A. The Index and Health Security

A1. What is the National Health Security Preparedness Index?

The National Health Security Preparedness Index (the Index) measures the nation's health security and preparedness –that is, the nation's ability to prepare for, respond to, and recover from large-scale health threats.

The Index analyzes important measures of preparedness to identify strengths and opportunities for keeping the nation safe, while also measuring the strength of the everyday systems that help keep people safe and healthy.

A2. What is national health security?

The National Health Security Strategy [URL: http://www.phe.gov/Preparedness/planning/authority/nhss/Pages/strategy.aspx] defines national health security as "a state in which the nation and its people are prepared for, protected from, and resilient in the face of health threats or incidents with potentially negative health consequences."

A3. Why do we need to measure health security preparedness?

Although much has been accomplished toward strengthening U.S. health security, each natural disaster, disease outbreak, or other crisis illustrates that gaps remain even as new threats to health security emerge. Measuring national health security generates knowledge to (1) guide quality improvement, (2) inform resource and policy decision making, (3) enhance collaboration and shared responsibility, and (4) advance the science of measuring health security preparedness.

A4. Does the Index provide a complete picture of health security and preparedness?

The Index measures health security from a broad, multi-sectoral perspective using more than 100 measures from more than 50 different sources; however, it is not a complete picture. Important capabilities are not fully reflected in the Index due to both data and measurement limitations. The Index remains a work in progress as preparedness science, measurement, and practice continue to develop and advance. To recommend additional data sources or participate in workgroup discussions to further improve the Index, visit [URL for Get Involved Page].

A5. How does the Index differ from other evaluations of public health and state readiness?

Responsibility for the nation's health security is shared among the many sectors that prepare for, respond to, and recover from health security threats. Drawing data from many sources, the Index provides a broad, multi-sectoral, multidimensional view of preparedness to date. It also is the first national Index that assesses U.S. health security by collectively measuring the preparedness of the states.

A6. Who developed the Index?

Development of the National Health Security Preparedness Index has been shared among multiple organizations and entities. The Centers for Disease Control and Prevention (CDC) initiated the Index and provided funding for its first two years. During this period, the Association of State and Territorial Health Officials led development of the first two Index releases, working with CDC, a multidisciplinary Steering Committee, workgroups, and task forces made up of 100 individuals representing more than 35 organizations who contributed to Index design, development, and implementation.

The Robert Wood Johnson Foundation, together with the University of Kentucky, now lead the collaborative process to annually refine the Index and better inform preparedness efforts.

Index development has been and continues to be a transparent process that includes continuous improvement, stakeholder involvement, and real-world experience. Feedback from many sectors has informed development of the current Index. Learn more at [URL: Get Involved page].

A7. How does the Index build a Culture of Health?

Building a Culture of Health in the U.S. includes building a culture of health security by preparing the nation to protect everyone from health threats when disasters and other crises occur. The Robert Wood Johnson Foundation's Action Framework [URL to Action Framework] stresses that preparedness and resiliency require strong collaboration across sectors and effective integration across health services and systems. By measuring the contributions of these multiple sectors and multiple health systems stakeholders to preparedness and health security, the Index suggests opportunities for collaboration and partnership to improve health, well-being, and security at national and state levels.

A8. How can stakeholders provide feedback on the Index?

All stakeholders can have a voice in shaping the future of the Index by:

- Sharing ideas through the Index website (www.nhspi.org) and participating in public workgroup meetings [URL: Get Involved page]
- Joining the Index mailing list to receive updates about the Index and hear about other opportunities to provide feedback
- Participating in Index related presentations and discussions at meetings and conferences

B. 2016 Index Results

B1. What is the 2016 Index score for the United States?

The national score is 6.7 out of 10. This represents a 3.6% improvement since the Index began three years ago and a 1.8% improvement from the previous year.

B2. What does this mean about the nation's state of health security preparedness?

Overall, the nation's health security preparedness is trending in a positive direction. The U.S. is particularly strong in *Incident and Information Management* and *Health Security Surveillance,* an effect of the collective policy decisions, research and evaluation, and investments made in these domains.

Data suggest that the areas where the nation needs improvement are in *Healthcare Delivery* and *Environmental and Occupational Health*.

B3. What is different about the 2016 Index?

The changes implemented in the 2016 Index now allow for comparing and tracking improvements over time. In addition to release of the 2016 Index, comparable annual results back to the baseline year of 2013 are available.

The 2016 Index retains the framework of the previous releases: it still includes 6 domains. There are now 19 sub-domains and 134 measures. Other changes include:

- Refining methods that allow for tracking improvements over time
- Adding new measures to better capture the fullest picture of preparedness across the U.S.
- Improving how overall and categorical scores are derived
- Streamlining some measures based on a lack of updated data, weak data validity, or because they were not reliable indicators of preparedness
- Highlighting foundational preparedness gains that have been achieved and should continue to be maintained. Such universally achieved strengths represent important gains in capacity and capability across the nation, and are foundational components of health security preparedness.

These updates to the 2016 Index provide greater clarity about strengths, weaknesses, improvements, and declines in health security preparedness over time. Details about 2016 changes are available at link to Summary of Changes doc.

C. Understanding State Results

C1. What does an Index result of 10 mean?

A result of 10 would mean the state has fully achieved all capabilities included in the Index. It is appropriate for states to strive for improvement along the Index spectrum toward and up to an achievement of 10 because all measures chosen are considered important components of health security and preparedness and reflect best practices around the country.

It should be noted that most measures in the Index do not have an evidence-based target or threshold defined. In these cases, the highest performing state value is used to define the target of 10. In some cases, outlier values have been removed before defining the highest performing value.

When interpreting Index results, it is also important to remember that some measures may be more important for a state to achieve than others, given specific hazards commonly faced by the state as well as the need to address them in locally relevant ways using resources available.

C2. Why are Index results not ranked by state?

Rankings can be misleading by obscuring the magnitude and significance of numeric Index results. When Index results are clustered or have compressed distributions, two states can have very similar Index values but have very different ranks. When comparing results over time, small changes in Index values can cause large changes in rank that may have little practical or statistical significance. For clarity and transparency, the Index reports actual numeric results rather than rankings.

C3. Why have the scores for 2013, 2014 changed?

The methodology used to calculate the 2016 Index also was retroactively applied to previous years, to obtain results that allow for comparison over time. These methodological changes are outlined at link to Summary of Changes doc and full details about Index methodology are available at link to Index 2016 Methodology doc.

C4. How do the Index results relate to large urban areas?

The Index is currently designed to measure health security and preparedness for each U.S. state and to compute national preparedness measures as aggregations of state measures. State-level data sources are the most consistently available sources across the nation. In the future, it may be possible to compute Index values for larger urban areas and for sub-state areas such as counties using a subset of Index measures constructed from data sources that include local-level data.

While data used in the Index applies to the state level, the domains, sub-domains and measures included in the Index are important at all levels of health security and preparedness practice. At each level, the Index can be a useful tool to explore variation across domains within the state, discuss where jurisdictions likely contribute to state results, discuss interrelationships between sectors, enhance understanding of the types of efforts needed to advance health security, and generate ideas on how to ensure the highest level of preparedness is achieved through intra- and multi-sectoral partnership and collaboration.

C5. Are rural states at a measurement disadvantage?

No. Measures, where applicable, account for population size and do not favor populous areas. Index results are meant to reflect realities in the state, including both strengths and gaps, factors the community can easily influence and improve, and factors that are more difficult to address and change. Collectively, the measures should accurately reflect both the state's health security and its preparedness. As such, Index results for rural states reflect the reality of having fewer resources than needed for optimum preparedness in some areas, as well as associated strong points in others.

C6. Are measures for which all states achieve the target value included in the Index?

A total of 18 measures are included in the Index as Foundational Capabilities, representing capabilities that are uniformly available in every state and firmly ingrained in practice.

C7. Why are the District of Columbia, Puerto Rico, tribes, and U.S. territories excluded from the Index?

Previous versions of the Index are state-centric and do not include the District of Columbia, Puerto Rico, tribes, or U.S. territories. However, future Index releases are expected to include Washington, D.C. Lack of data availability for tribes and U.S. territories may continue to constrain their representation in the Index.

D. Methodology and Data

Full details of Index Methodology available at link to INDEX 2016 Methodology doc.

D1. Where did the data in the Index come from?

The Index is built on measures from existing data sources; no primary data collection is used in constructing the Index. Hundreds of data sources were examined to produce the 2016 Index. The 134 measures selected are drawn from 58 sources. The Index uses the most recent data publicly available (and downloadable) at the time of data request. As a result, it is often the case that data lags behind the public release of reports by a year or more. Annual updates will be made with each new release.

D2. Why is some data 2 to 3 years old (or older) in the latest Index?

The Index uses existing data to avoid placing additional data-collection burdens on practitioners. There is typically a time lag between when measure sources collect and when they publish their data. Sometimes this time lag can span two or at most three years. Frequency of data updating and data access are both considered in measure selection.

D4. Is the Index a simple roll-up of PHEP and HPP performance measures?

No. The Index is much broader than the Public Health Emergency Preparedness (PHEP) Program and Hospital Preparedness Program (HPP) performance measures. The 2016 Index has 134 measures from 58 sources.

D5. Why calculate Index values?

Indices are widely used to extract and summarize meaningful information from multiple, often imperfect, data sources and measures. If well-constructed, an Index can provide a holistic or global characterization of a phenomenon – and allow users to see broad patterns and trends—that are impossible to see using individual measures. The advantages of an Index are especially large when individual measures have limitations and errors that make them, alone, inadequate or problematic for revealing meaningful patterns and trends. In the case of the Preparedness Index, the index values provide a numeric representation of the broad preparedness constructs and capabilities reflected in the Index domains and subdomains. Individual measures are imperfect representations of these constructs, but the subdomain, domain, and overall Index values provide more reliable and meaningful characterizations of the underlying (or "latent") constructs of preparedness.

D6. Are the measures weighted?

Each measure is assigned a weight based on expert panel ratings of how important the measure is to the capabilities represented in each Index domain and subdomain. These weights are used to combine individual measures into summary measures at the subdomain, domain, and overall level. This methodology ensures that more important measures receive more weight in the Index, and prevents measures from arbitrarily receiving more weight based purely on the number of measures included in each domain and subdomain. For more details, [URL: Methodology document].

D7. What is the utility of an individual measure versus the groupings of measures?

Indices are widely used to extract and summarize meaningful information from multiple, often imperfect, data sources and measures. If well-constructed, an Index can provide a holistic or global characterization of a phenomenon – and allow users to see broad patterns and trends—that are harder to see using only individual measures. The advantages of an Index are especially large when individual measures have limitations and errors that make them, alone, inadequate or problematic for revealing meaningful patterns and trends. In the case of the Preparedness Index, the index values provide a numeric representation of the broad preparedness constructs and capabilities reflected in the Index domains and subdomains. Individual measures are imperfect representations of these constructs, but the subdomain, domain, and overall Index values provide more reliable and meaningful characterizations of the underlying (or "latent") constructs of preparedness.

D8. How were the measures and Index Structure selected?

Measures were selected by stakeholders involved in prior Index releases and through a 2015 public call for new measures. All measures were selected with guidance from the National Quality Forum's measure selection criteria, which states that measures must be important to measure and report, include scientifically acceptable measure properties, and be both usable and feasible. Details on the National Quality Forum's measure selection criteria are available at [URL=link to NQF measure selection doc].

The Index structure remains the same as in the 2013 Index, which was developed by a broad collection of preparedness stakeholders. History and rationale for the Index design are available at [URL: link to Index 2016 Methodology doc].

D9. Why were some measures from the previous Index years dropped from the 2016 Index?

Forty-two measures included in the 2014 Index release were dropped from the 2016 Index for such reasons as a lack of updated data, weaknesses in validity and reliability as indicators of the preparedness domains and subdomains, and/or because they reflect capabilities that have been universally achieved.

D10. How is the Index being validated?

The Index began with face validation through stakeholder input from and extensive dialogue among health security and preparedness experts. The 2016 release of the Index has been validated for construct validity to ensure that component measures are reasonable representations of the preparedness constructs articulated in the six domains of the Index structure.

D11. How accurate is the Index?

Each measure included in the Index contains some amount of measurement error, and some measures also contain sampling error due to the data collection procedures utilized. The 2016 release of the Index calculates and displays **confidence intervals** for each national summary measure in order to reflect the level of measurement certainty surrounding these national estimates. The size of each confidence interval depends upon the number of individual measures used in constructing each summary measure, and upon the degree of variability in each individual measure.

D12. Who is accountable for Index results?

A Guiding Principle of the Index is that "responsibility for [the] nation's health security is shared among… all sectors and jurisdictions that work together to prepare for, respond to, and recover from health security threats." The structure of the Index emphasizes shared responsibility and relationship between the efforts of individuals, organizations, and sectors. Improving Index results requires the efforts of more than any one individual, organization, or sector.

D13. How will the Index model be improved over time?

Stakeholders from the many diverse sectors influencing health security (such as private sector and community-based organizations) are increasingly being engaged to continue strengthening Index content and structure.

Ongoing sensitivity analyses and model validation work will also strengthen the Index.

E. Using the National Health Security Preparedness Index

E1. How should the Index be used?

The Index aims to provide an accurate portrayal of the nation's health security using relevant, actionable information to help guide efforts to achieve a higher level of health security preparedness.

The Index is intended to be used to do the following:

- **Support quality improvement.** For example, the Index can be used to:
    - Enhance understanding of what influences health security and how the work of various sectors and components intersect
    - Galvanize action towards both strategic and operational quality improvement efforts
- **Inform resource and policy decisions.** For example, the Index can be used to:
    - Identify the types of efforts that must be both developed and sustained to support effective responses and resilient communities
    - Demonstrate how the quality of everyday systems influences disaster response capabilities
- **Enhance collaboration and strengthen shared responsibility.** The Index can be used to:
    - Foster new partnerships and build collaborations, emphasizing that responsibility for health security is shared across many sectors
- **Advance the science of measuring preparedness.** The Index can be used to:

- Serve as a call to action for improved data collection, more evidence-based targets, and research to identify the most effective approaches to strengthening health security preparedness

E2. Can the Index be used for trend analysis (year-to-year comparisons)?

Yes. The changes made to the 2016 Index methodology allow for trend analysis. These methodological changes were applied to the three previous years of Index production, allowing for trend analysis beginning at the baseline year (2013).

E3. How can individual states use their Index results?

The Index highlights strengths as well as systems gaps, and it can serve as a resource to facilitate quality improvement efforts. States can use the Index to drive dialogue around the domains, sub-domains, and relative importance of the measures in their state to mobilize improvement in areas that are important and can be realistically tackled. The Index is of practical use for both policymakers and practitioners.

E4. What does the Index mean for local health jurisdictions?

The Index is an important summary of state-level data that looks at overall progress toward national health security and preparedness. While variability within a state exists from community to community, the domains, sub-domains, and measures included in the Index are important at all levels of public health practice. At each, the Index can be a useful tool to explore variation across domains within the state, discuss where jurisdictions likely contribute to state results, discuss interrelationships among sectors, enhance understanding of the types of efforts needed to advance health security, and generate ideas on how to ensure the highest level of preparedness is achieved through partnership and collaboration.

E5. How can policymakers use the Index to inform resource and policy decisions?

National and state policymakers can use the Index to do the following:

- Understand what influences preparedness (domains, sub-domains, etc.)
- Identify domain and sub-domain gaps, strengths, and areas of greatest variability
- Learn what is needed to sustain existing health security strengths so they are in place for the next emergency
- Determine how an area compares with the national average and then dialogue with stakeholders to understand why
- Generate ideas with a spectrum of health security community partners on how to strengthen and maintain preparedness (e.g., who is involved and what is needed)
- Consider what policies and resource allocations would improve health security preparedness
- Track progress or decline in the nation's health security and preparedness over time

- Consider how earlier policy and resource decisions (or lack thereof) may have affected current status

E6. How can practitioners use the Index for quality improvement?

The Index supports quality improvement efforts and promotes an understanding of shared responsibility at both state and national levels. More specifically, practitioners can use the Index to do the following:

- Identify domain and sub-domain gaps, strengths, and areas of greatest variability
- Examine changes in strength over time within domains and subdomains
- Determine how the state compares to national averages
- Drive discussions to identify priority areas to address (e.g., strategic and operational planning)
- Consider availability of existing or potential future resources as well as partnerships that would support addressing these areas
- Generate discussion around the importance and best ways of maintaining areas of strength and improving areas of decline
- Consider partnerships with academic centers to determine most effective ways to address gaps and define reasonable and achievable measure targets
- Share effective practices with neighboring states facing similar threats and consider cross-state partnerships to address gaps
- Track and demonstrate progress made through funded efforts, expanded partnerships, etc.
- Highlight how the Index is being used to strengthen health security in media relations and other agency communications
- Support strategic planning, program development, and grant applications
- Identify missing areas in the 2014 Index that should be considered in future development

E7. How can researchers and academics use the Index to advance the science of measuring preparedness?

The Index serves as a call for filling gaps in measurement and improving measures of preparedness. Researchers and academics can develop:

- More science- and practice-based targets for existing measures
- Better measures and data collection systems
- Improved measurement methodology

- An improved understanding of what measures most accurately predict strong performance during an event
- Ways of helping practitioners identify and strengthen greatest gap areas.

E8. How can other stakeholders use the Index?

Data in the 2016 Index is meant to spark dialogue and collaboration with organizations beyond the traditional preparedness sectors of public health and emergency management. The Index can inform learning—it enables states and others to learn from each other. They can identify and replicate best practices and solution.

E9. How can communicators use the Index?

Communicators can use the Index to do the following:

- Expand public and partner understanding of the many factors that influence the nation's health security and preparedness
- Produce information graphics, written pieces, series, blog posts, videos, or podcasts emphasizing the importance of shared responsibility in advancing the nation's health security
- Raise visibility around areas of strength and share how progress has been made in recent years (share practices, examples, tools, and stories with organizations that collect and publish these on websites and in publications)
- Learn what it takes to maintain areas of strength and why doing so is important
- Generate discussion around gap areas and ways they can be addressed in states
- Seek out and tell stories demonstrating the importance of national health security and preparedness efforts (e.g., What is your community able to do since the release of the Index that it couldn't do previously? How are individuals, agencies, and sectors partnering to accomplish strengths and address gaps? What else is needed? Are any of a community's strengths in danger of diminishing? If so, why?)
- Highlight a domain or sub-domain in a newsletter, article, presentation, or interview by celebrating strengths (e.g., recognize and support the activities and partners that work together to maintain or advance strengths), and identifying gaps (e.g., work to engage applicable entities in sharing responsibility for and addressing gaps)

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