Food Security & Food Access in Relation to Chronic Illness

Darcy Freedman, PhD, MPH
Case Western Reserve University, School of Medicine
Swetland Professor of Environmental Health Sciences
Professor, Population & Quantitative Health Sciences
Director, Mary Ann Swetland Center for Environmental Health

Objectives

By the end of this presentation attendees will be able to:

✓ Explain the relationship between food access, food security, and chronic disease risk.
✓ Describe best practices for evaluating individual and community risk for food insecurity.
✓ Identify evidence-based interventions to promote food security and nutrition equity.
Why focus on food security and food access?

10 Leading Causes of Death in United States, 2015

- Heart Disease, Cancer, Stroke, Diabetes
- Chronic Respiratory Disease
- Accidents
- Alzheimer's Disease
- Influenza & Pneumonia
- Kidney Diseases
- Intentional Harm

Relationship between attributable DALYs in 2016 & annualized rate of change in SEV (globally), both sexes combined, 1990–2016

DALY = disability adjusted life years
SEV = summary exposure value

Environmental = 35.7%
Behavioral = 48.2%
Metabolic = 16.1%

70% of behavioral are diet related

Lancet 2017; 390: 1345–422

Relationship between attributable DALYs in 2016 & annualized rate of change in SEV (globally), both sexes combined, 1990–2016

DALY = disability adjusted life years
SEV = summary exposure value

Environmental = 35.7%
Behavioral = 48.2%
Metabolic = 16.1%

70% of behavioral are diet related

Lancet 2017; 390: 1345–422
Definitions
Coleman-Jensen et al, 2018

• Food Secure:
  – All household members have access at all times to enough food for an active, healthy life

• Food Insecure
  – Households that are unable to acquire adequate food for one or more members because they had insufficient money and other resources for food
Definitions

Coleman-Jensen et al, 2018

• Food Secure:
  – All household members have access at all times to enough food for an active, healthy life

• Food Insecure
  – Households that are unable to acquire adequate food for one or more members because they had insufficient money and other resources for food

<table>
<thead>
<tr>
<th>Low Food Secure</th>
<th>Very Low Food Secure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households that avoided substantial reductions or disruptions in food intake, in many cases by relying on a few basic foods and reducing variety in their diets</td>
<td>Eating patterns of one or more household members were disrupted and their food intake reduced, at least some time during the year, because they could not afford enough food.</td>
</tr>
</tbody>
</table>

US Food Security Trends, 2017

<table>
<thead>
<tr>
<th>Food Secure</th>
<th>Low Food Secure</th>
<th>Very Low Food Secure</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Content is the property of the presenter. It may not be used or distributed without the presenter’s permission.
Highest Food Insecurity Rates by State (2014-16 Average)

Low and Very Low Food Secure


Mary Ann Swetland
Center for Environmental Health

Content is the property of the presenter. It may not be used or distributed without the presenter's permission.
Food Security Rates in 2016

<table>
<thead>
<tr>
<th>Food Security</th>
<th>Low Food Secure</th>
<th>Very Low Food Secure</th>
</tr>
</thead>
<tbody>
<tr>
<td>foodNEST Neighborhoods</td>
<td>Ohio</td>
<td>National</td>
</tr>
<tr>
<td>85%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>88%</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Sources:
- Ohio neighborhoods (St Clair-Superc, Cleveland & Southside, Columbus): Future of Food in Your Neighborhood Study (2016 data). N=450.

Zip Code > Genetic Code

Average Life Expectancy = 70 years

Average Life Expectancy = 83 years

Content is the property of the presenter. It may not be used or distributed without the presenter's permission.
Who is at increased risk for food insecurity?

Coleman-Jensen et al, 2018

- Households with incomes below 185% of the poverty threshold (30.8%)
- Households with children headed by a single woman (30.3%) or a single man (19.7%)
- Households headed by Black non-Hispanics (21.8%) and Hispanics (18.0%)
- Households with children under age 6 (16.4%)
- All households with children (15.7%)

What are some of the causes of food insecurity among children?

**Individual Factors**

- Unemployment or underemployment among caregivers
- Income instability among caregivers
  - Seasonal work
  - Other financial demands (e.g., housing, health care, utilities)
  - Loss of benefits
- Family crisis (e.g., drug use, domestic violence, incarceration)
- Housing instability
- Lack of engagement with childcare
- Immigrant status
- Disability

Gunderson & Ziliak, 2014
What are some of the causes of food insecurity among children?

**Community Factors**

- Low-access to stores selling nutritious foods
- Limited or no access to public transportation
- Low access to living wage jobs
- Poor quality education and training programs
- Unstable housing market

Renal Modified Nutrition Environment Measurement Survey (Renal-NEMS)

Sullivan et al., 2017

- Comply with renal diet standards and recommendations from National Kidney Foundation’s (NKF) Dietary Guidelines for Adults Starting on Hemodialysis
  - $<900$ mg of sodium for entrees and $<300$ mg of sodium for side dishes
  - No dry beans, high-potassium fruits, or high-potassium vegetables listed as the first, second, or third ingredient
  - No whole-grain flour listed as the first ingredient
  - Calcium content of $<20\%$ of the daily value
  - Low potassium fruits and vegetables
Access to Renal Diet in Greater Cleveland Sample of Stores

Table 1. Comparison of the Availability of Foods Compatible With a Renal Diet Versus an Unrestricted Diet Using the Nutrition Environment Measures Survey (NEMS)

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Number of Items for Unrestricted Diet</th>
<th>Mean Number of Items for Renal Diet</th>
<th>Difference Unrestricted Minus Renal</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>3.9 (0.3)</td>
<td>0.7 (0.3)</td>
<td>3.2</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Fruit</td>
<td>8.7 (1.6)</td>
<td>9.0 (1.2)</td>
<td>0.3</td>
<td>.04</td>
</tr>
<tr>
<td>Vegetables</td>
<td>10.0 (3.6)</td>
<td>9.8 (0.5)</td>
<td>0.2</td>
<td>.08</td>
</tr>
<tr>
<td>Ground beef</td>
<td>1.8 (0.9)</td>
<td>1.8 (0.8)</td>
<td>0.0</td>
<td>1.00</td>
</tr>
<tr>
<td>Hot dog</td>
<td>2.0 (0.3)</td>
<td>1.6 (0.5)</td>
<td>0.4</td>
<td>.92</td>
</tr>
<tr>
<td>Frozen dinners</td>
<td>2.7 (2.8)</td>
<td>0.8 (1.0)</td>
<td>1.9</td>
<td>.006</td>
</tr>
<tr>
<td>Baked goods</td>
<td>2.0 (0.9)</td>
<td>1.8 (0.4)</td>
<td>0.2</td>
<td>.17</td>
</tr>
<tr>
<td>Beverages</td>
<td>4.0 (0.3)</td>
<td>3.5 (0.9)</td>
<td>0.5</td>
<td>.05</td>
</tr>
<tr>
<td>Bread</td>
<td>2.0 (0.3)</td>
<td>1.8 (0.5)</td>
<td>0.3</td>
<td>.08</td>
</tr>
<tr>
<td>Chips</td>
<td>1.8 (0.4)</td>
<td>1.4 (0.5)</td>
<td>0.4</td>
<td>.02</td>
</tr>
<tr>
<td>Total</td>
<td>30.3 (4.3)</td>
<td>32.5 (4.7)</td>
<td>0.7</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Results are shown as means (standard deviations).
## Cost of Renal Diet in Greater Cleveland Sample of Stores

### Table 2. Comparison of the Cost per Serving of Foods Compatible With a Renal Diet Versus an Unrestricted Diet Using the Nutrition Environment Measures Survey (NEMS)

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Cost Per Serving, $ for Unrestricted Diet</th>
<th>Mean Cost Per Serving, $ for Renal Diet</th>
<th>Difference, $ Unrestricted Minus Renal</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>0.20 (0.02)</td>
<td>0.47 (0.05)</td>
<td>-0.27</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Fruit</td>
<td>0.70 (0.23)</td>
<td>0.75 (0.29)</td>
<td>-0.05</td>
<td>&lt;.04</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.43 (0.10)</td>
<td>0.38 (0.09)</td>
<td>0.05</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Ground beef</td>
<td>1.37 (0.40)</td>
<td>1.37 (0.40)</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Hot dog</td>
<td>0.33 (0.17)</td>
<td>0.48 (0.27)</td>
<td>-0.15</td>
<td>.004</td>
</tr>
<tr>
<td>Frozen dinners</td>
<td>3.43 (0.15)</td>
<td>3.18 (0.15)</td>
<td>0.25</td>
<td>.05</td>
</tr>
<tr>
<td>Baked goods</td>
<td>0.52 (0.10)</td>
<td>0.52 (0.12)</td>
<td>0.00</td>
<td>.91</td>
</tr>
<tr>
<td>Beverages</td>
<td>0.29 (0.08)</td>
<td>0.28 (0.10)</td>
<td>0.01</td>
<td>.71</td>
</tr>
<tr>
<td>Bread</td>
<td>0.14 (0.04)</td>
<td>0.16 (0.05)</td>
<td>-0.02</td>
<td>.009</td>
</tr>
<tr>
<td>Chips</td>
<td>0.38 (0.11)</td>
<td>0.31 (0.12)</td>
<td>0.07</td>
<td>.002</td>
</tr>
<tr>
<td>Total</td>
<td>5.67 (2.50)</td>
<td>5.75 (2.72)</td>
<td>-0.09</td>
<td>.48</td>
</tr>
</tbody>
</table>

Results are shown as means (standard deviations). Negative numbers in the difference column reflect a higher cost for renal diet food items.

---

**How do you feel when you are hungry?**

I'M SORRY for what I said when I was HUNGRY.

---

Content is the property of the presenter. It may not be used or distributed without the presenter's permission.
Consequences of Food Insecurity

*Pediatrics 2015*

- Impaired growth and development (e.g., physical, social, emotional)
- Increased risk for chronic disease (e.g., obesity, diabetes)
- Increased risk for mental health concerns
- Decreased adherence to medication and health maintenance
- Higher health care costs
- Missed school or work days --→ loss of income

Solutions to Promote Food Security & Nutrition Equity

Screening & Referral

Content is the property of the presenter. It may not be used or distributed without the presenter’s permission.
Food Security Screening & Referral

Hunger Vital Sign
Hager et al., 2010

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.”

Responses options: often true, sometimes true, or never true for our household

Hunger Vital Sign & Risk for Other Health Concerns

Children at risk of food insecurity had worse health outcomes.

Source: Children’s HealthWatch Data, 1998-2005. All increases statistically significant at p<0.05.
Hunger Vital Sign & Risk for Other Health Concerns

 Mothers at risk of food insecurity were in worse mental and physical health.

Mary Ann Swetland
Center for Environmental Health

Source: Children's HealthWatch Data, 1998-2005. All increases statistically significant at p<0.05.

OUR COMMUNITY
Free Produce Distribution on Our Main Campus

The MetroHealth System | Jun 17 2019

Content is the property of the presenter. It may not be used or distributed without the presenter's permission.
Other Referrals

- 211
- Local emergency food assistance
- Assess qualification for other benefits
  - Food assistance
  - Medicaid
  - Housing
- Training & employment

Solutions to Promote Food Security & Nutrition Equity
Federal Food Assistance Benefits

Learn more at https://www.fns.usda.gov/

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplemental Nutrition Assistance Program (SNAP, formerly food stamps)</td>
<td>Money to purchase food. The average benefit is about $127 per month per person.</td>
</tr>
<tr>
<td>Special Program for Women, Infants, and Children (WIC)</td>
<td>Money to purchase pre-specified foods for pregnant/postpartum women, infants, and children under the age of 5. Nutrition education and breastfeeding support also provided.</td>
</tr>
<tr>
<td>School Breakfast and Lunch Programs</td>
<td>Free or reduced price meals for income-eligible students of all ages.</td>
</tr>
<tr>
<td>Summer Meals Program for Children</td>
<td>Free healthy meals during the summer for students 18 and under.</td>
</tr>
</tbody>
</table>

Solutions to Promote Food Security & Nutrition Equity

Advocacy

Food Assistance Benefits

Screening & Referral

Content is the property of the presenter. It may not be used or distributed without the presenter's permission.
Farm Bill Advocacy

Solutions to Promote Food Security & Nutrition Equity

Content is the property of the presenter. It may not be used or distributed without the presenter's permission.
What are nutrition incentives?

✓ Provide subsidy to reduce food costs.

✓ Often target specific populations.

✓ Often restrict use to buy select food products.

“I know the food is worth the price. I just don’t have the money to buy it.”
Solutions to Promote Food Security & Nutrition Equity

Mary Ann Swetland
Center for Environmental Health

Content is the property of the presenter. It may not be used or distributed without the presenter's permission.
Solutions to Promote Food Security & Nutrition Equity

- Advocacy
- Food Assistance Benefits
- Nutrition Incentives
- Farmers Markets
- Community Ambassadors
- Screening & Referral

Mary Ann Swetland
Center for Environmental Health

FreshLink Ambassadors - Connecting residents to resources to improve public health. Learn more at: www.prchn.org
Solutions to Promote
Food Security & Nutrition Equity

Conclusions

- Assume food insecurity exists in your community.
- Develop methods for identifying risk.
- Collaborate with others on solutions.
- Evaluate and share your work so others can learn.
Thank you! Questions?

Mary Ann
Swetland
Center for Environmental Health

Darcy Freedman
daf96@case.edu
https://case.edu/swetland/