Worth It? Quantifying the Value of Healthcare Preparedness Using the National Health Security Index

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Worth It? Quantifying the Value of Healthcare Preparedness Using the National Health Security Index

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Why a Health Security Index?

Track national progress in health security as a shared responsibility across sectors

- Identify strengths and vulnerabilities
- Detect gains and losses
- Encourage coordination & collaboration
- Facilitate planning & policy development
- Support benchmarking & quality improvement
- Stimulate research & innovation
**A Brief History**

- **2012**
  - **Collaborative Development**: CDC, ASTHO and >25 collaborating organizations

- **12/2013**
  - **1st Release**: Initial model structure and results
    - 5 domains and 14 subdomains
    - 128 measures

- **12/2014**
  - **2nd Release**: Revised model and results
    - 6 domains and 18 active subdomains
    - Measures: 119 retained + 75 new = 194 measures

- **1/2015**
  - **Transition to Robert Wood Johnson Foundation**
    - Validation studies and revision to methodology & measures

- **4/2016**
  - **3rd Release**: Revised model and results
    - 6 domains & 19 active subdomains
    - Measures: 65% retained, 12% respecified, 8 new = 135 total
    - Valid comparisons over time + confidence intervals

- **4/2017**
  - **4th Release**: Refined model and results
    - Added District of Columbia
    - Measures: 4 dropped, 7 respecified, 8 new = 139 total
### What the Index measures

<table>
<thead>
<tr>
<th>Health Security Surveillance</th>
<th>Community Planning &amp; Engagement</th>
<th>Incident &amp; Information Management</th>
<th>Healthcare Delivery</th>
<th>Countermeasure Management</th>
<th>Environmental &amp; Occupational Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Surveillance &amp; Epidemiological Investigation</td>
<td>Cross-Sector / Community Collaboration</td>
<td>Incident Management &amp; Multi-Agency Coordination</td>
<td>Prehospital Care</td>
<td>Medical Materiel Management, Distribution, &amp; Dispensing</td>
<td>Food &amp; Water Security</td>
</tr>
<tr>
<td>Biological Monitoring &amp; Laboratory Testing</td>
<td>Children &amp; Other At-Risk Populations</td>
<td>Emergency Public Information &amp; Warning</td>
<td>Inpatient Care</td>
<td>Countermeasure Utilization &amp; Effectiveness</td>
<td>Environmental Monitoring</td>
</tr>
<tr>
<td>Management of Volunteers during Emergencies</td>
<td>Legal &amp; Administrative</td>
<td>Long-Term Care</td>
<td>Non-Pharmaceutical Intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Capital &amp; Cohesion</td>
<td>Mental &amp; Behavioral Healthcare</td>
<td>Home Care</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Enhanced Methodology

- **139 individual measures**
- **19 subdomains**
- **6 domains**
- **State overall values**
- **National overall values**

- Normalized to 0-10 scale using min-max scaling to preserve distributions
- Imputations based on multivariate longitudinal models
- Empirical weights based on Delphi expert panels
- Bootstrapped confidence intervals reflect sampling and measurement error
- Annual estimates for 2013-2016

<table>
<thead>
<tr>
<th>Reliability by Domain</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health security surveillance</td>
<td>0.712</td>
</tr>
<tr>
<td>Community planning &amp; engagement</td>
<td>0.631</td>
</tr>
<tr>
<td>Incident &amp; information management</td>
<td>0.734</td>
</tr>
<tr>
<td>Healthcare delivery</td>
<td>0.596</td>
</tr>
<tr>
<td>Countermeasure management</td>
<td>0.654</td>
</tr>
<tr>
<td>Environmental/occupational health</td>
<td>0.749</td>
</tr>
</tbody>
</table>
Steady but slow progress

*statistically significant change
The U.S. improved in most domains during 2013-16, except healthcare delivery and environmental health

*statistically significant change
Geographic disparities in health security are large and persistent.

2017 Results

Above average  Within average  Below average  %Increase in year  %Decrease in year
Improvements occurred across the U.S., but 12 states trailed or lost ground
## Changes vary widely across states and domains

<table>
<thead>
<tr>
<th>Category</th>
<th>Lowest State</th>
<th>US Average</th>
<th>Highest State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Security Surveillance</td>
<td></td>
<td>US +9.7%</td>
<td>VT +11.1%</td>
</tr>
<tr>
<td>Community Planning &amp; Engagement</td>
<td></td>
<td>US +16.0%</td>
<td>VT +32.1%</td>
</tr>
<tr>
<td>Incident &amp; Information Management</td>
<td></td>
<td>US +2.5%</td>
<td>VA +7.9%</td>
</tr>
<tr>
<td>Healthcare Delivery</td>
<td></td>
<td>US +3.9%</td>
<td>NH +0.0%</td>
</tr>
<tr>
<td>Countermeasure Management</td>
<td></td>
<td>US +7.7%</td>
<td>CO +8.0%</td>
</tr>
<tr>
<td>Environmental &amp; Occupational Health</td>
<td></td>
<td>US −1.4%</td>
<td>VA +1.1%</td>
</tr>
</tbody>
</table>
Health security tracks closely with social & economic determinants of health

Percent of population below federal poverty threshold

Percent of population without health insurance coverage
Racial and ethnic inequities in health security

Percent of population residing in a state with below-average health security

2017 Results

21%* 8% 38%*

Relative Risk: *statistically significant difference
2017 Results

Rural-Urban differences in health security

Percent of population residing in a state with below-average health security

Relative Risk: 23%*

*statistically significant difference
Underlying drivers: occupational

Percent of workers with paid sick leave and telecommuting opportunities

*statistically significant change
Underlying drivers: organizational

Participation in Healthcare Preparedness Coalitions
Underlying drivers: community and systems

Communities with Strong Multi-Sector Networks (Comprehensive Public Health Systems)

2017 Results

*statistically significant difference
Closing gaps and inequities: Insights from the Index

- Build & connect existing networks and coalitions
- Engage the private sector
- Focus on low-resource states & settings
- Focus on stagnant and declining domains: healthcare & environmental
- Include insurance coverage as a security strategy
- Allow for flexibility in allocation and use of resources
Caveats and cautions

- Imperfect measures & latent constructs
- Missing capabilities
- Timing and accuracy of underlying data sources
Using the Index for Healthcare Preparedness

Suzet McKinney, DrPH, MPH
Illinois Medical District Commission
Using the Index for Healthcare Preparedness

Robert Burhans
Emergency Management Consultant
On the horizon

- Webinar series on Index use
- Preparedness Innovator Challenge
- Exploratory work to include territories and sub-state metropolitan areas
- Analyses to uncover causes and consequences of change in health security

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