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## Summary of Results from the 2016 National Health Security Preparedness Index

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## 2016 SUMMARY OF RESULTS

The National Health Security Preparedness Index tracks the nation's progress in preparing for, responding to, and recovering from disasters and other large-scale emergencies that pose risks to health and well-being in the United States. Because health security is a responsibility shared by many different stakeholders in government and society, the Index combines measures from multiple sources and perspectives to offer a broad view of the health protections in place for nation as a whole and for each U.S. state. The Index identifies strengths as well as gaps in the protections needed to keep people safe and healthy in the face of disasters, and it tracks how these protections vary across the U.S. and change over time. Results from the 2016 release of the Index, containing data from 2013 through 2015, reveal that preparedness is improving overall, but protections remain uneven across the U.S., and they are losing strength in some critical areas.

### Key Findings

- **Steady national progress:** The U.S. consistently improved its ability to prepare for and respond to disasters and other large-scale health emergencies over each of the last three years, with the Preparedness Index reaching its highest level of 6.7 out of 10 in 2015. This result represents a 1.8% improvement from the previous year, and a 3.6% improvement from 2013.
- **Strong response management:** The nation's greatest strength in preparedness lies in incident command, the ability to follow a standardized approach in managing the response to emergency events. Research shows that strong incident command leads to faster response times, fewer errors, and more efficient use of resources. Preparedness in this domain reached 8.4 in 2015, significantly higher than any other area monitored in the Index. These results reflect years of national focus on training government agencies, health professionals and community leaders in the incident command process and in practicing these skills regularly through exercises, drills and real events.
- **Gains in community resiliency:** The largest gains in preparedness occurred in an area of persistent weakness for the nation as a whole, that of *community planning and engagement*. Historically, the U.S. has struggled in its ability to develop supportive relationships among government agencies, community organizations, and individual residents and to develop shared plans for responding to emergencies. Research shows that relationships connecting people and organizations together can make communities more resilient to disasters; however, this domain stood out as the nation's weakest area of preparedness in the 2013 Index. Results from the 2016 Index, however, show that preparedness in this area has improved 8.4% by 2015, more than any other domain monitored in the Index. If maintained over time, these improvements will protect more people from adverse health consequences when disasters occur.
- **Losing ground in environmental monitoring:** The nation lost ground in its ability to monitor environmental hazards and maintain the security and safety of water and food supplies in recent years. Preparedness levels for environmental and occupational health fell by 4.5% between 2013 and 2015. These losses pose challenges for the nation in detecting and responding to environmental risks on a timely basis, as exemplified by events like the recent water contamination crises in Michigan and West Virginia.
- **Geographic variation in preparedness:** The nation's health protections are not distributed evenly across the U.S., with a preparedness gap of 36% between highest and lowest states in 2015. Maryland achieved the nation's highest overall preparedness level of 7.6 in 2015, 14% higher than the national average. A total of 18 states achieved preparedness levels that significantly exceeded the national average in 2015, with many of these leading states located along the Eastern seaboard or clustered in the Upper Midwest and Southwestern U.S. Conversely, 16 states lagged significantly below the national preparedness level in 2015, including clusters of states in the Deep South and Mountain West regions. Some states with comparatively low levels of preparedness are located in geographic regions that face elevated risks of disasters, indicating a need for focused improvements in high-risk and low-resource areas.
- **Large and persistent state gaps:** State-level differences in preparedness were largest in the environmental and occupational health domain. The leading state achieved a preparedness level 2.9 times higher than the lowest state in 2013, and this gap widened to 3.4 by 2015. Gaps between the highest and lowest states also exceeded 2.0 for community planning and engagement and for healthcare delivery. Large differences in preparedness across states weaken national preparedness by limiting the ability of state, federal and local stakeholders to work together and share information and resources, a function known as interoperability. These preparedness gaps are particularly troubling because they leave some communities more vulnerable to disasters and emergencies than others, contributing to inequities in population health and well-being. The Index results suggest a need for sustained national efforts focused not only on improving preparedness

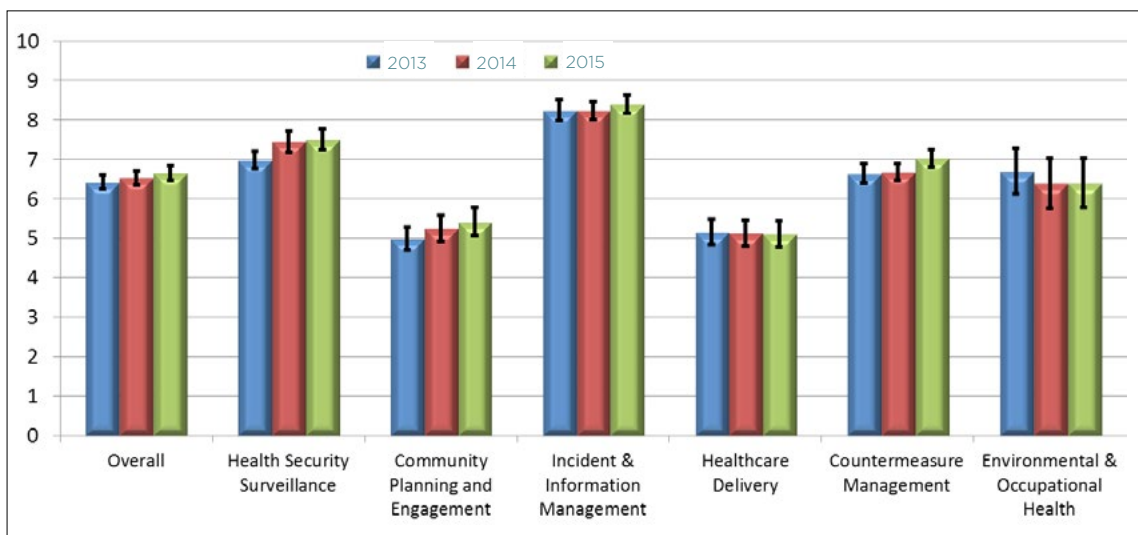
levels overall, but also on closing gaps in preparedness across states and communities.

- **Encouraging state trends:** Most states are moving in the right direction, with preparedness levels trending upward for all but 4 states in the Index results from 2013 to 2015. Most of these improvements were relatively modest, but 5 states experienced large gains in preparedness of more than 7.5% (one standard deviation), indicating a statistically meaningful change. Ohio achieved the largest improvement of any state over this period, with

a 9.1% gain that brought the state in line with the national preparedness level by 2015. A total of 5 states achieved gains in preparedness during 2013-15 that significantly outpaced the improvements of the nation as a whole. Conversely, 5 states that were significantly above the national preparedness level in 2013 fell significantly below this level by 2015. States that have improved and fallen behind in preparedness during recent years offer valuable laboratories for learning about specific practices and policies that can strengthen health protections and resiliency across the nation as a whole.

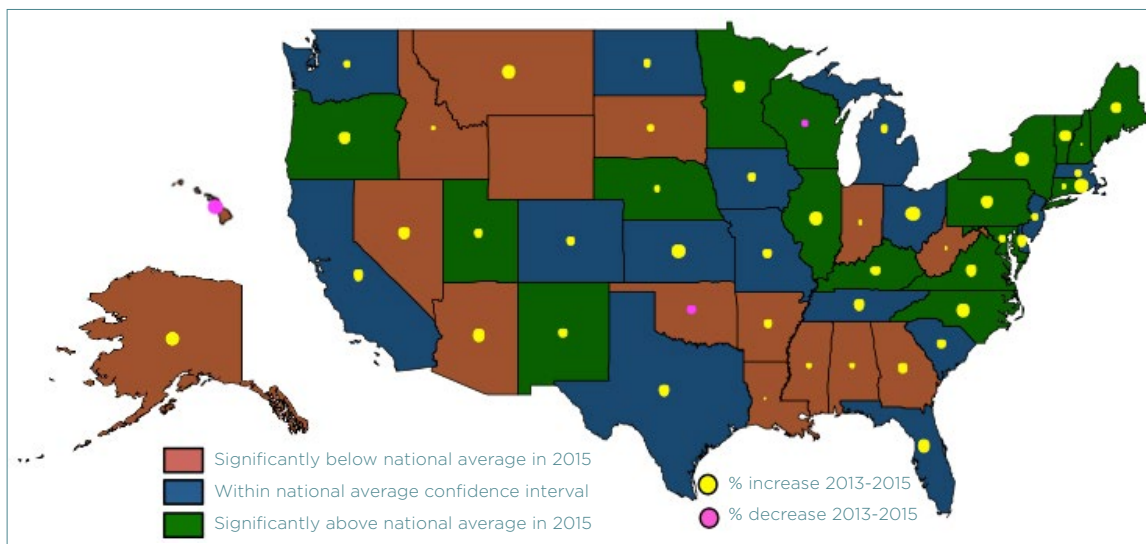
## A Closer Look at Index Results

### 1. National preparedness trended upward in most functional areas during 2013-15, except in environmental health and in healthcare delivery.



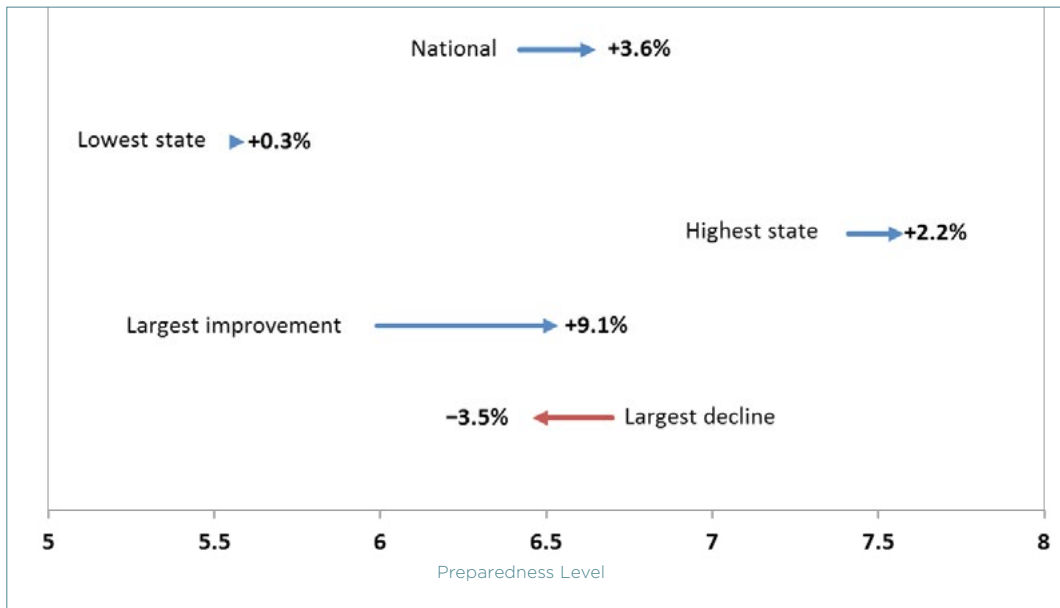
Source: 2016 National Health Security Preparedness Index. Vertical lines indicate confidence intervals.

### 2. Preparedness improved in most states during 2013-15, but significant geographic differences remain. Gaps in the Deep South and Mountain West are particularly large.



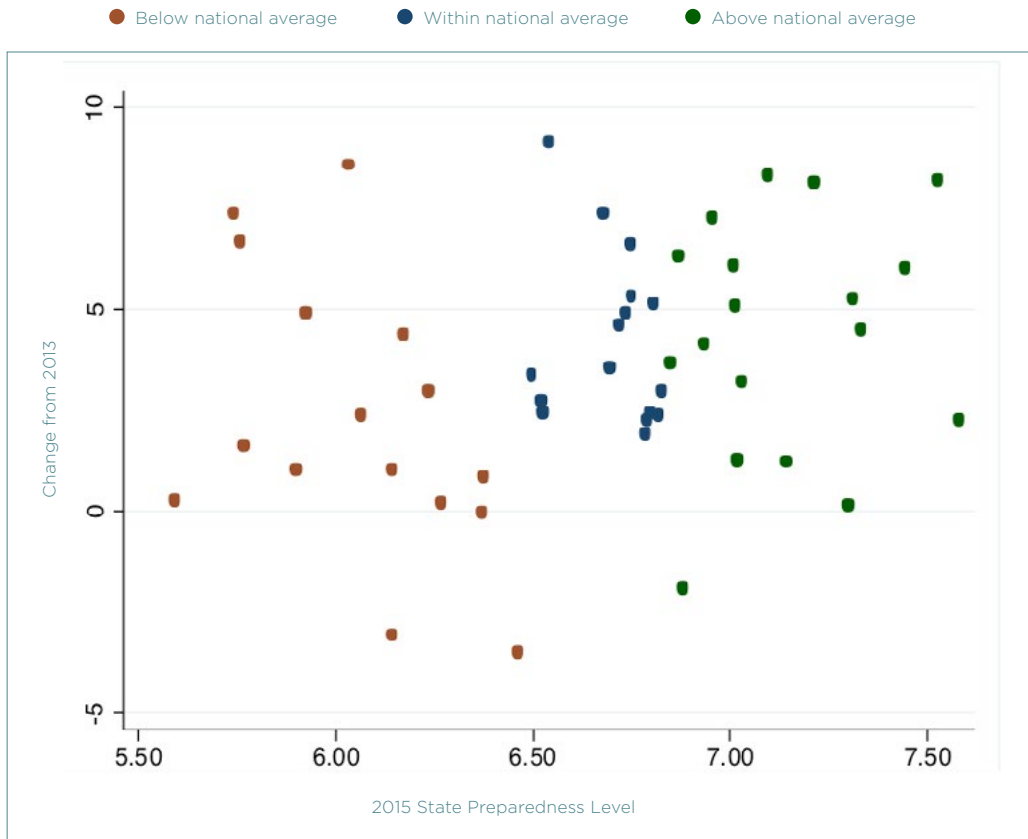
Source: 2016 National Health Security Preparedness Index. Circles are proportional to relative changes in each state.

**3. Preparedness levels improved by an average of 3.6% between 2013 and 2015. Individual state trends ranged from a 9.1% improvement to a 3.5% decline.**



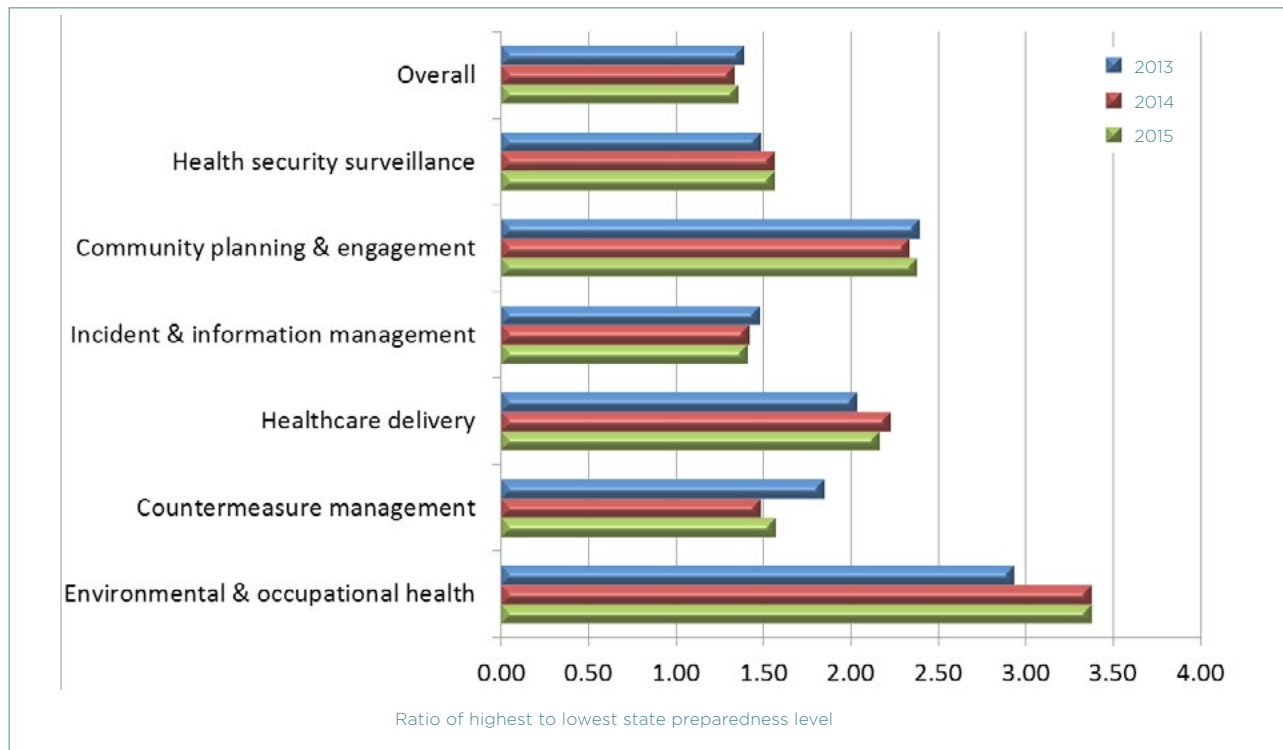
Source: 2016 National Health Security Preparedness Index.

**4. Preparedness improved across the U.S. in both above-average and below-average states. However, some below-average states continued to lose ground.**



Source: 2016 National Health Security Preparedness Index. Each dot represents one state.

**5. Gaps in preparedness between the highest and lowest states are large and persistent, and they have increased in environmental health and in healthcare delivery.**



Source: 2016 National Health Security Preparedness Index.

## About the Index

The 2016 Index is the third in a series of annual releases of data and analysis on national preparedness. The first two Index releases in December 2013 and December 2014 were supported by the U.S. Centers for Disease Control and Prevention and developed through a collaborative effort of more than 30 organizations led by the Association of State and Territorial Health Officials (ASTHO), the Oak Ridge Associated Universities (ORAU), the University of Pittsburgh Medical Center, and Johns Hopkins University. This work generated broad stakeholder input that created the Index’s overall design and structure, and demonstrated the overall utility of the Index as a measurement tool. In January 2015, responsibility for the Index transferred to the Robert Wood Johnson Foundation, and key enhancements were made to the Index measures and methodology to extend its utility as a measurement tool. Results from the 2016 Index are not directly comparable to prior releases of the Index; however, the 2016 Index release includes results for three consecutive annual periods dating back to 2013, thereby allowing for valid comparisons over time.

## Index Content and Structure

The 2016 Index measures more than 130 individual capabilities that research and experience have shown to be important in protecting people from the health consequences of disasters and other large-scale hazards and emergencies. Because no single agency or organization has the ability to support all of

the protections necessary to keep people safe and healthy in the face of these events, the Index reflects preparedness as a responsibility shared by many different stakeholders in government and society. Correspondingly, the Index combines measures from more than 50 different data sources and from multiple sectors in order to offer a broad view of the preparedness levels achieved for the nation as a whole and for individual U.S. states.

The Index measures are grouped into one of six domains representing broad areas of preparedness activity:

- 1. Health security surveillance:** actions to monitor and detect health threats, and to identify where hazards start and spread so that they can be contained rapidly;
- 2. Community planning and engagement:** actions to develop and maintain supportive relationships among government agencies, community organizations, and individual households; and to develop shared plans for responding to disasters and emergencies;
- 3. Information and incident management:** actions to deploy people, supplies, money and information to the locations where they are most effective in protecting health and safety;
- 4. Healthcare delivery:** actions to ensure access to high-quality medical services across the continuum of care during and after disasters and emergencies;

**5. Countermeasure management:** actions to store and deploy medical and pharmaceutical products that prevent and treat the effects of hazardous substances and infectious diseases, including vaccines, prescription drugs, masks, gloves, and medical equipment; and

**6. Environmental and occupational health:** actions to maintain the security and safety of water and food supplies, to test for hazards and contaminants in the environment, and to protect workers and emergency responders from health hazards while on the job.

The Index further divides these six domains into a total of 19 subdomains reflecting specific areas of practice and policy. Individual measures are rolled up into summary measures for each of the 19 subdomains, and then combined into summary measures for each of the 6 domains and an overall Index composite measure. All summary measures are scaled along a range from 0 to 10, with 10 representing the highest level of preparedness. The Index produces summary measures for each of the 50 U.S. states individually, and for the nation as a whole. In this third annual release, the 2016 Index includes annual measures for the years 2013, 2014 and 2015.

## Index Methodology

Construction of the 2016 Index began with a pool of more than 200 individual measures identified by stakeholders involved in prior releases of the Index, and supplemented by a public call for new measures held during 2015. We used a series of measurement validity and reliability tests to weed out redundant measures and measures lacking a strong empirical association with the Index domain and subdomain areas. Measures for which updated data could not be obtained at least every 3 years for each U.S. state were also eliminated from the Index. The resulting set consisted of 134 individual measures, including a group of 18 measures defined as Foundational Capabilities because

they reflect activities that are firmly ingrained in practice in all U.S. states and therefore do not vary across states or over time. Collectively, these measures provide a broad, multi-dimensional and multi-sectoral assessment of health security and preparedness. However, the Index may not reflect all important elements of preparedness due to the limitations inherent in existing measures and national data sources.

We convened expert panels to determine how much weight to give to each individual measure when rolling them up into summary measures for subdomains, domains, and the overall Index. Experts rated each measure based on its importance to health security and preparedness capabilities represented in each Index subdomain and domain. Before combining measures, each measure was standardized to a common scale using the min-max normalization method, and missing values were imputed using a regression-based multiple imputation method. Weighted averages were used to construct summary measures at the subdomain, domain, and overall Index levels for each state and each year. Foundational Capability measures were constructed as constants and averaged into the domain and overall summary measures using expert panel weights. State measures were then averaged to construct summary measures for the nation as a whole. All summary measures are scaled along a range from 0 to 10, with 10 representing the highest level of preparedness. Confidence intervals were estimated around each national summary measure in order to identify which states fall above, below, or in-line with the national measures. The time frame for each measure reflects the most recent data available for that year, which varies depending on the measure and its data source. One year differences in Index values may be conservative estimates of change because the data for some measures are updated every 2 or 3 years rather than annually.

For more information and full Index results, visit the National Health Security Preparedness Index website at [www.nhspi.org](http://www.nhspi.org).

## Acknowledgements

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