Progress and Priorities for the National Health Security Preparedness Index

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Available at: https://works.bepress.com/glen_mays/319/
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Why a Health Security Index?

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

- Raise public awareness
- Identify strengths and vulnerabilities
- Detect gains and losses
- Encourage coordination & collaboration
- Facilitate planning & policy development
- Support benchmarking & quality improvement
- Stimulate research & innovation
Many attempts, Few successes

ASTHO Bioterrorism Accountability Indicators Project

CDC Public Health Preparedness & Response Capacity Inventory

Preparedness and Emergency Response Research Centers

Ready or Not

Improvements Needed for Measuring Awardee Performance in Meeting Medical and Public Health Preparedness Goals

GAO

MEASURING DISASTER PREPAREDNESS

FEMA Has Made Limited Progress in Assessing National Capabilities
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

Health Security Surveillance
- Health Surveillance & Epidemiological Investigation
- Biological Monitoring & Laboratory Testing

Community Planning & Engagement
- Cross-Sector / Community Collaboration
- Children & Other At-Risk Populations

Incident & Information Management
- Incident Management & Multi-Agency Coordination
- Emergency Public Information & Warning

Healthcare Delivery
- Prehospital Care
- Inpatient Care
- Long-Term Care

Countermeasure Management
- Medical Materiel Management, Distribution, & Dispensing
- Countermeasure Utilization & Effectiveness

Environmental & Occupational Health
- Food & Water Security
- Environmental Monitoring

Social Capital & Cohesion

Legal & Administrative

Mental & Behavioral Healthcare

Home Care
Enhanced Methodology

- 139 individual measures
  - 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

- 19 subdomains
  - Weighted average

- 6 domains
  - Weighted average

- State overall values
  - Weighted average

- National overall values
  - Unweighted average

<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.

<table>
<thead>
<tr>
<th>Overall*</th>
<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></td>
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</tbody>
</table>

2017 Results

*statistically significant change
Geographic disparities in health security are large and persistent.
Improvements occurred across the U.S., but 12 states trailed or lost ground

2017 Results

Below national average  Within national average  Above national average

% Change from 2015

2016 Index Value
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 +6.0%</td>
<td>VT +32.1%</td>
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<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>

Index Values in 2013 and 2016

1  2  3  4  5  6  7  8  9  10
Health security tracks closely with social & economic determinants of health

Percent of population below federal poverty threshold

Percent of population without health insurance coverage
Rural-Urban differences in health security

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

2017 Results

Relative Risk: 23%*

*statistically significant difference
Underlying drivers: organizational

Participation in Healthcare Preparedness Coalitions

- Hospitals
- EMS
- Emergency management
- Public health

2013 | 2014 | 2015 | 2016
---|---|---|---
0%  | 10% | 20% | 30%

2013 | 2014 | 2015 | 2016
---|---|---|---
50% | 60% | 70% | 80%

2013 | 2014 | 2015 | 2016
---|---|---|---
70% | 80% | 90% | 100%

2013 | 2014 | 2015 | 2016
---|---|---|---
80% | 90% | 100% | 110%

2013 | 2014 | 2015 | 2016
---|---|---|---
90% | 100% | 110% | 120%

PREPARED

NATIONAL HEALTH SECURITY PREPAREDNESS INDEX
Underlying drivers: occupational

Percent of workers with paid sick leave and telecommuting opportunities

*statistically significant change
Underlying drivers: community and systems

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

*statistically significant difference
Determinants of State Health Security: Federal Preparedness Spending and Coverage Gains

GEE panel regression estimates also controlling for state population size and density, poverty rate, educational attainment, state public health spending per capita, and time trends.
Next Challenge: Supporting Meaningful Use
If you build it, will they come?

- Substantial progress in media coverage & use
- Productive dialog with federal/policy stakeholders: CDC, ASPR, ASPE, GAO, OMB, NCSL
- BUT…Limited engagement with state preparedness officials
Current Engagement Mechanisms

- Call for new measures
- Monthly workgroup meetings: methods, communications
- Public comment period on suggested enhancements (Oct)
- Delphi survey on measure importance (Nov-Dec)
- Pre-release state preview period (March)
- Quarterly webinars
- Preparedness Innovator Challenge (March-June)
- Data download, listserv, blogs, twitter

To receive updates from the Health Security Index, email listserv@lsv.uky.edu with “Subscribe NHSPIndex” in the body

www.nhspi.org
Caveats and cautions

- Imperfect measures & latent constructs
- Unmeasured capabilities
- Timing and accuracy of underlying data sources
On the horizon

- Exploratory work to include territories and sub-state metropolitan areas
- Tools and applications to support Index use
- Analyses to uncover causes and consequences of change in health security
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Visit or join an Index workgroup at [http://nhspi.org/get-involved/](http://nhspi.org/get-involved/)
For More Information

National Program Office

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