Food Insecurity and Healthcare Costs

Feeding a Healthy Future: Estimating the Health-related Costs of Food Insecurity

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Disclosure

- I have no actual or potential conflict of interest in relation to this program/presentation.
Overview

• About Children’s HealthWatch
• About Social Determinants of Health
• About Food Insecurity & Hunger
• Review: How Food Insecurity Affects Healthcare Costs
• How We Estimate Health-related Costs of Food Insecurity
• Implications for Health & Social Policy
About Children’s HealthWatch

- Non-partisan network of pediatric & public health researchers → research & policy center
- MISSION: Improve health & development of young children → public policies → alleviate family economic hardships
  - Hunger (Food Insecurity)
  - Unstable Housing (Housing Insecurity)
  - Trouble Keeping Heat or Lights on (Energy Insecurity)
  - Health care sacrifices; foregoing care, or foregoing other necessities
- Provide policy makers and others with evidence to develop policies that protect young children’s health and development
Where our data come from:

Frontline health care settings:

- Boston, Baltimore, Philadelphia, Little Rock and Minneapolis

- Household survey
- Interviews - caregivers with children 0 to 4 years old
  - “invisible” group
  - critical window of time
Urie Bronfenbrenner’s Ecological Model of Child Development:

- A “systems model” or approach,
- Sees children influenced by multiple overlapping systems,
  - The child’s “inner systems”
  - The parent’s
  - Other immediate family
  - Extended family
  - Community / neighborhood systems
  - Education / school systems
  - Town/city, state, national policy system

Adapted from Bronfenbrenner, 1998, p. 996.
Another view of the Ecological Model

- Child’s temperament
- Parenting style
- Parents’ physical & mental health
- Parents’ feeding behavior
- Parent-child interaction; “serve & return”
- Family support – other adults and children
- Community institutions – social capital
- Parents’ worklife – self-sufficiency
- Social supports / infrastructures
- Extent of connectedness
- Sense of shared values and purpose
About the US Healthcare System(s)

Payers
- Medicare & Medicaid, CHIP (Center for Medicare & Medicaid Services)
- State Health Insurance Programs (1115 Waivers, ACOs, etc.)
- Private Insurance Companies
- Out of Pocket Payments by Patients and their Families

Providers
- Individual clinicians
- Practices, Physician Groups, or Offices
- Clinics & Neighborhood Health Centers
- Individual Hospitals (Community, Not-for-Profit, Private for-Profit, Teaching Hospitals)
- Healthcare Networks or Systems (Multiple hospitals, offices, clinics, health centers, etc.)

The “covered” entity
- Patients & their families/households

Services
- Hospital inpatient services and specialty clinics,
- Ambulatory services (Doctor’s office visits, hospital outpatient visits, ED visits, Dental, Rx)
- Home health services
- Residential treatment facilities & services
The Affordable Care Act motivated and enabled serious recognition of Social Determinants of Health

- Factors other than healthcare determine a person’s health
  - Food Insecurity
  - Housing Instability
  - Household Energy Insecurity
  - Transportation
  - Neighborhood safety
  - Environmental conditions
  - Others – local, state, and national policies
➢ Health conditions and diseases – where, why, and how do they emerge?

➢ Treatment or care – what kind of service is needed? What kind is available?

➢ Who will provide the Tx or care?

➢ Who will pay for the Tx or care?

➢ Can the patient comply with Tx?
Nutritional Pathways
- Perinatal nutrition of mother and child, including internatal period
- Brain and cognitive development in the child (sensitive and vulnerable periods)
- Growth impacts (stunting, wasting, structural and system anomalies, endocrine system, obesity, oral health issues)
- Compromise of immune system functions (risks for infection-malnutrition cycle)
- Energy deficits
  - Compromised body temperature regulation
  - Reduced environmental exploration & learning
- Reduced likelihood of breastfeeding

Non-nutritional Pathways
- Adverse impacts on the child’s and mother’s mental health (depression) and adult-child interactions (impaired responsiveness, serve and return)
- Impoverished home environment and lack of appropriate stimulation and nurturing support
- “Toxic stress” (repetitive, persistent or inescapable acute or chronic stress; e.g., child abuse, domestic violence, recurrent or persistent hunger, poverty & food insecurity(?))
- Delays in and/or deterrence of needed medical care
- Non-compliance with treatment, including Rx
- Self-efficacy, aspirations, sense of worthiness
<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number of Individuals Food Insecure (1000s)</th>
<th>Percent of Individuals Food Insecure</th>
<th>Number of Individuals in Households With Low Food Security (1000s)</th>
<th>Percent of Individuals in Households With Low Food Security</th>
<th>Number of Individuals in Households with Very Low Food Security (1000s)</th>
<th>Percent of Individuals in Households with Very Low Food Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>36,229</td>
<td>12.2%</td>
<td>24,287</td>
<td>8.2%</td>
<td>11,942</td>
<td>4.0%</td>
</tr>
<tr>
<td>2008</td>
<td>49,108</td>
<td>16.4%</td>
<td>31,824</td>
<td>10.6%</td>
<td>17,284</td>
<td>5.8%</td>
</tr>
<tr>
<td>2009</td>
<td>50,162</td>
<td>16.6%</td>
<td>32,499</td>
<td>10.8%</td>
<td>17,663</td>
<td>5.9%</td>
</tr>
<tr>
<td>2010</td>
<td>48,832</td>
<td>16.1%</td>
<td>32,777</td>
<td>10.8%</td>
<td>16,055</td>
<td>5.3%</td>
</tr>
<tr>
<td>2011</td>
<td>50,120</td>
<td>16.4%</td>
<td>33,232</td>
<td>10.9%</td>
<td>16,888</td>
<td>5.5%</td>
</tr>
<tr>
<td>2012</td>
<td>48,966</td>
<td>15.9%</td>
<td>31,787</td>
<td>10.3%</td>
<td>17,179</td>
<td>5.6%</td>
</tr>
<tr>
<td>2013</td>
<td>49,078</td>
<td>15.8%</td>
<td>31,974</td>
<td>10.3%</td>
<td>17,104</td>
<td>5.5%</td>
</tr>
<tr>
<td>2014</td>
<td>48,135</td>
<td>15.4%</td>
<td>30,992</td>
<td>9.9%</td>
<td>17,213</td>
<td>5.5%</td>
</tr>
<tr>
<td>2015</td>
<td>42,238</td>
<td>13.4%</td>
<td>27,605</td>
<td>8.7%</td>
<td>14,663</td>
<td>4.6%</td>
</tr>
<tr>
<td>2016</td>
<td>41,204</td>
<td>12.9%</td>
<td>26,556</td>
<td>8.3%</td>
<td>14,648</td>
<td>4.6%</td>
</tr>
</tbody>
</table>
Is Food Insecurity an Important Social Determinant of Health?

1. Can food insecurity, or hunger, “cause” bad health outcomes?
2. Can bad health outcomes “cause” food insecurity, or hunger?
3. Can both be true? At different times? For different people?
4. Is food insecurity causally related to adverse health outcomes at all?
5. How could we determine that?
   • Randomized controlled trials (RCTs)?
   • Quasi-experimental methods?
   • Associational studies?
6. Does smoking tobacco “cause” lung, throat, or mouth cancers?
7. How could we determine that?
   • RCTs?
   • Quasi-experimental methods?
   • Associational studies?
Can we Assume that Food Insecurity is Causally Related to Adverse Health Outcomes?

✓ The evidence base for strong links between food insecurity and a large number of bad health conditions is large and strong,
✓ The potential benefits to be gained from assuming that food insecurity is causally related to adverse health outcomes, and treating it via social infrastructures such as SNAP, WIC, School Lunch & Breakfast Programs, & a strong private food assistance system are large and varied,
✓ The potential harm and costs of allowing food insecurity to persist, in terms of public health, civic strength, and participatory democracy are also very large and varied,
✓ We in Children’s HealthWatch have concluded the benefits to be gained from assuming food insecurity is causally associated with bad health conditions are far greater than the costs of not doing so.
Estimating Health-related Costs of Food Insecurity

- Assuming that food insecurity is causally related to adverse health conditions enables us to:
  - Estimate the proportion of cases of certain health conditions that are attributable to food insecurity, and
  - Estimate the cost savings that could be realized by eliminating food insecurity and its adverse impacts on health,
  - Treat food insecurity as the important social determinant of health that it in fact is, and
  - Inform policy decisions based on potential cost savings, and return on investments.
Estimating Health-related Costs of Food Insecurity: The Population Attributable Fraction (PAF)

In case-control studies, if adjusted odds ratios (ORs) are available, they can be transformed into relative risk ratios using formula 1 below:

\[
(1) \quad RR = \frac{OR}{1-Po + (Po \times OR)},
\]

where
- \( RR \) is the relative risk ratio,
- \( OR \) is the odds ratio, and
- \( Po \) is the proportion of the unexposed (food secure) who develop the outcome, or become cases.

\[
(2) \quad PAF = \frac{Pe (RR - 1)}{Pe (RR - 1) + 1} \times 100\%,
\]

where
- \( PAF \) is the excess population attributable fraction of disease in the population considered to result from the presence of the exposure variable or condition (i.e., food insecurity),
- \( RR \) is the relative risk ratio calculated as above, and
- \( Pe \) is the proportion of controls (those who do not have the outcome or disease) who were exposed (live in a food-insecure household).
Steps in the Estimation Process:
1. Review Empirical Literature for quantitative evidence of relationships between food insecurity and bad health conditions,
2. Where available, use Adjusted Odds Ratios, or Relative Risk Ratios, to estimate the PAF; the proportion of cases of a disease or condition in the population attributable to food insecurity (FI),
3. If possible, determine the total number of people diagnosed with the disease or condition each year, and
4. Using the PAF, estimate the number of cases attributable to FI,
5. If possible, determine the mean expenditures per person for those with any expenditures for treatment of the disease or condition,
6. Combine this information with the number of cases attributable to FI to estimate the total treatment costs attributable to food insecurity.
## Estimated Health-related Costs Attributable to Food Insecurity in 2014*

<table>
<thead>
<tr>
<th>Source of Cost</th>
<th>Costs ($Billion 2014 Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct health-related costs in 2014 based on new research evidence</td>
<td>$29.68</td>
</tr>
<tr>
<td>Non-overlapping direct health-related costs reported by Brandeis researchers in 2011, continued in 2014 and expressed in 2014 dollars</td>
<td>$124.92</td>
</tr>
<tr>
<td>Indirect costs of lost work time due to workers' illnesses or workers providing care for sick family members based on new research evidence</td>
<td>$5.48</td>
</tr>
<tr>
<td><strong>Total direct and indirect 2014 health-related costs</strong></td>
<td>$160.07</td>
</tr>
<tr>
<td>Indirect costs of special education in public primary and secondary schools, based on new research evidence</td>
<td>$5.91</td>
</tr>
<tr>
<td>Total costs of dropouts reported by Brandeis researchers in 2011, continued in 2014 and expressed in 2014 dollars</td>
<td>$12.94</td>
</tr>
<tr>
<td><strong>TOTAL ESTIMATED COSTS</strong></td>
<td><strong>$178.93</strong></td>
</tr>
</tbody>
</table>

*Source: Cook JT, Poblacion A. Bread for the World Institute, 2016 Hunger Report, Appendix 2.*
Prevalence of Food Insecurity has changed, but very little,
We have a better understanding of:

✓ Mental health costs, especially costs associated with depression,
✓ Relationship between reported health status and health services utilization and expenditures,
✓ The growth of literature and the evidence base each year, enables estimation of additional health-related costs attributable to food insecurity,
✓ The opioid epidemic and deaths of despair – how does FI fit?

The need for stronger evidence grows each year, as the Farm Bill debates approach, and as efforts to cut food assistance and other social infrastructures accelerates.
Thank You!

The mission of Children’s HealthWatch is to improve the health and development of young children by informing policies that address and alleviate economic hardships.

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