

Preparedness Index Methodology for 2016

The 2016 National Health Security Preparedness Index uses an enhanced methodology that improves upon the validity and reliability of results offered in previous releases of the Index. The enhanced methodology ensures that individual measures do not have a disproportionate impact on the Index results due purely to their scaling and position within the Index, while also allowing Index results to be tracked and compared validly across years. Because of these changes in methodology, the 2016 Index results are not directly comparable to results from previous releases of the Index. However, the 2016 Index includes annual results for a three year time period spanning 2013 to 2015, allowing users to track progress over time.

Key Changes for 2016

- **Normalization:** Each individual measure is normalized to a standard ten-point scale using the min-max method that preserves the full distribution of each measure and prevents categorical measures from having a larger impact on Index results compared with continuous measures.
- **Weighting:** 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.
- **Missing values:** Missing values for individual measures are estimated using a statistical imputation method that uses current and past values of multiple Index measures, along with state characteristics, to generate accurate estimates. This method greatly improves upon the accuracy of the imputations used in prior Index releases.
- **Longitudinal comparisons:** For the first time, the 2016 Index includes annual results for each of the years 2013 through 2015 using a standard methodology, allowing results to be trended and compared over time.
- **Confidence intervals:** For the first time, the 2016 Index estimates confidence intervals around each of the national summary measures. These intervals allow users to determine whether state results are significantly above, below, or in line with national norms.
- **Streamlined Index content:** The 2016 Index is constructed from a total of 134 individual measures, down from nearly 200 measures included in the 2014 Index release. Measures were eliminated from the 2016 Index if updated data were not collected at least every 3 years. Additionally, 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. Validation results show that the streamlined 2016 Index performs just as well as larger previous versions of the Index in estimating state and national preparedness levels, while offering more precise estimates that facilitate comparisons across domains, geographic areas, and time periods.