2-2-2015

Improving Measures of Public Health Activity at Local and State Levels: The Multi-Network Practice and Outcome Variation Examination Study (MPROVE)

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Improving Measures of Public Health Activity at Local and State Levels:

The Multi-Network Practice and Outcome Variation Examination Study (MPROVE)

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ASTHO Performance Policy Committee | 2 February 2015
Multi-Network Practice and Outcome Variation Examination Study (MPROVE)

- Identify implementation measures high-value services:
  - Chronic disease prevention
  - Communicable disease control
  - Environmental health protection

- Create registry of measures: consistent across communities

- Profile geographic variation in the delivery of selected public health services across local communities

- Decompose variation into attributable components:
  - need-sensitive or preference-sensitive factors
  - supply-sensitive factors

- Examine associations between service delivery & outcomes
Diffusion of Public Health PBRNs

- First cohort (December 2008 start-up)
- Second cohort (January 2010 start-up)
- Affiliate/Emerging PBRNs (2011-14)
### Participating MPROVE networks

<table>
<thead>
<tr>
<th>Network</th>
<th>State Agencies</th>
<th>Local Agencies*</th>
<th>Academic Units</th>
<th>Other</th>
<th>Total</th>
<th>Lead Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>1</td>
<td>55</td>
<td>2</td>
<td>15</td>
<td>73</td>
<td>Association</td>
</tr>
<tr>
<td>FL</td>
<td>1</td>
<td>67</td>
<td>3</td>
<td>3</td>
<td>74</td>
<td>Local agency</td>
</tr>
<tr>
<td>MN</td>
<td>1</td>
<td>75</td>
<td>1</td>
<td>1</td>
<td>78</td>
<td>State agency</td>
</tr>
<tr>
<td>WA</td>
<td>1</td>
<td>36</td>
<td>2</td>
<td>1</td>
<td>40</td>
<td>Local agency</td>
</tr>
<tr>
<td>NJ</td>
<td>1</td>
<td>100</td>
<td>2</td>
<td>1</td>
<td>104</td>
<td>Academic</td>
</tr>
<tr>
<td>TN</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>20</td>
<td>Academic</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td><strong>337</strong></td>
<td><strong>12</strong></td>
<td><strong>22</strong></td>
<td><strong>371</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Local Agencies includes Academic Units and Other.
**MPROVE measurement dimensions**

- **Availability/Scope:** specific activities produced
- **Volume/Intensity:** Frequency of producing activity over period of time
- **Capacity:** Labor and capital inputs assigned to an activity
- **Reach:** Proportion of target population reached by activity
- **Quality:** effectiveness, timeliness, equity of activity
- **Efficiency:** resources required to produce given volume of activity
Levels of Measurement

- **Community Level**: Includes services/activities regardless of who performs/contributes

- **Agency Level**: Focuses on activities directly contributed by governmental public health agency
Measure Selection Criteria

- Expected health impact
- Expected economic impact
- Control/influence by local public health agencies and their partners
- Pre-existing evidence of validity and reliability
- Feasibility of obtaining data
Example: Delphi Rating of Measures

Chronic Disease Measures: Feasibility x Health Impact Ratings

Feasibility

Health Impact
Final MPROVE Measures

- Chronic disease prevention (8 measures)
  - Tobacco prevention
  - Obesity prevention

- Communicable disease control (14 measures)
  - Immunization
  - Enteric disease control
  - STI control
  - Tuberculosis control

- Environmental health protection (5 measures)
  - Lead exposure protection
  - Food safety protection

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Analytic Methods

- MPROVE data linked with 2013 NACCHO Profile data on agency characteristics, and 2013 ARF data on community characteristics

- Hierarchical random and fixed effects models to identify patterns and correlates of variation

- Variance decomposition analysis to identify relative strength of institutional and community factors in explaining local variation
Proportion of local settings reporting MPROVE measures
### Local Health Department Resources Allocated to Promoting Physical Activity, Per Capita

<table>
<thead>
<tr>
<th></th>
<th>CO</th>
<th>FL</th>
<th>MN</th>
<th>NJ</th>
<th>TN</th>
<th>WA</th>
<th>6-States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>29%</td>
<td>35%</td>
<td>53%</td>
<td>52%</td>
<td>100%</td>
<td>67%</td>
<td>46%</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.07</td>
<td>0.03</td>
<td>0.00</td>
<td>0.00</td>
<td>0.17</td>
<td>0.10</td>
<td>0.00</td>
</tr>
<tr>
<td>25&lt;sup&gt;th&lt;/sup&gt; pctle</td>
<td>0.10</td>
<td>0.05</td>
<td>0.13</td>
<td>0.04</td>
<td>0.17</td>
<td>0.16</td>
<td>0.08</td>
</tr>
<tr>
<td>50&lt;sup&gt;th&lt;/sup&gt; pctle</td>
<td>0.47</td>
<td>0.24</td>
<td>0.33</td>
<td>0.08</td>
<td>0.17</td>
<td>0.31</td>
<td>0.19</td>
</tr>
<tr>
<td>Mean</td>
<td>5.30</td>
<td>0.80</td>
<td>1.30</td>
<td>0.54</td>
<td>0.17</td>
<td>0.57</td>
<td>1.52</td>
</tr>
<tr>
<td>75&lt;sup&gt;th&lt;/sup&gt; pctle</td>
<td>1.94</td>
<td>0.43</td>
<td>0.95</td>
<td>0.19</td>
<td>0.17</td>
<td>0.62</td>
<td>0.48</td>
</tr>
<tr>
<td>Maximum</td>
<td>47.11</td>
<td>5.29</td>
<td>18.37</td>
<td>8.96</td>
<td>0.17</td>
<td>2.27</td>
<td>47.11</td>
</tr>
</tbody>
</table>
Implementation of community-wide health education campaigns to promote physical activity

6 states
Implementation of clean indoor air policy enforcement activities

FL MN NJ TN WA 6-States Violations Investigations Citations/fines All Any

FL MN NJ TN WA 6-States
### Agency implementation of services/supports to reduce tobacco use and/or exposure

<table>
<thead>
<tr>
<th>Activity</th>
<th>CO</th>
<th>FL</th>
<th>MN</th>
<th>NJ</th>
<th>TN</th>
<th>WA</th>
<th>6-States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agencies providing tobacco services &amp; supports (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Educational materials</td>
<td>90%</td>
<td>89%</td>
<td>73%</td>
<td>80%</td>
<td>100%</td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>2 Educational media</td>
<td>56%</td>
<td>66%</td>
<td>40%</td>
<td>17%</td>
<td>100%</td>
<td>28%</td>
<td>41%</td>
</tr>
<tr>
<td>3 Cultural/linguistic specific materials</td>
<td>60%</td>
<td>62%</td>
<td>25%</td>
<td>41%</td>
<td>0%</td>
<td>31%</td>
<td>44%</td>
</tr>
<tr>
<td>4 Cultural/linguistic specific programs</td>
<td>60%</td>
<td>81%</td>
<td>48%</td>
<td>38%</td>
<td>100%</td>
<td>28%</td>
<td>52%</td>
</tr>
<tr>
<td>5 Educational/training programs</td>
<td>42%</td>
<td>45%</td>
<td>8%</td>
<td>16%</td>
<td>0%</td>
<td>10%</td>
<td>24%</td>
</tr>
<tr>
<td>6 Community development</td>
<td>37%</td>
<td>81%</td>
<td>48%</td>
<td>41%</td>
<td>100%</td>
<td>52%</td>
<td>51%</td>
</tr>
<tr>
<td>7 Policy development</td>
<td>44%</td>
<td>79%</td>
<td>56%</td>
<td>46%</td>
<td>50%</td>
<td>41%</td>
<td>53%</td>
</tr>
<tr>
<td>8 Policy implementation</td>
<td>44%</td>
<td>30%</td>
<td>--</td>
<td>45%</td>
<td>100%</td>
<td>41%</td>
<td>41%</td>
</tr>
<tr>
<td>9 Tobacco cessation programs</td>
<td>--</td>
<td>32%</td>
<td>--</td>
<td>9%</td>
<td>50%</td>
<td>17%</td>
<td>18%</td>
</tr>
<tr>
<td>10 Adult tobacco use surveillance</td>
<td>--</td>
<td>57%</td>
<td>--</td>
<td>13%</td>
<td>50%</td>
<td>28%</td>
<td>31%</td>
</tr>
<tr>
<td>11 Youth tobacco use surveillance</td>
<td>--</td>
<td>--</td>
<td>79%</td>
<td>12%</td>
<td>--</td>
<td>--</td>
<td>40%</td>
</tr>
<tr>
<td>Agencies providing all services/supports (%)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Agencies providing any of the services/supports (%)</td>
<td>94%</td>
<td>96%</td>
<td>96%</td>
<td>87%</td>
<td>100%</td>
<td>90%</td>
<td>92%</td>
</tr>
<tr>
<td>Average number of services/supports offered (mean)</td>
<td>4.33</td>
<td>6.21</td>
<td>3.77</td>
<td>3.57</td>
<td>6.50</td>
<td>3.59</td>
<td>4.29</td>
</tr>
</tbody>
</table>
Average FTE staffing for communicable disease intervention specialists per 100,000 population
Average completion time for enteric disease investigations

Completion time (days)

CO  FL  MN  NJ  TN  WA  6 states
Overall Patterns of Variation in Local Public Health Implementation

% of Total Variance

Estimates from random effects regression models
Correlates of Variation in Local Public Health Implementation

Estimates from state fixed-effects regression models
Preliminary Conclusions

- Wide variation in local availability of public health implementation measures
- Considerable within-state and between-state variation in implementation
- Patterns of variation are specific to domain & activity
- Institutional and community characteristics explain 30-50% of this variation
  - Harmful?
  - Wasteful?
  - Inequitable?
Additional Measure Validation

- Strong convergent and discriminant validity in 22 of 27 measures
- Moderate to strong predictive validity in 19 of 27 measures
- Problematic measures in tobacco, nutrition, physical activity are being revised and retested through follow-on study
Ongoing cross-state analyses

- Refining patterns & determinants of variation
  - Disentangling demand (need) from supply
  - System structure
  - Geospatial
  - Within and across domains of activity: composite measures

- Identifying population health correlates of variation
More information on the MPROVE Measures

MPROVE Final Measure Set
MPROVE Measure Specifications
MPROVE Research Protocol
MPROVE Data Acquisition Plan
MPROVE Measure Selection: Delphi Results
MPROVE Candidate Measure Inventory
MPROVE Measure Selection Criteria
MPROVE Comparative Report of Results
For More Information

Supported by The Robert Wood Johnson Foundation

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