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Identifying Positive Deviant Local Health Departments in Maternal and Child Health
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Identifying Positive Deviant Local Health Departments in Maternal and Child Health

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Research Objective

To identify and learn from LHD jurisdictions that perform better than expected in MCH outcomes compared to peers.
Framework: Positive Deviance

- Used to identify and learn from units that perform beyond expectations
- Defined by context
- Performance Improvement
Step 1:
Identify “positive deviants”, i.e., organizations that consistently demonstrate exceptionally high performance in an area of interest.

Step 2:
Study organizations in-depth using qualitative methods to generate hypotheses about practices that allow organizations to achieve top performance.

Step 3:
Test hypotheses statistically in larger, representative samples of organizations.

Step 4:
Work in partnership with key stakeholders, including potential adopters, to disseminate the evidence about newly characterized best practices.
Framework: Realist Evaluation (Pawson and Tilley)

**Context:** LHD environment (budget, population, geography)

**Mechanisms:** leadership, partnerships, service provisions

**Outcomes:**
- Teen pregnancy rates
- Low birth weight
- Pre-natal care
- Infant mortality rate

\[ C + M = O \]
Methods

• 2009-2010 Public Health Activities and Services Tracking (PHAST) data
  - WA (n=35), FL (n=67), NY [n=48 (excluded NYC and 9 additional LHDs)] uniquely detailed and matched annual MCH-related county-level expenditure data
C+M=O Variables

Context (Z) = those over which LHDs have no control
- population size
- geography
- budgets

Mechanisms (X) = Variables over which LHD leaders and boards have some internal control (X)
- assuring service through alternative providers in the community
- having a clinician as an LHDs “top executive”
- the types of services the LHD provides

Outcomes (Y)
- county-level rates of teen births
- late or no prenatal care
- infant mortality
- percent of low weight births
Methods: Quantitative

• **Step 1:** We regressed $y=\alpha + \beta_1 (Z) + e$ to identify high performers in each outcome taking into account local contextual factors.

• **Step 2:** We added in $X$ variables $Y=a+b1(Z) + b2(X)+e$ to assess how well the model fit when including LHD-controlled variables.

• **Step 3:** Likelihood ratio test to evaluate whether the inclusion of mechanism additional variables improved model fit.

# Positive Deviant Identification Regression Results

<table>
<thead>
<tr>
<th>State</th>
<th>Model Outcomes</th>
<th>R²</th>
<th>Likehood Ratio Test p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td>Florida</td>
<td>Teen pregnancy rate</td>
<td>0.65</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>Infant Mortality rate</td>
<td>0.23</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>Late or no prenatal care rate</td>
<td>0.10</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Low birth weight rate</td>
<td>0.45</td>
<td>0.52</td>
</tr>
<tr>
<td>New York</td>
<td>Teen pregnancy rate</td>
<td>0.50</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>Infant Mortality rate</td>
<td>0.32</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>Late or no prenatal care rate</td>
<td>0.55</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>Low birth weight rate</td>
<td>0.28</td>
<td>0.39</td>
</tr>
<tr>
<td>Washington</td>
<td>Teen pregnancy rate</td>
<td>0.82</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>Infant Mortality rate</td>
<td>0.22</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>Late or no prenatal care rate</td>
<td>0.33</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>Low birth weight rate</td>
<td>0.30</td>
<td>0.50</td>
</tr>
</tbody>
</table>
Results

- 50 positive deviant LHDs across 3 states:
  - WA = 10 (29%)
  - FL = 24 (36%)
  - NY = 16 (33%)

- 45 of 50 LHDs (90%) had better than expected MCH outcomes over 2 years,

- 25 LHDs (50%) had 2 or more exceptional outcomes in a single study year
# Results: MCH Expenditures – PDs and non-PDs

<table>
<thead>
<tr>
<th>State</th>
<th>LHDs</th>
<th>PDs (%)</th>
<th>Total Maternal Child Health Expenditures*</th>
<th>WIC Expenditures</th>
<th>Family Planning Expenditures</th>
<th>Maternal, Infant, Child and Adolescent Health Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>non-PDs</strong></td>
<td><strong>PDs</strong></td>
<td><strong>non-PDs</strong></td>
<td><strong>PDs</strong></td>
</tr>
<tr>
<td><strong>FL</strong></td>
<td>Rural</td>
<td>18 (27%)</td>
<td>7 (29%)</td>
<td>$5.78-35.67 (19.68)</td>
<td>$7.64-33.26 (22.71)</td>
<td>$0.21-21.20 (1.91)</td>
</tr>
<tr>
<td></td>
<td>Micro</td>
<td>10 (15%)</td>
<td>2 (8%)</td>
<td>$8.56-46.36 (20.80)</td>
<td>$28.05-36.26 (32.98)</td>
<td>$0.02-11.45 (4.80)</td>
</tr>
<tr>
<td></td>
<td>Metro</td>
<td>39 (58%)</td>
<td>15 (63%)</td>
<td>$7.26-27.69 (15.49)</td>
<td>$7.49-56.38 (16.93)</td>
<td>$0.11-15.01 (5.15)</td>
</tr>
<tr>
<td><strong>NY</strong></td>
<td>Rural</td>
<td>9 (19%)</td>
<td>4 (25%)</td>
<td>$0.25-14.06 (5.77)</td>
<td>$1.18-16.61 (7.94)</td>
<td>$0.87-0.76 (2.42)</td>
</tr>
<tr>
<td></td>
<td>Micro</td>
<td>13 (27%)</td>
<td>5 (31%)</td>
<td>$0.30-12.90 (2.56)</td>
<td>$1.38-20.55 (9.92)</td>
<td>$0.12-10.12 (3.28)</td>
</tr>
<tr>
<td></td>
<td>Metro</td>
<td>26 (54%)</td>
<td>7 (44%)</td>
<td>$0.02-13.70 (4.81)</td>
<td>$1.07-20.39 (7.50)</td>
<td>$0.07-0.77 (3.11)</td>
</tr>
<tr>
<td><strong>WA</strong></td>
<td>Rural</td>
<td>11 (31%)</td>
<td>3 (30%)</td>
<td>$3.44-32.20 (15.16)</td>
<td>$17.17-25.95 (21.22)</td>
<td>$0.86-8.76 (3.84)</td>
</tr>
<tr>
<td></td>
<td>Micro</td>
<td>11 (31%)</td>
<td>3 (30%)</td>
<td>$1.21-9.40 (5.77)</td>
<td>$2.36-6.21 (4.48)</td>
<td>$0.53-3.43 (2.90)</td>
</tr>
<tr>
<td></td>
<td>Metro</td>
<td>13 (37%)</td>
<td>4 (40%)</td>
<td>$0.82-27.52 (9.30)</td>
<td>$0.73-11.71 (7.32)</td>
<td>$0.47-0.49 (2.76)</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>Rural</td>
<td>38 (25%)</td>
<td>14 (28%)</td>
<td>$0.25-35.67 (15.44)</td>
<td>$1.18 - 33.21 (17.68)</td>
<td>$0.21-21.20 (2.56)</td>
</tr>
<tr>
<td></td>
<td>Micro</td>
<td>34 (23%)</td>
<td>10 (20%)</td>
<td>$0.30-46.36 (9.72)</td>
<td>$1.38 - 35.26 (13.05)</td>
<td>$0.11-11.45 (3.00)</td>
</tr>
<tr>
<td></td>
<td>Metro</td>
<td>78 (52%)</td>
<td>26 (52%)</td>
<td>$0.17-27.69 (10.50)</td>
<td>$0.73 - 56.37 (13.00)</td>
<td>$0.11-15.01 (3.64)</td>
</tr>
</tbody>
</table>
Next Steps

• Positive deviance can be used to ID high performers
• Mechanisms matter, but it is not clear how
• Conducting in-depth analysis to identify the *mechanisms* that lead to exceptional outcomes
Thank you!

- Robert Wood Johnson Foundation
- Research Assistants
  - Anjali Chainani, MPH, MSW & Athena Pantazis, MA, MPH
- Interviewees
- Advisory Council
  - Betty Bekemeier, PhD, MPH, FAAN
  - Barry Kling, MSPH
  - Michael Stoto, PhD
  - JoAnne Fischer
  - Carol Brady
Questions??