How To: Implement Rigorous Evaluation of Social Needs Interventions

#HowToWebinar
Evaluating Social Determinants of Health Interventions: A practical guide

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Disclosures

• I have no conflicts of interest to report
Goals

• Discuss considerations when deciding to evaluate social needs interventions
• Review pros and cons of common strategies for social needs interventions
Why Evaluate?

• Seems like a no-brainer: To know whether it’s working!
Why Evaluate?

• Seems like a no-brainer:
  – But consider (real) costs and time/opportunity cost
Why Evaluate?

• Seems like a no-brainer:
  – But consider (real) costs and time/opportunity cost
  – Also consider what you are evaluating:
    • Outcomes (no prior studies of intervention)
Why Evaluate?

• Seems like a no-brainer:
  – But consider (real) costs and time/opportunity cost
  – Also consider what you are evaluating:
    • Outcomes (no prior studies of intervention)
    • Process (not sure if intervention is ‘ready for prime-time’, or proven intervention and want to ensure fidelity)
How to Evaluate

– Considerations:
  • Data existing (retrospective) vs. need to collect (prospective)
How to Evaluate

– Considerations:
  • Data existing (retrospective) vs. need to collect (prospective)
  • Power: what effect size can we detect (related to sample size)
How to Evaluate

– Considerations:
  • Data existing (retrospective) vs. need to collect (prospective)
  • Power: how big of an effect can we detect (related to sample size)
  • Treatment assignment: randomized vs. not
Randomized Designs

– Treatment assignment occurs (somehow) at random
  • Guarantees lack of confounding (common causes of treatment and outcome, e.g. help-seeking behavior)
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  • Can be at level of individual, or other levels (visit, provider, service center)
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  • Does not have to include withholding intervention from some group—can test different versions of interventions
Randomized Designs

– Treatment assignment occurs (somehow) at random
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  • Can be at level of individual, or other levels (visit, provider, service center)
  • Does not have to include withholding intervention from some group—can test different versions of interventions
  • Also useful when resources insufficient to serve everyone
Randomized Designs

– Pros:
  • Strong evidence of causality (because no confounding)
  • Fair allocation of scare resources

– Cons:
  • Relatively more expensive
  • Can be time-consuming
  • More regulatory oversight
    – This protects both participants and investigators!
  • Loss to follow-up still a problem
Randomized Designs

Effects of Social Needs Screening and In-Person Service Navigation on Child Health
A Randomized Clinical Trial

Leanne M. Gottlieb, MD, MPH; Danielle Hesler, PhD; Donya Long, MD; Ellen Leves, MD; Abigail R. Burns, MD, MSW; Anaiz Amaya, BA; Patricia Sweeney, BA; Christine Schueller, MSW, MPH; Nancy L. Adler, PhD

**Importance** Social determinants of health shape both children's immediate health and their lifetime risk for disease. Increasingly, pediatric health care organizations are intervening to address family social adversity. However, little evidence is available on the effectiveness of related interventions.

**Objective** To evaluate the effects of social needs screening and in-person resource navigation services on social needs and child health.

**Design, Setting, and Participants** Patients were randomized to intervention or active control conditions by day of the week. Primary outcomes observed at 4 months after enrollment included caregivers' reports of social needs and child health status. Recruitment occurred between October 13, 2013, and August 27, 2015, in pediatric primary and urgent care clinics in 2 safety-net hospitals. Participants were English-speaking or Spanish-speaking caregivers accompanying minor children to nonacute medical visits.

**Interventions** After standardized screening, caregivers either received written information on relevant community services (active control) or received in-person help to access services with follow-up telephone calls for further assistance if needed (navigation intervention).

**Main Outcomes and Measures** Change in reported social needs and in caregiver assessment of child's overall health reported 4 months later.

**Results** Among 1809 patients enrolled in the study, evenly split between the 2 sites, 31.6% (n = 562) were enrolled in a primary care clinic and 68.4% (n = 1247) were enrolled in an urgent care setting. The children were primarily Hispanic white individuals (50.9% [n = 921]) and non-Hispanic black individuals (26.2% [n = 473]) and had a mean (SD) age of 5.1 (4.8) years. 50.5% (n = 913) were female. The reported number of social needs at baseline ranged from 0 to 12 of 14 total possible items, with a mean (SD) of 2.7 (2.2). At 4 months after enrollment, the number of social needs reported by the intervention arm decreased more than that reported by the control arm, with a mean (SE) change of -0.39 (0.13) vs 0.22 (0.13) (P < .001). In addition, caregivers in the intervention arm reported significantly greater improvement in their child's health, with a mean (SE) change of -0.36 (0.05) vs -0.12 (0.05) (P < .001).
Non-Randomized Designs

• Treatment assignment does not occur at random
  – Need to carefully construct control group to account for confounding
Non-Randomized Designs

• Treatment assignment does not occur at random
• Considerations:
  – Data on treatment assignment
  – Data on treated group prior to treatment
  – Data on treated group after treatment (including follow-up)
  – Data on comparison group prior to treatment
  – Data on comparison group after treatment (including follow-up)
Non-Randomized Designs

• Stronger designs:
  – Data on both treatment and comparison group before and after treatment
Non-Randomized Designs

• Stronger designs:

• Weaker designs:
  – data on treated group before and after, but no comparison
    • Pre/post
Non-Randomized Designs

• Stronger designs:
• Weaker designs:
  – data on treated group before and after, but no comparison
  – Data on treated and comparison after treatment assignment
  • Prevalent users
Stronger Non-Randomized Designs

• Pros:
  – Can adjust for confounding if good data
  – Individuals serve as own controls (for unchanging factors)
  – Able to estimate trajectories
  – Likely cheaper than randomized design
    • Possibly faster if retrospective

• Cons:
  – Unmeasured confounding
  – Data may not have been collected/available
Stronger Non-Randomized Designs

Meal Delivery Programs Reduce The Use Of Costly Health Care In Dually Eligible Medicare And Medicaid Beneficiaries
Pre/post Non-Randomized Designs

• Pros:
  – Likely least resource intense (only one group)
  – Fast (if retrospective)
  – Individuals serve as own controls (for unchanging factors)

• Cons
  – Confounding
  – No contemporaneous control group
  – Regression to the mean
    • Major issue for health services use/cost
  – ‘Secular trends’
Prevalent User Non-Randomized Designs

• Pros:
  – Feasible (usually more ‘prevalent’ than ‘incident’ users)
  – Fast (if retrospective)

• Cons
  – Unmeasured confounding
    • Bigger issue than in stronger non-randomized design as you do not have pre-treatment data
Prevalent User Non-Randomized Designs

Supplemental Nutrition Assistance Program (SNAP) Participation and Health Care Expenditures Among Low-Income Adults

Seth A. Berkowitz, MD, MPH; Hilary K. Seligman, MD, MAS; Joseph Righson, PhD; James R. Maigo, MD, MPH; Sanjay Ram, MD, PhD

IMPORTANCE Food insecurity is associated with high health care expenditures, but the effectiveness of food insecurity interventions on health care costs is unknown.

OBJECTIVE To determine whether the Supplemental Nutrition Assistance Program (SNAP), which addresses food insecurity, can reduce health care expenditures.

DESIGN, SETTING, AND PARTICIPANTS This is a retrospective cohort study of 4,447 noninstitutionalized adults with income below 200% of the federal poverty threshold who participated in the 2011 National Health Interview Survey (NHIS) and the 2012-2013 Medical Expenditure Panel Survey (MEPS).

EXPOSURES Self-reported SNAP participation in 2011.

MAIN OUTCOMES AND MEASURES Total health care expenditures (all paid claims and out-of-pocket costs) in the 2012-2013 period. To test whether SNAP participation was associated with lower subsequent health care expenditures, we used generalized linear modeling (gamma distribution, log link, with survey design information), adjusting for demographics (age, gender, race/ethnicity), socioeconomic factors (income, education, Social Security Disability Insurance disability, urban/rural, census region, health insurance, and self-reported medical conditions. We also conducted sensitivity analyses as a robustness check for these modeling assumptions.
Evaluation Take-aways

• Consider need for evaluation carefully
  – If proceed, commit to it (and budget for it)
  – Choose strongest feasible method
    • Often a stronger method is not much more work than a weaker method
Evaluation Take-aways

• Consider need for evaluation carefully

• Try to plan upfront
  – Can lead to design choices that make it much easier to evaluate
    • (e.g. collecting relevant data)
Evaluation Take-aways

- Consider need for evaluation carefully
- Try to plan upfront
- Randomize when feasible
Evaluation Take-aways

• Consider need for evaluation carefully
• Try to plan upfront
• Randomize when feasible
• Non-randomized:
  – Pay very close attention to constructing comparison group
Evaluation Take-aways

• Consider need for evaluation carefully
• Try to plan upfront
• Randomize when feasible
• Non-randomized:
  • Evaluation is a team-sport:
    – Solicit input from folks with lots of different
      backgrounds/perspectives
Thank You!

• Seth_Berkowitz@med.unc.edu
Caregiver Preferences for Food Insecurity Screening

Danielle Cullen, MD, MPH, MSHP
Pediatric Emergency Medicine Physician
Leonard Davis Institute Senior Fellow
The Children’s Hospital of Philadelphia
I have no financial relationships to disclose or Conflicts of Interests to resolve
Childhood Food Insecurity

20.9%
The Good…

- Resources
- Validated screening tool:

**The Hunger Vital Sign™**

Within the past 12 months:
- We worried whether our food would run out before we got money to buy more
- The food we bought just didn’t last and we didn’t have money to get more
Emphasis on addressing SDH

APA Task force on Childhood Poverty
A STRATEGIC ROAD-MAP

POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Promoting Food Security for All Children

COUNCIL ON COMMUNITY PEDIATRICS, COMMITTEE ON NUTRITION

Accountable Health Communities — Addressing Social Needs through Medicare and Medicaid

Dawn E. Alley, Ph.D., Chisara N. Asomugha, M.D., Patrick H. Conway, M.D., and Darshak M. Sanghavi, M.D.

To accelerate the development of a scalable delivery model for addressing upstream determinants of health, the Centers for Medicare and Medicaid Services recently announced a 5-year, $157 million test of a payment model called Accountable Health Communities.

January 7, 2016
DOI: 10.1056/NEJMmp1512532

Purchase this article
The Challenge…

- Multiple barriers to accurate responses
- Low participation in programs
- Role of the ED/acute care setting
Objectives

Estimate prevalence of FI in the ED
Objectives

- Estimate prevalence of FI in the ED
- Compare verbal vs tablet screening modality
Objectives

- Estimate prevalence of FI in the ED
- Compare verbal vs tablet screening modality
- Evaluate preferences in modality and location
Study Setting

Urban pediatric emergency department
- >99,000 visits annually
- Community hospital for West Philadelphia
- Quaternary care referral center
Study Design

- RCT with explanatory-sequential mixed method design

- Randomized to identical verbal or tablet based questionnaire:
  - Validated FI screening questions
  - Comfort with FI screen in ED
  - Comfort with FI screen at PCP
  - Preferred screening modality

- All participants received food resources
- Option: Direct connection to referral agency

Funded by the Leonard Davis Institute of Health Economics
Inclusion:
<18yo
Non-Critical Condition
English Speaking
Not Previously Enrolled

2154 Eligible
130 No Caregiver
1820 Randomized
204 Refused

<table>
<thead>
<tr>
<th>Top 4 Reasons</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not interested</td>
<td>73</td>
<td>36</td>
</tr>
<tr>
<td>Too stressed</td>
<td>48</td>
<td>24</td>
</tr>
<tr>
<td>About to be discharged</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td>Too tired/wants to rest</td>
<td>17</td>
<td>8</td>
</tr>
</tbody>
</table>
## Table 1: Demographics

<table>
<thead>
<tr>
<th></th>
<th>Verbal (N=910)</th>
<th>Tablet (N=908)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Age, y(SD)</strong></td>
<td>10.12 (6.9)</td>
<td>9.96 (6.9)</td>
</tr>
<tr>
<td><strong>Race, N(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaska</td>
<td>3 (0.3)</td>
<td>13 (1.4)</td>
</tr>
<tr>
<td>Asian</td>
<td>39 (4.3)</td>
<td>34 (3.8)</td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
<td>2 (0.2)</td>
<td>2 (0.2)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>397 (43.7)</td>
<td>367 (40.5)</td>
</tr>
<tr>
<td>White</td>
<td>383 (42.1)</td>
<td>400 (44.2)</td>
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<tr>
<td>More than one</td>
<td>29 (3.2)</td>
<td>35 (3.9)</td>
</tr>
<tr>
<td>Not listed</td>
<td>56 (6.2)</td>
<td>55 (6.1)</td>
</tr>
<tr>
<td><strong>Ethnicity, N(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>76 (8.4)</td>
<td>74 (8.2)</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>817 (90.0)</td>
<td>766 (84.5)</td>
</tr>
<tr>
<td>Unknown/Not Reported</td>
<td>15 (1.7)</td>
<td>66 (7.3)</td>
</tr>
<tr>
<td><strong>Level of Acuity, N(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (sickest)</td>
<td>1 (0.1)</td>
<td>3 (0.3)</td>
</tr>
<tr>
<td>2</td>
<td>332 (36.7)</td>
<td>308 (33.9)</td>
</tr>
<tr>
<td>3</td>
<td>447 (49.1)</td>
<td>478 (52.6)</td>
</tr>
<tr>
<td>4</td>
<td>120 (13.2)</td>
<td>116 (12.8)</td>
</tr>
<tr>
<td>5 (least sick)</td>
<td>8 (0.9)</td>
<td>3 (0.3)</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01
# Results: Screening Modality

## Rate of Reported FI by Screening Modality

<table>
<thead>
<tr>
<th></th>
<th>Verbal</th>
<th>Tablet</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Insecure N(%)</td>
<td>161 (17.7)</td>
<td>214 (23.6)</td>
<td>p=0.002</td>
</tr>
</tbody>
</table>

## Preferred Screening Modality by FI

<table>
<thead>
<tr>
<th></th>
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<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total N(%)</td>
<td>103 (16.9)</td>
<td>511 (83.2)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>N=614</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Insecure N(%)</td>
<td>25 (15.4)</td>
<td>265 (84.6)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>N=162</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOT Food Insecure N(%)</td>
<td>78 (17.3)</td>
<td>374 (82.8)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>N=452</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Results: Screening Location

### Comfort with FI Screen by Location

<table>
<thead>
<tr>
<th></th>
<th>ED</th>
<th>PCP</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total N(%)</strong> N=1818</td>
<td>1563 (86.0)</td>
<td>1457 (80.1)</td>
<td><strong>p&lt;0.001</strong></td>
</tr>
<tr>
<td><strong>Food Insecure N(%)</strong> N=375</td>
<td>291 (77.6)</td>
<td>265 (70.7)</td>
<td><strong>p=0.03</strong></td>
</tr>
<tr>
<td><strong>NOT Food Insecure N(%)</strong> N=1441</td>
<td>1272 (88.3)</td>
<td>1192 (82.7)</td>
<td><strong>p&lt;0.001</strong></td>
</tr>
</tbody>
</table>
## Results: Demographics by FI

<table>
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<td>11 (0.8)</td>
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<td>Asian*</td>
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<td>1 (0.3)</td>
<td>3 (0.2)</td>
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<tr>
<td><strong>Black/African American</strong>**</td>
<td>236 (69.2)</td>
<td>528 (36.7)</td>
</tr>
<tr>
<td>White**</td>
<td>74 (19.7)</td>
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<td><strong>Ethnicity, N(%)</strong></td>
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<tr>
<td>Hispanic or Latino**</td>
<td>51 (13.6)</td>
<td>99 (6.9)</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>298 (79.7)</td>
<td>1285 (89.2)</td>
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<tr>
<td>Unknown/Not Reported**</td>
<td>25 (6.7)</td>
<td>56 (3.9)</td>
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<td><strong>Level of Acuity, N(%)</strong></td>
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<td>2</td>
<td>141 (37.6)</td>
<td>501 (34.7)</td>
</tr>
<tr>
<td>3</td>
<td>173 (46.1)</td>
<td>752 (52.1)</td>
</tr>
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<td>4</td>
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<td>181 (12.5)</td>
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<td>6 (0.4)</td>
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*p<0.05,  **p<0.01
Results: Option for Direct Connection

375 screened positive for FI

196 (54%) opted in

74 (37%) reached

23 (31%) no longer interested

44 (59%) Pantry Connection

8 (11%) Federal Connection

115 voicemails

7 numbers disconnected
Conclusions

- Urban ED population may have **higher social risk** compared to general population
- Screening in ED is **acceptable** to families
- **Tablet-based screening** preferred method
- Need for **universal screening and intervention**
- Need for **effective intervention**
Next steps

Qualitative component to assess:

- Experience with screen
- Use of food assistance programs after referral
- Perceived usefulness of these programs
- Preferences in resource connection
Pearls for Social Needs Intervention

- Involve the target population early
- Allow the process to be iterative
- Consider sustainability in design
- Develop partnerships, and listen closely
Questions?

Danielle L Cullen
CullenDL@email.chop.edu
Questions?

#HowToWebinar

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company/root-cause-coalition/