Food Insecurity & Chronic Disease: Addressing a Complex Social Problem Through Programs, Policies, and Partnerships

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November 28, 2017
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.
Diet is a Cornerstone of Care for the Most Common Chronic Diseases

- Diabetes
- High blood pressure
- High cholesterol
- Obesity
- Congestive Heart Failure
How can we make a meaningful DIFFERENCE when we see patients so infrequently & for so little time?
• **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
U.S. Households by Food Security Status, 2016

- **Food Secure Households**: 87.7%
  - 17.5 million adults
  - 6.5 million kids

- **Households with Low Food Security**: 7.4%
  - 10.8 million adults
  - 703 thousand kids

- **Households with Very Low Food Security**: 4.9%
  - 10.8 million adults
  - 703 thousand kids

**US Food Insecurity Rate**: 12.7%

~1 in 8 households

Source: Calculated by ERS, USDA, using data from the December 2016 Current Population Survey Food Security Supplement
Figure 3
Trends in the prevalence of food insecurity and very low food security in U.S. households, 2001-2016

Percent of households

Risk Factors (Household-Level)

- Children (17%)
  - Children under age 6 (17%)
  - Children with single mother (32%)
  - Children with single father (22%)
- Income <185% FPL* (32%)
- Black (23%) or Latino (19%)
- Smoker in the household

Nearly 50% of US children and 90% of Black children used Food Stamps at some point during their childhood.

About 50% of US adults receive Food Stamps at some point between the ages of 20 and 65.

* FPL=federal poverty level ($24,300 for household of 4 in 2016)

USDA, Coleman-Jensen, 2017; Rank, 2009.
Four Questions

• Does food insecurity impact health?
• How can Strategic Science help us to make our work more impactful?
• What are the economic implications of food insecurity?
• How should we respond?
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
- Eating highly filling foods
- Small variety of foods
- Avoiding food waste
- Binging when food is available

- Higher risk of obesity, diabetes, & other diet-sensitive chronic disease
- Once you are chronically ill, poorer ability to manage your illness
Does Food Insecurity Impact Health?

Adapted from Seligman and Schillinger, New England Journal of Medicine, 2010.
Across the Lifespan:

• Kids: anemia, behavioral problems, poorer mental health, poor cognitive development & academic achievement, hospitalizations, ?obesity

• Adults: obesity (women), diabetes, high blood pressure, heart disease, depression, poorer HIV outcomes, more hospitalizations, poorer mental health

• Elderly: reduced independence

These are just a few of the MANY associations.
Coping Strategies

• Dietary Quality
  – Food affordability
• Bandwidth & Stress
• Eating Behaviors
  – Episodic food inadequacy
Relation between the energy density of selected foods and energy costs (¢/MJ)
Figure 2.7  Price Indexes for Selected Foods and Beverages, 1980-2010

Price Index (1982-1984=100)

- CPI (consumer price index)
- Carbonated drinks
- Non-alcoholic beverages
- Whole milk
- Fresh fruits and vegetables
- All fruits and vegetables

Notes: Prices for each group are annual average prices for all urban consumers. All fruits and vegetables include fresh, canned, and frozen. Base period 1982-84=100. Source: National Health and Nutrition Examination Survey data, 2003-2006.
Figure 1.2  Low-Income Households Spend the Greatest Portion of Income on Food

Percent of income spent on food

Note: Average annual incomes for the quintiles in 2009 were $9,846 for the lowest, $46,012 for the middle, and $157,631 for the highest.

Food Costs, Dietary Intake, & Obesity

• Diet recommended by USDA requires low-income family spend 43-70% of their food budget on F&V’s

• Increasing dietary potassium to meet 2010 USDA Dietary Guidelines for Americans would add $380 to the average consumer’s annual food costs
  – Meanwhile, each 1% additional calories from saturated fat and sugar results in significant decrease in food costs.

Food Affordability & Cost

- What is *affordability*?
- Time for Preparation
- Equipment for Storage & Preparation
- Time & $ for Travel to Full-Service Store
- Variety
- Poor Quality
- Fear of Food Waste
Coping Strategies

• Dietary Quality
  – Food affordability

• **Bandwidth & Stress**

• Eating Behaviors
  – Episodic food inadequacy
Hunger Takes Up a Lot of Brain Space

• Less space left over for:
  – Registering/re-registering for benefits
  – Applying for/maintaining employment
  – Taking care of health needs
  – Parenting children
Coping Strategies

• Dietary Quality
  – Food affordability

• Bandwidth & Stress

• Eating Behaviors
  – Episodic food inadequacy
Food Insecurity is Cyclic & Episodic

• Variation is monthly, seasonal, & random
• Average 7 episodes per year
• Dietary intake fluctuates, particularly among mothers
Diabetes: Blood Sugar Balance

Drive Blood Sugar Up

Food
- Carbohydrates

Drive Blood Sugar Down

Diabetes medicine
Physical Activity

HYPERGLYCEMIA:
- Blindness
- Amputations
- Kidney Failure

HYPOGLYCEMIA:
- Poor quality of life
- Cognitive dysfunction
- Seizures
- Coma
- Death
Compensatory Strategies

Food Shortage
- Skipped meals
- Reduced caloric intake

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

Diabetes as a Model

Food Shortage
- Skipped meals
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Food Adequacy
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LOW BLOOD SUGAR

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

Seligman HK et al. Health Aff 2014;33:116-123

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Cost of A Health Care Visit for Low Blood Sugar vs. Food

- **Inpatient Admission**: $17,564
- **Emergency Visit**: $1,387
- **Outpatient Visit**: $394
- **Monthly Food Cost (Family of 4)**: $657

American Journal of Managed Care, 2011.

*Thrifty Food Plan*
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Hopeful (Wishful) Thinking

Research

Pretty Good

Scientists

Poor

Social Change

Poor

Policy Change

Slide from Kelly Brownell PhD
Making Our Work Matter

Research → ??? → Social Change

Policy Change
Research

- Legislators
- Regulators
- Courts
- Press
- Public
- NGOs
- Industry

Social Change

Policy Change

Slide from Kelly Brownell PhD
Strategic science with policy impact

Kelly Brownell & Christina Roberto, 2015

1. Identify change agents
2. Develop strategic questions
3. Scholarship
4. Communications
Four Questions

• Does food insecurity impact health?
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• How should we respond?
As a policymaker you may want to know: If we put money , can we save money ?

- **Inpatient Admission**: $17,564
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- **Monthly Food Cost (Family of 4)**: $657* (Thrifty Food Plan)

American Journal of Managed Care, 2011.
Resources for Food Insecure Households

- Federal Nutrition Programs
- Charitable Feeding System
- Informal Social Support
- Personal Income/Budget Shifts
Resources for Food Insecure Households

• Approximately 1 in 7 Americans (46 million people, $70 billion)
• Redeemable in every US county
• Average benefit $1.40/person/meal
• Very effective at reducing food insecurity, but 54% of households still food insecure
Admissions for Low Blood Sugar Increase by 27% in Last Week of the Month for Low-Income Population

Can SNAP make a difference?

Seligman HK et al. Health Aff 2014;33:116-123
American Recovery & Reinvestment Act

Average monthly SNAP benefits per person, fiscal 1980–2015

May 2009-October 2013

Dollars


Inflation adjusted (2015 dollars)

Nominal

SNAP = Supplemental Nutrition Assistance Program.
$54 million averted

Emergency department and inpatient hospitalization costs only for commercially-insured adults between the ages of 19 and 64

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
$1,409 savings

Best estimate from three approaches showing similar effect sizes: standard regression, near/far instrumental variable analysis, and augmented inverse probability weighting.

Berkowitz, Seligman, Rigdon, Meigs, and Basu. *JAMA Int Med.* 2017
Why Paying for Nutrition Saves Money on Health Care

By Hilary K. Seligman, Seth A. Berkowitz, and Sanjay Basu  October 2, 2017

The foods we eat play a central role in our health. The epidemics of our time—obesity, heart disease, type 2 diabetes—are intimately tied to unhealthy patterns of eating. But we can't do anything about these links until we understand the roots of our poor nutrition. This is why nutrition science has become a public health priority. It's also why we've developed a new approach to nutrition education that emphasizes the importance of eating healthy foods, and includes strategies for how to do so.
California’s housing crisis is worsening hunger and health

BY HILARY SELIGMAN AND GEORGE MANALO-LECLAIR
Special to The Bee

NOVEMBER 22, 2017 01:00 PM
UPDATED NOVEMBER 25, 2017 06:25 AM
Why Talk About Costs?

• Hunger safety net designed to feed people, *not to save health care costs*
  – Strong incentives for health systems to reduce costs
  – Cost is a “common currency” that may align sectors: tension between traditional role of public health, health care, and social safety net

• Documenting excess health costs may support programs & policies
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Resources for Food Insecure Households

Federal Nutrition Programs

Charitable Feeding System

SNAP

Feeding America

CALIFORNIA WIC

EatSF
The Feeding America Network

200 MEMBER FOOD BANKS

1 NATIONAL OFFICE

+ 60K FOOD PANTRIES AND MEAL PROGRAMS

= 46M AMERICANS SERVED ANNUALLY
The Feeding America Network Serves Every County in the U.S.
Behavioral Economics in Food Pantries

• Attractive, organized, and full displays of fruits and vegetables
• Healthy foods displayed first, at eye-level, and in multiple places
• Unhealthy foods displayed in lower quantities
Policies
Make a Difference
Resources for Food Insecure Households

Federal Nutrition Programs

Charitable Feeding System

SNAP

CALIFORNIA WIC

FEEDING AMERICA

EatSF
“I wish everyone could be in this program.”

- EatSF Participant
“Triple Win”

Support Healthy Eating Habits

Drive Supply of F&V in Underserved Neighborhoods

Increase Food Security
We Are On the Right Track

• Individual participants
  • Increase F&V intake by 1 serving daily
  • More food secure
  • Greater confidence in making healthy food choices on a budget
  • Improved health & quality of life

• Vendors
  • New customers
  • Increased revenue: $800,000 since April 2015
  • Higher produce turnover, less food waste
Admissions for Low Blood Sugar Increase by 27% in Last Week of the Month for Low-Income Population

Seligman HK et al. Health Aff 2014;33:116-123
Strategic science with policy impact

Kelly Brownell & Christina Roberto, 2015

Identify change agents

Develop strategic questions

Scholarship

Communications
Two Policy-Relevant Questions

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<thead>
<tr>
<th></th>
<th>Weekly</th>
<th>Monthly</th>
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<tr>
<td>Target (F&amp;V only)</td>
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<td>Untargeted</td>
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Primary Outcome: Daily intake of F&V’s
Goal: Double intake from 0.7→1.4 cup-equiv per day
(meeting Healthy People 2020 goal)

Funding: NIH, 1R01HL132814 (Basu/Seligman)
Four Questions

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• If so, what are the economic implications?
• How can Strategic Science help us to make our research more impactful?
• How should we respond?
Four Questions

• Does food insecurity impact health?
• If so, what are the economic implications?
• How can Strategic Science help us to make our research more impactful?
• How should YOU respond?
Strategic science with policy impact

Kelly Brownell & Christina Roberto, 2015

1. Identify change agents
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advocacy
How should YOU respond?

• Farm Bill is enormously important for SNAP
  – Protect benefits; oppose “block grants”

• SNAP is the best answer...BUT benefits do not reach many, and are too low for many they do reach: support local initiatives

• Federal, state, and local policies can heavily influence food insecurity rates
Thank You!