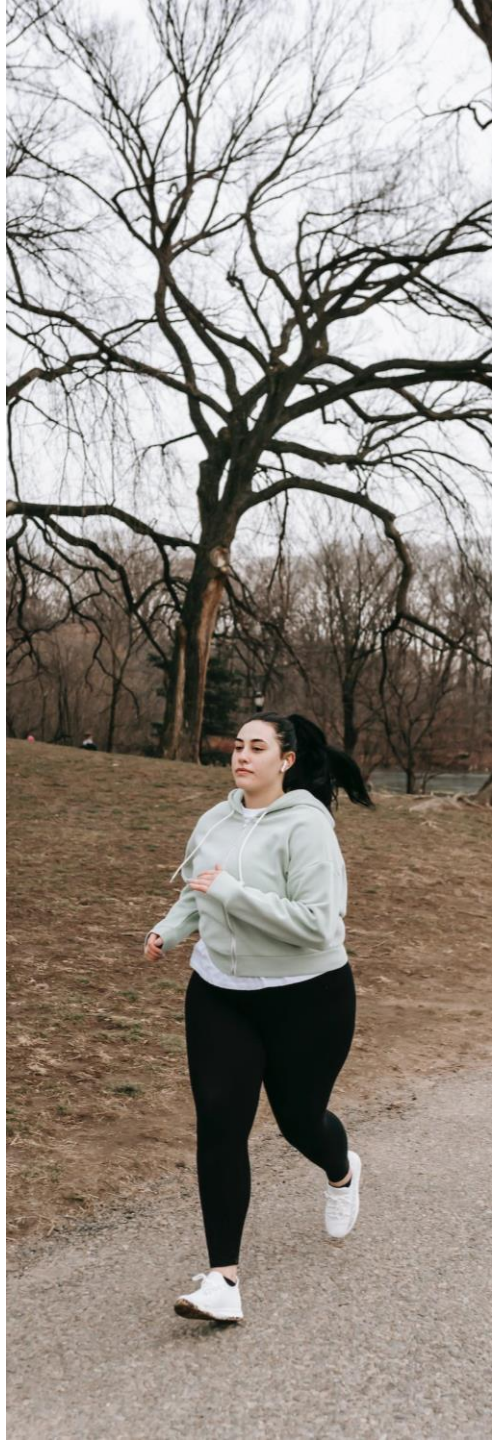
- **<u>Results</u>:**
  - Among hypertensive participants who accessed food assistance ≥4x (n=17), diastolic BP improved from 91mmHg to 84 mmHg (p=0.009)

(1) Wetherill, et al. *J Nutr Educ Behav*. 2018.

Impact on Health Outcomes

Depression Scores and Physical Activity:

- **Goal:** leverage food bank capacities and expertise to screen clients for disease risk and provide targeted nutrition services
- 244 food bank clients at risk for type 2 diabetes
- **Intervention (6 months):**
  - Monthly distribution of **diabetes-appropriate food packages** (lean proteins, legumes, fruits, vegetables, whole grains; low sodium and low in added sugars)
  - **Text-based health promotion education** (focus on physical activity and nutrition
- **Results (compared to baseline):**
  - **Reported physical activity:** increased from 96 mins/week to 145 mins/week ($p<0.001$)
  - **Depression scores:** PHQ-2 scores > 3 declined from 25% to 15% ($p<0.001$)



(1) Cheyne, et al. *Prev Chronic Dis*. 2020.

Impact on Quality of Life

Healthy Eating Index (HEI)[1]:

- Higher HEI score (0-100) represents better dietary quality
- Reflects increased consumption of vegetables, fruits, whole grains, healthy fats, added sugars, alcohol
- Following 12 weeks of MTM (10 meals/week) vs. 12 weeks of usual meals, **HEI scores were 71 vs. 40** ($p<0.0001$)

Food Security Status[2]:

- Following 6 months of diabetes-appropriate food packages, **adults skipped fewer meals** (44% vs. 29%) and **food insecurity dropped** (69% vs. 63%), both $p<0.001$

Health Care Behaviors[3]:

- Following 6 months of meals/snacks that ensured 100% of daily energy requirements for 52 adults with diabetes and/or HIV
- Fewer depressive symptoms, binge drinking in past month (27 vs. 14%), sacrificing food/prescriptions for healthcare (and vice versa); all $p<0.05$
- Improved **adherence to antiretroviral therapy** (47% to 70%), perceived DM self-management, less diabetes distress; all $p<0.05$
- Very low food security decreased (60% to 12%)

(1) Berkowitz, et al. *J Gen Intern Med*. 2019.; (2) Cheyne, et al. *Prev Chronic Dis*. 2020.; (3) Palar, et al. *J Urban Health*. 2017.

Impact on Quality of Life

Satisfaction[1]:

- Among 687 adults with diabetes and low SES who received 6 months of diabetes food boxes ($16/box):
  - 88% reported a preference for a diabetes food box (vs. regular food box)
  - 87% ate all (or most) of its contents

Food Category Purchases[2]:

- 33 adults with food insecurity and cancer (on chemotherapy) received a monthly $230 voucher to purchase food
  - 28% of voucher funds were spent on fruits and vegetables
  - 77% of items from voucher receipts were categorized as “healthy”
  - 70% of participants reported eating most (or all) of the food themselves

Feasibility of a Hospital-Based Preventive Food Pantry[3]:

- 30 Patients with Food Insecurity: trust, lack of stigma, healthier foods than other pantries
- 89 Providers: improved health of their patients, identified time constraint as a barrier

(1) Seligman, et al. *Health Aff (Millwood)*. 2015.; (2) Paolantonia, et al. *Support Care Cancer*. 2020.; (3) Greenthal, et al. *Public Health Nutr*. 2019.

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1) **Improve health outcomes** ✓

2) **Enhance patient quality of life** ✓

3) **Decrease utilization of expensive health services**

Examining Health Care Costs Among MANNA Clients and a Comparison Group

Study Population:

- Adults with HIV, kidney disease, or cancer
- Part of a nearby Medicaid managed care organization
- Open to receiving MTM from a non-profit, Philadelphia-based organization, Metropolitan Area Neighborhood Nutrition Alliance (MANNA)

Pilot Study:

- Intervention: 21 meals/week for 3 months) + RD nutritional counseling (n=65)
- Control: matched for gender, age, race, and ethnicity (n=633)

Primary Outcome:

- Overall cost of healthcare (total expenditure, emergency room visits, hospitalizations)

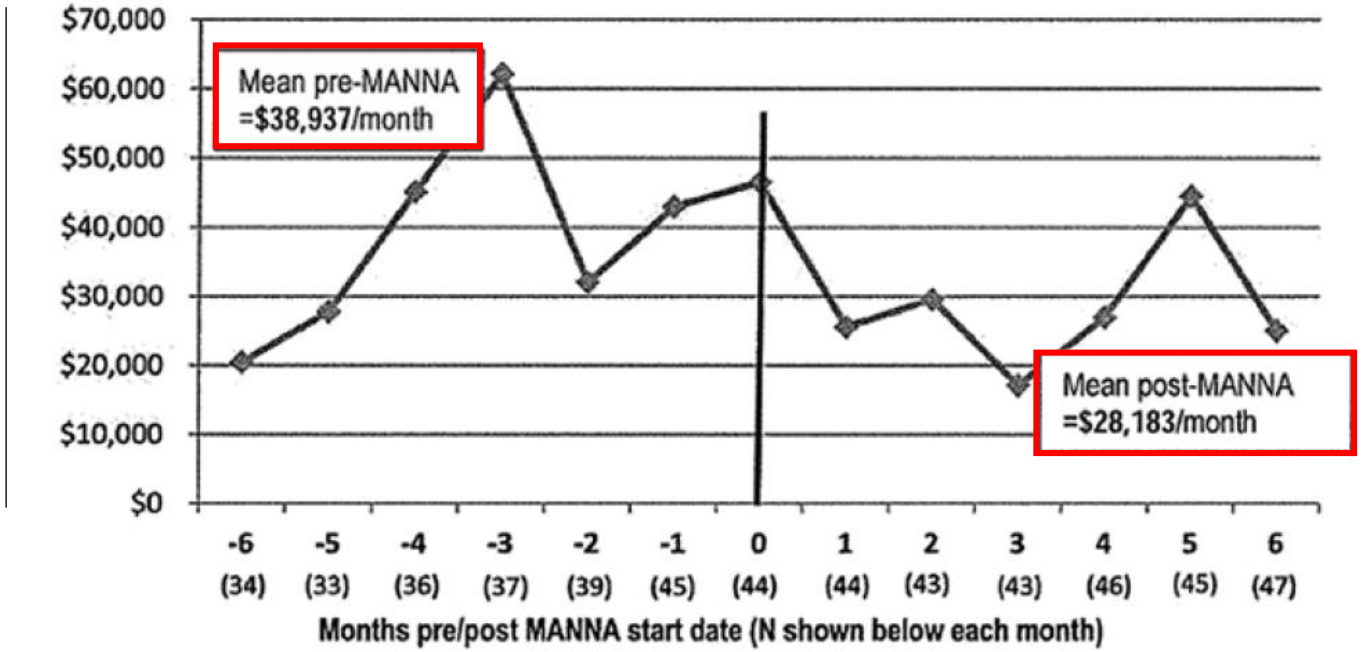
Gurvey, et al. *J Prim Care Community Health*. 2013.

Examining Health Care Costs Among MANNA Clients and a Comparison Group

Intervention Group Results:

- 43% HIV/AID, 38% COPD, 26% cancer, 25% diabetes, CHF, liver disease
- Mean annual income was $10,188

Mean monthly healthcare cost for MANNA recipients



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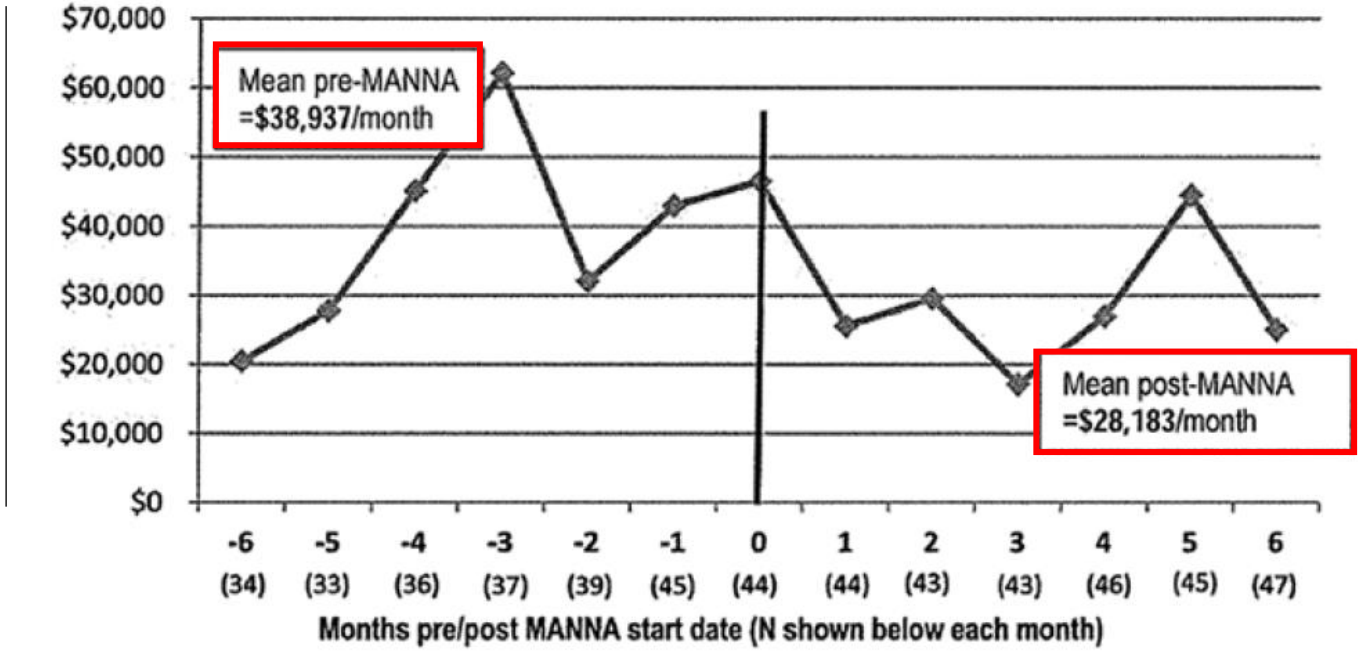

12 months post-intervention:

MANNA	Control
$28,268	$40,906

P=0.006

Gurvey, et al. *J Prim Care Community Health*. 2013.

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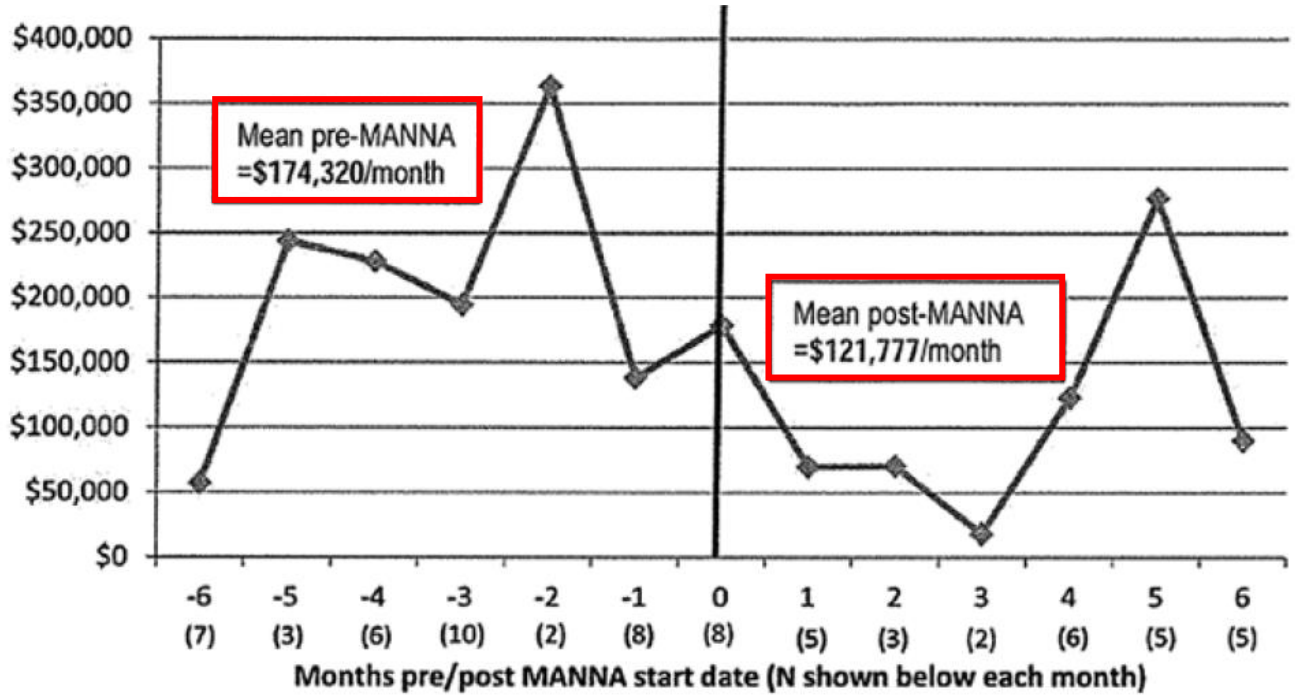
Mean monthly inpatient hospital cost for MANNA recipients



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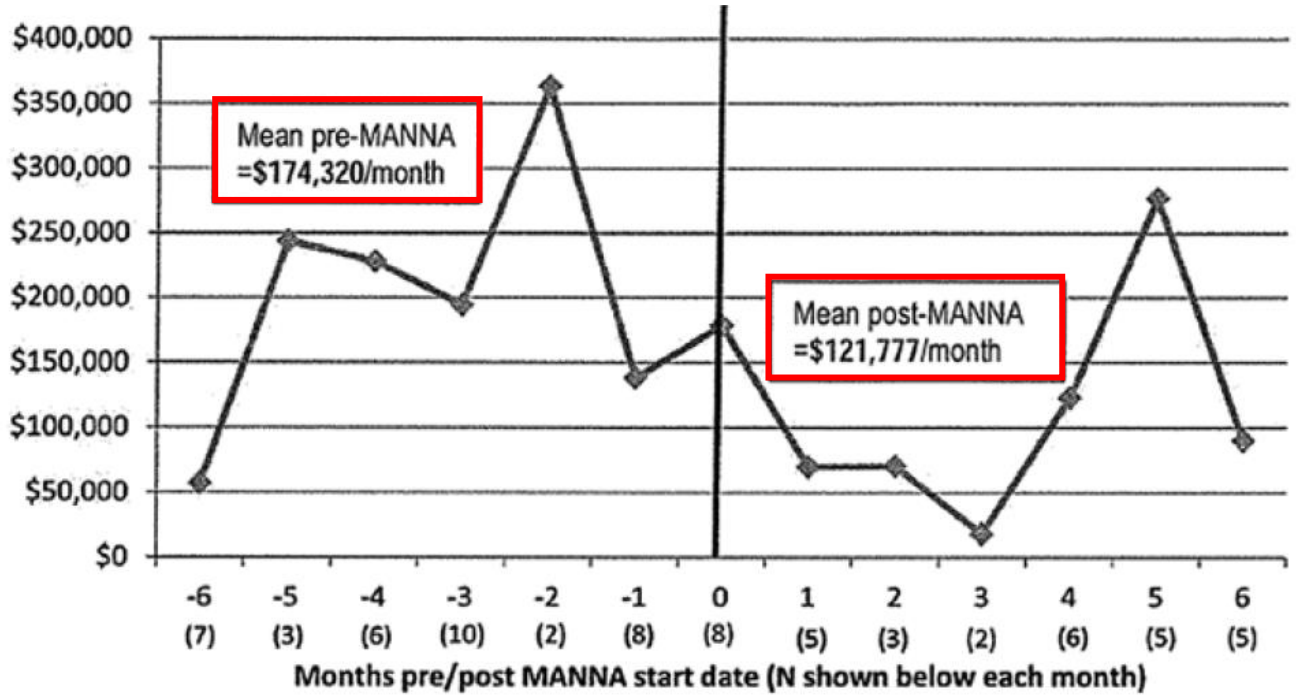


12 months post-intervention:

MANNA	Control
$132,441	$219,639

P=0.001

Gurvey, et al. *J Prim Care Community Health*. 2013.

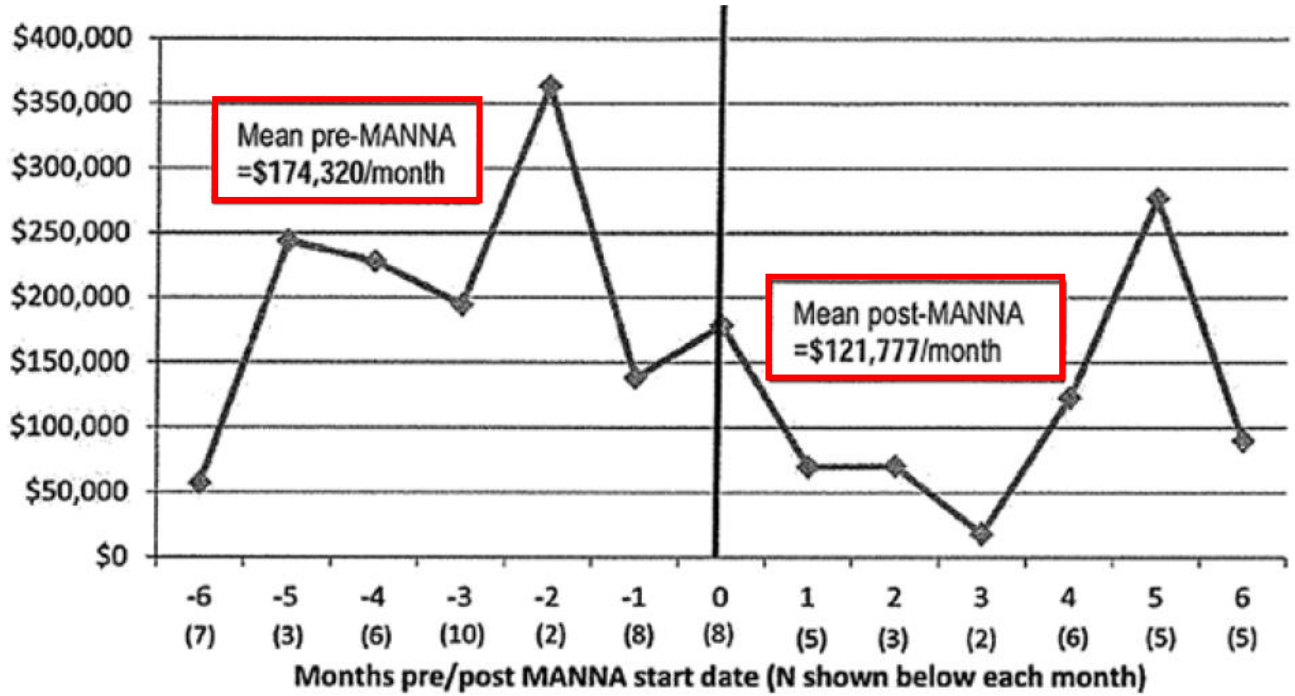
Examining Health Care Costs Among MANNA Clients and a Comparison Group

Intervention Group Results:

- 43% HIV/AID, 38% COPD, 26% cancer, 25% diabetes, CHF, liver disease
- Mean annual income was $10,188

- LOS in hospital was 37% shorter
- 50% fewer admissions
- 23% more likely to be discharged home

Mean monthly inpatient hospital cost for MANNA recipients



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P=0.001

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Meal Delivery Programs Reduce The Use Of Costly Health Care In Dually Eligible Medicare And Medicaid Beneficiaries

Study Population:

- Adults dually eligible for Medicare and Medicaid not receiving any meal programs

Study Design: Randomized Controlled Trial

- **Meal Program 1:** MTM (10 meals/week + snacks) + RD nutritional counseling (n=133)
- **Meal Program 2:** non-tailored Meals on Wheels-type food program (n=624)
- **Control:** matched for SES, clinical characteristics (n=1,318)

Primary Outcome: Emergency room visits

Secondary Outcomes: Inpatient admissions, emergency transportation use, medical spending

Berkowitz, et al. *Health Affairs*. 2018.

Meal Delivery Programs Reduce The Use Of Costly Health Care In Dually Eligible Medicare And Medicaid Beneficiaries

	Compared to Matched Controls	P-Value
EMERGENCY ROOM VISITS		
MTM Program	**70% less likely**	<0.001
Nontailored Food Program	**44% less likely**	<0.001
INPATIENT ADMISSIONS		
MTM Program	**52% less likely**	<0.05
Nontailored Food Program	12% less likely	NS
EMERGENCY TRANSPORTATION EVENTS		
MTM Program	72% less likely	NS
Nontailored Food Program	**38% less likely**	<0.001

Berkowitz, et al. *Health Affairs*. 2018.

Meal Delivery Programs Reduce The Use Of Costly Health Care In Dually Eligible Medicare And Medicaid Beneficiaries

Average Monthly Medical Spending per Person

	Intervention Group	Matched Control Group	Gross Difference	Net Difference
MTM Program❖	$843	$1,413	–$570**	–$220
Nontailored Food Program✧	$1,007	$1,163	–$156*	–$10

❖Monthly cost of program $350
✧Monthly cost of program $146

** P<0.01
* P<0.05

Berkowitz, et al. *Health Affairs*. 2018.

JAMA Internal Medicine | Original Investigation

Association Between Receipt of a Medically Tailored Meal Program and Health Care Use

Objective:

- Evaluate whether MTM intervention is associated with fewer hospitalizations

Study Design:

- Retrospective cohort study of Massachusetts all-payer claims database and Community Servings
- Compared outcomes among recipients of MTM (10 meals/week) vs. matched non-recipients

Primary Outcome: Inpatient admissions

Secondary Outcomes: Skilled nursing facility (SNF) admissions, health care costs

Berkowitz, et al. *Health Affairs*. 2018.

JAMA Internal Medicine | Original Investigation

Association Between Receipt of a Medically Tailored Meal Program and Health Care Use

Results:

- 499 MTM recipients and 521 matched non-recipients
- MTM group received meals for an average of 12 months

Berkowitz, et al. *Health Affairs*. 2018.

JAMA Internal Medicine | Original Investigation

Association Between Receipt of a Medically Tailored Meal Program and Health Care Use

	Compared to Matched Non-Recipients	Incidence Rate Ratio (95% Conf Interval)
HEALTH CARE USE		
Inpatient Admissions	**49% less likely**	0.51 (0.22-0.80)
Skilled Nursing Facility Admissions	**72% less likely**	0.28 (0.01-0.60)
HEALTH CARE COSTS		
Mean Monthly Costs	**$3838 vs. $4591**	**–$753** (–$1225 - –$280)
Costs Related to Inpatient and SNF Visits	NS	NS

Berkowitz, et al. *Health Affairs*. 2018.

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What Did These Studies Have in Common?

- Focused on low SES populations or individuals with identified food insecurity
- Intervention often lasted months

- Few addressed or assessed sustainability

"If you give a man a fish, you feed him for a day. If you teach a man to fish, you feed him for a lifetime."

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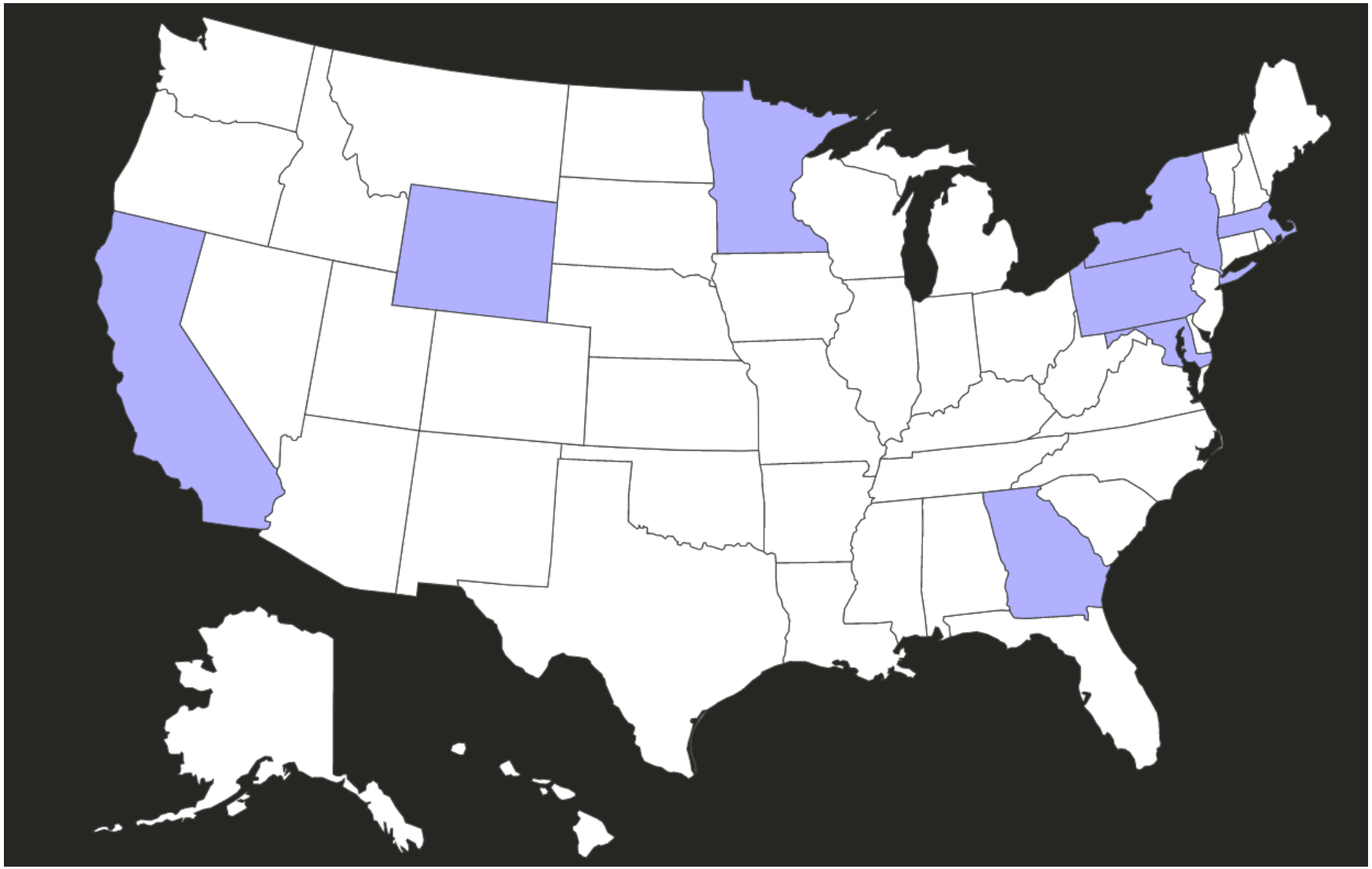
MTM State-Based Innovation for Medicaid Patients



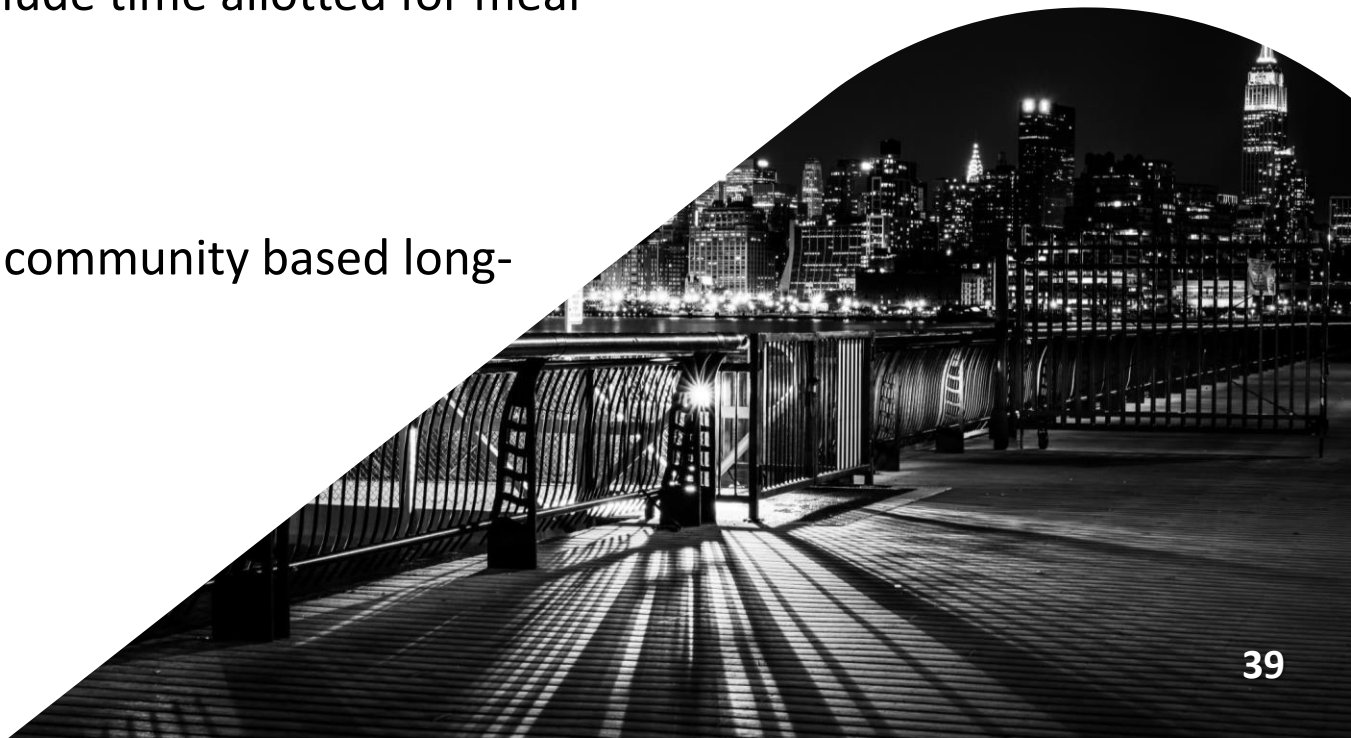
New York

<u>Medicaid Managed Care Plans</u>:

- ≥ 18 years or older who receive Personal Care Aide (PCA) services
- MTMs may substitute PCA services that include time allotted for meal preparation

<u>Managed Long-Term Care recipients</u>:

- Dual eligible patients, ≥ 21 years, requiring community based long-term care services for >120 days
- Encouraging readmission rates



https://www.fimcoalition.org/healthcare-innovation

California

<u>Medi-Cal MTM Pilot Program</u>:

- Launched on April 1, 2018 in eight counties
- $6 million budget for a 4-year pilot
- MTM: 3 meals/day x 12 weeks to 1,413 beneficiaries with heart failure
- Outcomes: hospitalizations, ER visits, SNF admissions

https://www.dhcs.ca.gov/services/ltc/Pages/Medically-Tailored-Meals-Pilot-Program.aspx.

Georgia

<u>Community Care Services Program</u>:

- Frail elderly and disabled Georgians who would otherwise be eligible for a nursing home stay healthy at home with a MTM provision
- Allows client to choose to receive services in the home rather than in a nursing home
- Clients remain eligible pending financial eligibility and continued need for nursing home level of care

https://medicaid.georgia.gov/programs/all-programs/waiver-programs#:~:text=Found%20in%20the%20Elderly%20%26%20Disabled,%2C%20personal%20care%2C%20home%2Ddelivered

Colorado

“Transition Services”:

- Transition Services were created as a result of the successful Colorado Choice Transitions (CCT) Program
- Transition Services includes the most successful aspects of the CCT program including:
  - A case management benefit available to those transitioning from a long-term care facility back to independent living
  - Four service waivers:
    - **MTM**
    - Life skills training
    - Peer mentorship
    - Transition setup

https://hcpf.colorado.gov/transition-services

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Clinical Considerations

- **Consider standardized screening for food insecurity during check-in**
  - "In the past month, was there any day when you or anyone in your family went hungry because you did not have enough money for food?"
- **Tailor recommendations for individuals with food insecurity[1]**
  - Use longer acting anti-glycemics (e.g., metformin, SGLT2 inhibitors, long- acting insulin) to mitigate risk of hypoglycemia if a person misses a meal
  - Keep in mind affordability – less expensive supplies (and medications) minimize effects of food insecurity
- **Identify local food banks that can offer MTM or MTG[2]**
  - Poverello
  - Feeding Tampa Bay
  - Second Harvest Food Bank of Central Florida
  - Treasure Coast Food Bank (Fort Pierce)

(1) Gucciardi, et al. *Current Nutrition Reports*. 2014.; (2) https://www.fimcoalition.org/partners.

Policy and Healthcare Considerations

- **Insurers are increasingly supporting MTM and MTG initiatives**
  - Highmark Health in Pittsburgh, PA will supply MTM for up to 1 year (2 meals/day) for ~1,000 members[1]
  - Blue Cross Blue Shield (BCBS) and Health Care Service Corporation (HCSC) partnered to create "foodQ," a food delivery option to those living in food deserts[2]
    - Program is available to all consumers, regardless of insurance status (~$5/meal, delivered to home)
    - 25 Chicago ZIP codes, 15 Dallas ZIP codes
  - Blue Cross Blue Shield of Massachusetts and Community Servings partnered to provide 8 weeks of MTM to Medicare Advantage members post-discharge[3]
- **Population Health or Value-Based Care Companies in CKD population**[4]
- **Advocacy and Public Policy**[5]

(1) https://www.highmarkhealth.org/hmk/newsroom/pr/2022/2022-12-05-Medically-Tailored-Meals.shtml#:~:text=The%20Medically%20Tailored%20Meals%20program,for%20up%20to%20one%20year;
(2) https://www.fiercehealthcare.com/payer/bcbs-hcsc-debut-food-delivery-service-as-preventative-measure;
(3) https://coverage.bluecrossma.com/article/meals-are-medicine
(4) Lin, et al. *JASN*, 2023.
(5) Roth, et al. *CJASN*, 2023.

Before We Conclude:
What Happened to Devon?

Pediatric instant noodle burns: A ten-year single center retrospective study

Methods:

- Retrospective review of all pediatric patients (<18 years) admitted the University of Chicago Burn Center with a diagnosis of “scald injury” between 2010 and 2020

Results:

- Among 790 total scald burns, 245 **(31%) were attributed to instant noodles**
- Compared to other scalds, patients with instant noodle burns were:
  - Older (5.5 vs. 4 years)
  - More likely to be Black/African American (91% vs. 75%)
  - Live in areas with lower childhood opportunity index score (10 vs. 15)
  - More likely to be unsupervised at the time of injury (37% vs. 21%)

Shen, et al. *Burns*. 2023.

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“Let food be they medicine”

Thank You

Any Questions?