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Summary of Proposed Updates to the National Health Security Preparedness Index for 2015-2016

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NATIONAL HEALTH SECURITY PREPAREDNESS INDEX



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Summary of Proposed Updates to the National Health Security Preparedness Index for 2015-2016

Final Version for Public Comment

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BACKGROUND

The U.S. Centers for Disease Control and Prevention (CDC) initiated development of the National Health Security Preparedness Index in 2012 to create a platform for measuring the nation's progress in preparing for, responding to, and recovering from disasters and other large-scale emergencies that pose risks to health and wellbeing in the United States. As a measurement tool, the Index is designed to summarize levels of preparedness achieved within individual states and for the nation as a whole, with the goal of disseminating and using this information for multiple purposes: (1) to enhance public awareness and understanding of national preparedness components and capabilities; (2) to encourage coordination and collaboration among the multiple sectors and stakeholders that contribute to preparedness capabilities; (3) to inform planning, policy development, and quality improvement activities across the preparedness field; and (4) to stimulate and guide future research on how to measure and improve preparedness and health security.

Supported by CDC, the Index was developed through a broad collaboration of stakeholders led by the Association of State and Territorial Health Officials (ASTHO), the Oak Ridge Associated Universities (ORAU), the University of Pittsburgh Medical Center's Center for Biosecurity, and Johns Hopkins University's Center for Public Health Preparedness. More than 30 additional organizations have contributed to development of the Index, including federal state, and local public health agencies, emergency management agencies, health care organizations, research institutions, and professional associations. Developed as an annual measurement tool, the first edition of the Index was released in December 2013, and a second edition was released in December 2014. The current, second edition of the tool includes a total of 197 measures drawn from more than 40 data sources. The measures are aggregated into domain and subdomain composite measures, and further aggregated into an overall preparedness measure, based on conceptual framework of preparedness developed for the Index.

In January 2015, responsibility for publishing and maintaining the Index transitioned from CDC to the Robert Wood Johnson Foundation (RWJF). RWJF selected a Program Management Office based at the University of Kentucky's Center for Public Health Services and Systems Research and Center for Business and Economic Research to lead efforts to refine and update future editions of the Index. The Robert Wood Johnson Foundation also appointed a 14-member National Advisory Committee for the Index to provide overall scientific and strategic guidance regarding the Index design, operation and use. Additionally, the Program Management Office established three Workgroups to provide operational advice on future updates and revisions to the Index, drawing from a workgroup structure used during development of earlier editions of the Index. These workgroups convene monthly via teleconference and annually in person to address the following tasks:

- The Model Design Workgroup develops recommendations for refining and updating the conceptual model of health security and preparedness that provides a theoretical and structural foundation for the Index. The workgroup ensures that key constructs related to health security, preparedness and resiliency are reflected in the Index's domains, subdomains and individual measures.
- The Analytic Methodology Workgroup develops recommendations for validation studies to be performed on the Index, and identifies strategies for enhancing the scaling, grouping, weighting, imputation, risk-adjustment, analysis, and comparison of measures included the Index.
- The Stakeholder Engagement and Communications Workgroup develops recommendations for identifying and engaging high-priority end-users of the Index and creating tailored messages,

materials and channels for reaching these relevant stakeholders. The workgroup identifies strategies for enhancing the accessibility, usability, and utility of the Index for preparedness stakeholders.

Each workgroup includes 10-15 members, and all workgroup meetings are open for public participation from additional stakeholders interested in contributing comments and recommendations about Index refinements.

The objective of this report is to summarize the set of proposed updates to the Index methodology and measures that are recommended for implementation with the release of the 3rd edition of the Index. Public comments about these recommendations will be solicited over a 30 day period after the release of this report. All comments received will be reviewed by the Program Management Office and assessed for their potential to improve the Index methodology and measures proposed for use in the 3rd release and subsequent editions of the Index. Comments will be assessed for their expected impact on: (1) the validity, reliability, and comprehensiveness of preparedness measures reflected in the Index; (2) the accuracy and relevance of comparisons made across preparedness domains, subdomains, states, and years; (3) the usability and utility of the Index for key stakeholders in preparedness policy, practice and research; and (4) the feasibility of implementing improvements with the time, resources, data, and technology available for production of the 3rd edition of the Index. Comments deemed not to be feasible for incorporation into the 3rd edition of the Index will be considered for incorporation into subsequent versions of the Index.

METHODS

Upon release of the second edition of the Index in December 2014, the Index Program Management Office initiated a series of activities to examine the existing measurement properties of the Index and to identify strategies for improving the Index as a measurement tool. The aims of these activities were threefold: (1) to determine the construct validity and reliability of the Index domains and subdomains in order to identify strategies for improving these measurement properties; (2) to determine the accuracy of comparisons made across Index domains and subdomains and across states in order to identify strategies for improving the accuracy of comparisons; and (3) to determine valid and feasible methods for supporting longitudinal comparisons of Index values so that changes in preparedness over time can be accurately tracked.

Four sets of activities were completed in pursuit of these aims:

- (1) We conducted measurement validity and reliability analyses that examine the performance of existing Index measures in characterizing core preparedness constructs reflected in Index's conceptual framework, including the Index domains and subdomains. These analyses include (a) internal consistency reliability tests performed at the subdomain, domain, and overall Index level; and (b) multi-trait scale analysis tests performed at the subdomain and domain levels.¹
- (2) We conducted sensitivity analyses that examine the relative influence of each measure on overall Index results, including the impact of the Index's methods for scaling, imputing, and aggregating individual measures into subdomains, domains, and overall Index values.

¹ Staiger D, Dimick JB, Baser O, Fan Z and Birkmeyer JD. Empirically derived composite measures of surgical performance. *Medical Care* 2009;47: 226-233. Hays RD, Hayashi T. Beyond internal consistency reliability: rationale and user's guide for multitrait analysis program on the microcomputer. *Behavioral Research Methods* 1990;22(2):167-75.

- (3) We solicited ideas for new and modified measures to include in the Index through an Open Call for Measures and through monthly Index Workgroup meetings with content experts and stakeholders in the preparedness field.
- (4) We assessed the availability, completeness, quality, timeliness, and longitudinal consistency of data sources for existing and proposed new Index measures, including whether data sources are updated at least every three years.²

The results of these activities were discussed and refined with preparedness experts and stakeholders during monthly Index Workgroup meetings and during quarterly meetings of the National Advisory Committee. Based on this feedback, the Program Management Office drafted a set of recommended changes to the Index measures and methodology that are proposed for implementation as part of the 3rd edition of the Index. Proposed changes were developed with the following broad goals for methodological refinement in mind:

- Improve the methods used for grouping and weighting individual measures within domains and subdomains so as to improve the internal consistency and discriminant power of the Index.
- Consolidate and simplify the overall Index set of measures by reducing unreliable and noisy measures that have high levels of measurement error.
- Expand the breadth and composition of the Index by adding new measures reflecting important dimensions of preparedness and resiliency not currently represented in the Index, including measures that align with established national frameworks for preparedness and health security, such as the National Health Security Strategy and the preparedness objectives of Healthy People 2020.
- Improve the methods used for scaling individual measures so as to more accurately reflect the distributional properties of the measures and to enable more accurate comparisons across states and over time.
- Improve the accuracy of the methods used for imputing missing values for Index measures.
- Incorporate new data and analytic methods that allow for accurate comparisons of Index values over time (trending).

Results of validity and reliability tests were combined with findings from the data source assessments in order to develop a detailed recommendation about the status of each of the 197 individual measures included in the 2014 release of the Index. For each of these measures, we recommend one of several possible actions: (a) retain the measure as specified on the 2014 Index; (b) modify the way the measure is specified and calculated in order to improve its validity and/or reliability; (c) reclassify the measure into a different domain and/or subdomain in order to improve the validity and reliability of the underlying domain and/or subdomain composite measure; or (d) exclude the measure from the next edition of the Index. Measures are recommended for exclusion only if they fail multiple tests of measurement value, including: (i) the measure performs poorly on construct validity and reliability tests at both the domain and subdomain level, as indicated by an adjusted multi-trait item-to-scale correlation coefficient of less

² This criterion for data source periodicity and timeliness is based on the National Quality Forum's measure selection criteria.

than 0.3;³ (ii) the measure's construct validity and reliability does not improve when reclassified into another domain or subdomain scale; (iii) the measure's validity and reliability has not been established through previously published studies; and (iv) the measure is constructed from a data source that has not been updated within a 3 year periodicity period. By design, these criteria for measure selection and retention place priority on measures that help the Index discriminate preparedness levels across different domains and subdomains, across U.S. states, and across years.

RECOMMENDATIONS

Two types of recommendations are summarized in this report: (1) general changes to the computational methods used in calculating Index values; (2) specific changes to individual measures used within the Index, including measure exclusions, additions, and modifications.

1. Recommendations on Computational Methods

Recommendation 1: Measure Scaling and Normalization: The Index transforms each measure to a normalized scale before combining measures into subdomain, domain, and overall composite measures of preparedness. Normalization improves the validity and reliability of composite measures by placing component measures on a common scale before combining them. The 2013 and 2014 releases of the Index used a normalization methodology for continuous measures that expresses each value as a proportion of the maximum value observed for that measure, after trimming (Winsorizing) any maximum values that exceed 2.5 standard deviations of the measure. In many cases, this method of normalization distorts significantly the distribution of the original measure because it does not incorporate information on the measure's variance or range into the scaling. For the Index, this scaling method has the additional, unintended effect of making dichotomous measures much more influential in the Index compared to continuous measures, because continuous measures are normalized to restricted ranges that are much less likely to contain values at or near zero. To address these distortions in scaling, we recommend adopting an alternative method of scaling that normalizes each measure to a common 0-1 range based on the full range of original data values. This method, known as Min-Max scaling, calculates normalized values using a method that preserves the relationships among the original data values, as follows:

$$\text{Standardized Value} = (\text{Original Value} - \text{Minimum Value}) / (\text{Maximum Value} - \text{Minimum Value})$$

This method assigns each continuous and dichotomous variable to a common 0-1 scale based on the range of observed values, placing both types of variables on equal footing when aggregating them into subdomain and domain measures.⁴ Outlier values will be assessed on a case-by-case basis and truncated only when values fall outside plausible ranges. This normalization method is similar to the z-score in its distributional properties but produces more stable values than the z-score when used in small samples, as is the case with the Index's 50 state sample size.

³ We use a relatively weak correlation threshold of 0.3 given the relatively constrained degrees of freedom available for an Index measure in any given year (maximum n=50). See for example: Staiger D, Dimick JB, Baser O, Fan Z and Birkmeyer JD. Empirically derived composite measures of surgical performance. *Medical Care* 2009;47: 226- 233. Hays RD, Hayashi T. Beyond internal consistency reliability: rationale and user's guide for multitrait analysis program on the microcomputer. *Behavioral Research Methods* 1990;22(2):167-75.

⁴ Organization for Economic Cooperation and Development. *Handbook on Constructing Composite Indicators*. Paris: OECD and European Commission; 2008.

Recommendation 2: Measure Weighting: The 2013 and 2014 releases of the Index use the linear (unweighted) average as the method of aggregating individual measures into subdomain measures, aggregating subdomain measures into domain measures, and aggregating domain measures into the overall composite index of preparedness. This method implicitly assigns greater weight to measures located within subdomains and domains having fewer measures. As a result, large differences exist in the relative influence of each measure on overall Index results, and the most influential measures may not be the measures that are considered to be the most important to preparedness and national health security.

To address this distortion in implicit weighting, we recommend using an expert panel methodology to develop and assign explicit weights to Index measures for use in constructing subdomain, domain, and overall preparedness composite measures. We propose to use an online multi-stage Delphi process for this purpose. A separate expert panel will be convened for each domain included in the Index model, with each panel comprised of 15-20 subject matter experts who will be identified through a nomination process and reviews of the preparedness scientific and professional literature. Electronic Delphi surveys will be used to elicit expert ratings of (1) the importance of each measure to the capability construct reflected in each subdomain, and (2) the importance of each subdomain to the capability construct reflected in each domain. Visual analog scales (VAS) will be used to elicit expert ratings of importance on an interval scale, following methods that are well established for expert panel weighting processes.⁵ To test the sensitivity of expert opinions to alternative risk and hazard profiles, panelists will be asked to rate importance using three alternative national planning scenarios (biological disease outbreak, natural disaster, and terrorism) and also using an all-hazards scenario. Three iterations of Delphi surveys and feedback reports will be used with each panel in an effort to achieve convergence on expert ratings of importance. As a final step in the process, the domain-specific expert panels will be combined into a single composite panel for eliciting expert ratings on the relative importance of each domain to overall national preparedness and health security. Expert rating VAS values will be normalized using intra-rater z-scores to account for differences in the anchoring points used by individual panelists. Weights for individual measures, subdomains, and domains will be assigned to the median normalized VAS values. Collectively, these Delphi methods will produce an explicit and transparent weighting methodology for the Index based on a composite of expert ratings.

Recommendation 3: Imputing Missing Values: Some of the measures used in the Index are missing values for selected states due to incomplete response rates in the underlying data sources. The 2013 and 2014 releases of the Index address this missing values problem using a method that sets a missing value for a given measure and a given state equal to the unweighted average of that state's remaining measures in the same subdomain. This method is likely to introduce substantial measurement error into the Index, particularly given that most Index measures are not highly correlated at the subdomain level. This method also distorts the weighting system used within the Index by giving certain measures disproportionate influence on subdomain, domain, and overall Index values. A more accurate way of dealing with missing values is to use a statistical imputation method that predicts missing values using available information from a broader range of measures, including Index measures from all states and all available years. To reduce Index distortions due to missing values, we recommend using the technique of multiple chained equation imputation to generate imputed values.⁶ Under this method, a multivariate regression model for panel data will be specified for each measure to predict its missing values, using up to three years of past values on the measure along with other covariates in the model as predictors.

⁵ Graham B1, Regehr G, Wright JG. Delphi as a method to establish consensus for diagnostic criteria. *Journal of Clinical Epidemiology*. 2003 Dec;56(12):1150-6.

⁶ Van Buren S. Multiple imputation of discrete and continuous data by fully conditional specification. *Statistical Methods in Medical Research*. 2007;16(3):219-42.

Other covariates to be used in each model will include non-missing Index measures from the same subdomain and domain, as well as state-level demographic, socioeconomic, and health system characteristics. A Gibbs sampling procedure will be used to determine the order in which variables are imputed, allowing each variable with imputed missing values to be used in the imputation of subsequent variables.

Recommendation 4: Retrospective Longitudinal Comparisons: The 2013 and 2014 releases of the Index do not support longitudinal comparisons of Index values over time (trending) due to significant differences in the measures and methodologies used in 2013 and 2014. The 2014 release cautions users not to compare 2014 results with results found in the previous year's release. Modifications to the Index measures and methodologies are likely to occur with each annual release of the Index due to advances in preparedness science and due to changes in underlying data source availability, content, and quality. Nevertheless, if the Index is to become a valuable decision support tool in policy and practice communities, then users must be able to make valid comparisons of Index values over time and assess the direction and magnitude of change.

To address this unmet need, we recommend including retrospective longitudinal comparisons in each annual release of the Index. Under this recommendation, each annual release of the Index will compute and display Index values not only for the most recent year, but also for each year dating back to the initial release year of 2013. Any modifications to Index measures, scaling, imputation, weighting, and grouping that are introduced with a new Index release will be applied retrospectively back to 2013 in order to support valid longitudinal comparisons. This recommendation will allow each Index release to include valid longitudinal comparisons that assess the direction, magnitude, and statistical significance of annual changes in Index values at the measure, subdomain, domain, and overall level. Moreover, these comparisons will be made at both the state and national levels. The statistical significance of longitudinal comparisons will be assessed using 95% confidence intervals and 95% credibility intervals estimated at the measure, subdomain, domain, and overall Index level.⁷

Recommendation 5: Confidence Intervals for Comparisons Across Domains, Subdomains and States: The 2013 and 2014 releases of the Index caution that the accuracy of comparisons made across domains, subdomains, and individual states has not been established. These previous Index releases suggest a rule of thumb that differences of less than 10% may not be meaningful, but this rule of thumb is not based on any empirical confidence intervals or uncertainty intervals estimated from the Index data. Users wishing to use the Index for decision support and quality improvement will require more robust and reliable information about the uncertainty surrounding Index measures and comparisons. To address this unmet need, we propose to estimate and display traditional 95% confidence intervals and Bayesian 95% credibility intervals for mean Index values at the subdomain, domain, and overall Index levels in order to facilitate accurate comparisons.⁷ Confidence intervals will be estimated by taking into account sampling variability at the measure level for measures constructed from probability sample surveys. Credibility intervals will be estimated using the simulation-based Empirical Bayes method.⁸

⁷ Correct estimation of standard errors for measures included in the Index is a complex task due to the combination of probability sample surveys and full-census surveys that are used as data sources for measures. As a robustness check on the traditional method of estimating standard errors, we will use a simulation-based Empirical Bayes method to test the statistical significance of longitudinal comparisons, with a 95% credibility interval.

⁸ Carlin BP, Gelfand AE. Approaches for Empirical Bayes confidence intervals. *Journal of the American Statistical Association* 1990; 85(409):105-114.

2. Recommendations on Individual Measures

2.1 New Measures to be Added to the Index

Recommendations for new measures were submitted in response to the Open Call for Measures conducted by the National Health Security Preparedness Index program between January and May, 2015. Members of the Index Program Management Office, Model Design Workgroup, and Analytic Methodology Workgroup reviewed the recommendations for their relevance to the Index conceptual framework and for evidence of measure validity, reliability, data availability, and timeliness. Based on these reviews, the following measures were recommended for incorporation into the next release of the Index:

Hospital Partnerships with Community Organizations: Percent of hospitals within the state partnering with 10 or more different types of community organizations, including local health departments, substance abuse and mental health organizations, and faith-based organizations. *Source:* American Hospital Association Annual Survey. *Periodicity:* Annual. *Specification:* Weighted percentage based on hospital bed size. *Proposed Domain:* Community Planning and Engagement. *Proposed Subdomain:* Cross-sector Community Collaboration.

Local Health Department Community Collaboration: Percent of state population served by a local health department that collaborates with community organizations in at least four public health program areas in the last year. *Source:* National Association of County and City Health Officials National Profile of Local Health Departments Survey. *Periodicity:* Every 3 years. *Proposed Domain:* Community Planning and Engagement. *Proposed Subdomain:* Cross-sector Community Collaboration.

Health Care Compliance with Emergency Management Accreditation Standards: Percentage of hospitals, nursing homes, and ambulatory surgery centers (separately measured) within the state that met all Joint Commission accreditation standards for emergency management during the most recent inspection period. *Source:* The Joint Commission. *Periodicity:* annual. *Specification:* Weighted percentage based on size of facility. *Proposed Domain:* Healthcare Delivery. *Proposed Subdomains:* Inpatient Care, Outpatient Care, Long Term Care.

Timeliness of Personnel Activation in Emergency: Average time in minutes required to activate designated state and local personnel in response to a public health emergency. *Source:* Healthy People 2020 Objective PREP-2, Centers for Disease Control and Prevention, Division of State and Local Readiness (CDC/DSLRL). *Periodicity:* annual. *Specification:* Average time in minutes following activation of emergency operations center. *Proposed Domain:* Incident and Information Management. *Proposed Subdomain:* Incident Management.

Timeliness of Public Information Release in Emergency: Average time in minutes required to issue official information to the public about a public health emergency. *Source:* Healthy People 2020 Objective PREP-1, Centers for Disease Control and Prevention, Division of State and Local Readiness (CDC/DSLRL). *Periodicity:* annual. *Specification:* Average time in minutes following activation of emergency operations center. *Proposed Domain:* Incident and Information Management. *Proposed Subdomain:* Incident Management.

Timeliness of State After-Action Reports: Average time in days required by state health agency to complete after-action report and improvement plan following responses to public health emergencies, exercises, and drills. *Source:* Healthy People 2020 Objective PREP-4, Centers for Disease Control and

Prevention, Division of State and Local Readiness (CDC/DSLRL). **Periodicity:** annual. **Specification:** Average time in days following activation of emergency operations center. **Proposed Domain:** Incident and Information Management. **Proposed Subdomain:** Incident Management.

Percent of Workers with Paid Time Off Benefit: Percentage of employed population within a state covered by an employer-provided paid time off benefit during the year. **Source:** U.S. Census Bureau Current Population Survey. **Periodicity:** annual. **Proposed Domain:** Environmental and Occupational Health. **Proposed Subdomain:** Occupational Health.

Percent of Workers Who Telecommute: Percentage of employed population within a state who engage in some work from home during the year. **Source:** U.S. Census Bureau Current Population Survey. **Periodicity:** annual. **Proposed Domain:** Environmental and Occupational Health. **Proposed Subdomain:** Occupational Health.

Fatality Management: State has the following capabilities: (1) an electronic death registration system [EDRS]; and (2) disaster mortuary emergency medical services speciality service capability. Possible third measure: number of funeral service managers, directors, morticians, and undertakers in the state per 100,000 population. **Source:** National Association for Public Health Statistics and Information Systems (NAPHSIS); Federal Interagency Committee on Emergency Medical Services (FICEMS); Bureau of Labor Statistics (BLS). **Periodicity:** annual. **Proposed Domain:** Incident and Information Management. **Proposed Subdomain:** Fatality management.

Infrastructure Resilience: Cutter's Community Resilience Index comprised of more than 50 indicators from 6 domains: outlined in the table below.⁹ **Source:** multiple – see Table 1 below. **Periodicity:** annual. **Proposed Domain:** Pre-event Community Status.

Table 1: Indicators of Infrastructure Resiliency from Cutter's Community Resiliency Index

Resilience concept	Variable description	Justification	Dataset
<i>Social resilience</i>			
Educational attainment equality	Negative absolute difference between % population with college education and % population with less than high school education	Morrow (2008) and Sherrieb et al. (2010)	9
Pre-retirement age	% Population below 65 years of age	Morrow (2008) and Peek (2010)	4
Transportation	% Households with at least one vehicle	Peacock et al. (2010) and Tierney (2009)	9
Communication capacity	% Households with telephone service available	Burger et al. (2013) and Strawderman et al. (2012)	9
English language competency	% Population proficient English speakers	Messias et al. (2012) and Senkbeil et al. (2013)	9
Non-special needs	% Population without sensory, physical, or mental disability	Davis and Phillips (2009) and Matherly and Mobley (2012)	8
Health insurance	% Population under age 65 with health insurance	Chandra et al. (2011) and Plough et al. (2013)	4, 5
Mental health support	Psychosocial support facilities per 10,000 persons	Pietrzak et al. (2012) and Springgate et al. (2011)	4, 30
Food provisioning capacity	Food security rate	Pingali et al. (2005) and Tobin and Whiteford (2012)	28
Physician access	Physicians per 10,000 persons	Chandra et al. (2011) and Norris et al. (2008)	9
<i>Economic resilience</i>			
Homeownership	% Owner-occupied housing units	Haveman and Wolff (2005) and Pendall et al. (2012)	9
Employment rate	% Labor force employed	Rose and Krausmann (2013) and Sherrieb et al. (2010)	9
Race/ethnicity income equality	Negative Gini coefficient	Norris et al. (2008) and Sherrieb et al. (2010)	9
Non-dependence on primary/tourism sectors	% Employees not in farming, fishing, forestry, extractive industry, or tourism	Rose and Krausmann (2013) and Sherrieb et al. (2010)	9
Gender income equality	Negative absolute difference between male and female median income	Enarson (2012) and Sherrieb et al. (2010)	9
Business size	Ratio of large to small businesses	Rose and Krausmann (2013) and Wein and Rose (2011)	3
Large retail-regional/national geographic distribution	Large retail stores per 10,000 persons	Rose and Krausmann (2013) and Wein and Rose (2011)	4, 30
Federal employment	% Labor force employed by federal government	Heinz Center (2002) and Rose and Krausmann (2013)	9, 16

⁹ Cutter SL, Ash KD, Emrich CT. The geographies of community disaster resilience. *Global Environmental Change* 2014; 29:65-77.

Table 1 Continued

Resilience concept	Variable description	Justification	Dataset
<i>Community capital</i>			
Place attachment-not recent immigrants	% Population not foreign-born persons who came to US within previous five years	Norris et al. (2008) and Sherrieb et al. (2010)	9
Place attachment-native born residents	% Population born in state of current residence	Norris et al. (2008) and Sherrieb et al. (2010)	9
Political engagement	% Voting age population participating in presidential election	Peacock et al. (2010) and Sherrieb et al. (2010)	7, 29
Social capital-religious organizations	Persons affiliated with a religious organization per 10,000 persons	Sherrieb et al. (2010) and Walsh (2007)	25
Social capital-civic organizations	Civic organizations per 10,000 persons	Sherrieb et al. (2010) and Walsh (2007)	3, 4
Social capital-disaster volunteerism	Red cross volunteers per 10,000 persons	Paton and Johnston (2006)	4, 29
Citizen disaster preparedness and response skills	Red cross training workshop participants per 10,000 persons	Godschalk (2003)	4, 29
<i>Institutional resilience</i>			
Mitigation spending	Ten year average per capita spending for mitigation projects	Rose (2007) and Godschalk et al. (2009)	4, 10
Flood insurance coverage	% Housing units covered by National Flood Insurance Program	Cheong (2011) and Michel-Kerjan et al. (2012)	4, 13
Jurisdictional coordination	Governments and special districts per 10,000 persons	Murphy (2007) and Ansell et al. (2010)	1, 4
Disaster aid experience	Presidential disaster declarations divided by number of loss-causing hazard events from 2000 to 2009	Cutter et al. (2008a) and Tierney and Bruneau (2007)	11, 24
Local disaster training	% Population in communities with Citizen Corps program	Godschalk (2003) and Simonovich and Sharabi (2013)	4, 12
Performance regimes-state capital	Proximity of county seat to state capital	Bowman and Parsons (2009)	6, 15
Performance regimes-nearest metro area	Proximity of county seat to nearest county seat within a Metropolitan Statistical Area	Bowman and Parsons (2009)	6, 15
Population stability	Population change over previous five year period	USNRC (2012) and Sherrieb et al. (2010)	4, 7
Nuclear plant accident planning	% Population within 10 miles of nuclear power plant	USNRC (2012) and Urbanik II (2000)	4, 22
Crop insurance coverage	Crop insurance policies per square mile	Glauber (2013) and Gladwin and Smith (2013)	6, 27
<i>Housing/infrastructural resilience</i>			
Sturdier housing types	% Housing units not manufactured homes	Sutter and Simmons (2010) and Tierney (2009)	9
Temporary housing availability	% Vacant units that are for rent	Félix et al. (2013) and Johnson (2007)	9
Medical care capacity	Hospital beds per 10,000 persons	Birkmann et al. (2013) and Cimellaro et al. (2010)	2, 4
Evacuation routes	Major road egress points per 10,000 persons	Emmer et al. (2008) and Harrauld (2012)	15
Housing stock construction quality	% Housing units built prior to 1970 or after 2000	Mileti (1999) and Theckethil (2006)	9
Temporary shelter availability	Hotels/motels per 10,000 persons	Johnson (2007) and Tierney (2009)	3, 4
School restoration potential	Public schools per 10,000 persons	Cross (2014) and Ronan and Johnston (2005)	4, 18
Industrial re-supply potential	Rail miles per square mile	Cutter et al. (2008b)	6, 23
High speed internet infrastructure	% Population with access to broadband internet service	UNDESA (2007)	4, 20
<i>Environmental resilience</i>			
Local food suppliers	Farms marketing products through Community Supported Agriculture per 10,000 persons	Berardi et al. (2011)	4, 17
Natural flood buffers	% Land in wetlands	Beatley and Newman (2013) and Brody et al. (2012)	6, 14
Efficient energy use	Megawatt hours per energy consumer	UNDESA (2007)	19
Pervious surfaces	Average percent perviousness	Brody et al. (2012, 2014)	14
Efficient Water Use	Inverted water supply stress index	UNDESA (2007)	21

Source: Cutter SL, Ash KD, Emrich CT. The geographies of community disaster resilience. *Global Environmental Change* 2014; 29:65-77. See this paper for numeric references to datasets.

2.2 Existing Measures to Retain, Exclude, Modify or Reposition Within the Index

Results of validity and reliability tests were combined with findings from the data source assessments in order to develop a detailed recommendation about the status of each of the 197 individual measures included in the 2014 release of the Index. For each of these measures, we recommended one of several possible actions: (a) retain the measure as specified on the 2014 Index; (b) modify the way the measure is specified and calculated in order to improve its validity and/or reliability; (c) reclassify the measure into a different domain and/or subdomain in order to improve the validity and reliability of the underlying domain and/or subdomain composite measure; or (d) exclude the measure from the next edition of the Index. Measures are recommended for exclusion only if they fail multiple tests of measurement value, including: (i) the measure performs poorly on construct validity and reliability tests at both the domain and subdomain level, as indicated by an adjusted multi-trait item-to-scale correlation coefficient of less than 0.3;¹⁰ (ii) the measure's construct validity and reliability does not improve when reclassified into another domain or subdomain scale; (iii) the measure's validity and reliability has not been established through previously published studies; and (iv) the measure is constructed from a data source that has not been updated within a 3 year periodicity cycle (as recommended by the National Quality Forum).¹¹ By design, these criteria for measure selection and retention place priority on measures that help the Index discriminate preparedness levels across different domains and subdomains, across U.S. states, and across years.

Individual recommendations for each measure are shown on the following Measure Details pages for the 2014 release of the Index, as specified in Table 2 below.

¹⁰ We use a relatively weak correlation threshold of 0.3 given the relatively constrained degrees of freedom available for an Index measure in any given year (maximum n=50 states). See for example: Staiger D, Dimick JB, Baser O, Fan Z and Birkmeyer JD. Empirically derived composite measures of surgical performance. *Medical Care* 2009;47: 226-233. Hays RD, Hayashi T. Beyond internal consistency reliability: rationale and user's guide for multitrait analysis program on the microcomputer. *Behavioral Research Methods* 1990;22(2):167-75.

¹¹ This criterion for data source periodicity and timeliness is based on the National Quality Forum's measure selection criteria.

Table 2: Individual Measure Recommendations based on 2014 NHSPI Measure Details

Contents: Measure Details

Measure Recommendations are noted in red call-out boxes at the bottom of each Measure Details page.

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Health Security Surveillance

Health Surveillance & Epidemiological Investigation

State participates in the Behavioral Risk Factor Surveillance System (BRFSS)

ID	M17	Type	Process
Measure last updated	2014 (2013 data)	Obtained for the Index	Jun-14

Rationale for Measure

The measure focuses on participation in the nation's largest surveillance system that tracks health conditions and risk behaviors. The Behavioral Risk Factor Surveillance System (BRFSS) is used to collect prevalence data from U.S. adult residents regarding risk behavior and preventive health practices that can affect health status. Participation can provide population-level data that can be useful in vulnerability assessments and developing messaging and intervention strategies.

Limitations of Measure

The BRFSS has significant challenges related to acquiring data on a local scale. Not all states participate in the BRFSS at the same level.

Use of Measure

The measure is a proxy for the ongoing ability to routinely and timely collect a broad range of health data across the state, and provides relevant information on risk and mental/behavioral health status of the jurisdictional population and the nation as a whole.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Population Health (DPH). National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). Behavioral Risk Factor Surveillance System (BRFSS): States Conducting Surveillance, by Year (2011-2014). 2014 (2013 data). Additional details about this measure are available from the source. The BRFSS is a nationwide behavior surveillance system, and is conducted by telephone (including mobile phones). Data are collected monthly from all 50 states, the District of Columbia, American Samoa, Palau, Puerto Rico, the U.S. Virgin Islands, and Guam. BRFSS has been publishing data since 1984.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to lack of variation across states and poor performance as indicator of capability. Measure reflects a low performance threshold that all states already meet, contributing to poor measure sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

{Number of} epidemiologists {per 100,000 population}

ID	M18	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

The measure focuses on the state-wide personnel capacity of epidemiologists. An accessible epidemiology workforce is critical to assuring an organization can maintain on-going surveillance operations to detect emerging disease and to surge, or ramp up, during and after any significant event involving exposure to a hazard.

Limitations of Measure

This is not a measure of quality as epidemiologists can have varying levels of training and organizations may not always support sufficient continuing education. The measure does not include agency surge plans that can increase the number of epidemiologists available to respond to an event, nor mutual aid plans that can temporarily increase the number of epidemiologists.

Use of Measure

The measure is a proxy for epidemiologic infrastructure within a state and the potential workforce's ability to surge following emergency event.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics (OES)*. 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Retain measure despite low construct validity from internal consistency reliability tests and multi-trait scale analysis. Measure has been validated through prior studies, and periodicity of data collection is adequate.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

State participates in the Epidemic Information Exchange (Epi-X) System

ID	M19	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on participation in the Centers for Disease Control and Prevention (CDC)-sponsored national information sharing system. Participation in this system provides access to national level alerts and raises situational awareness beyond state borders.

Limitations of Measure

Participation in the system is inferred from membership of staff and managers in a state, but it may not represent the actual level of attention the organization gives to alerts from the system.

Use of Measure

The measure is a proxy for routine, effective information-sharing of epidemiologic information by jurisdiction with federal, state, and local networks.

Data Source

Centers for Disease Control and Prevention (CDC). The Epidemic Information Exchange (Epi-X) Program. 2014. Additional details about this measure are available from the source. CDC has collected this measure since December 2000. Epi-X continues to collect data for this specific measure. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to lack of variation across states and poor performance as indicator of capability. Measure reflects a low performance threshold that all states already meet, contributing to poor measure sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

State participates in National Electronic Disease Surveillance System (NEDSS)

ID	M20	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on participation in the national, electronic, Internet-based public health surveillance system. Participation assures that key surveillance data will be comparable across states and enable all states to contribute to a national surveillance perspective.

Limitations of Measure

The measure only considers a state's participation in the National Electronic Disease Surveillance System (NEDSS). The measure does not consider the quality of a state's disease surveillance system.

Use of Measure

The measure is a proxy for effective transmittal and information-sharing of notifiable diseases through electronic reporting systems.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Health Informatics and Surveillance (DHIS). *National Electronic Disease Surveillance System* (NEDSS). 2014. Additional details about this measure are available from the source. The CDC has collected this measure since 2009. All 50 states participate in NEDSS. NEDSS continues to collect data for this specific measure.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to lack of variation across states and poor performance as indicator of capability. Measure reflects a low performance threshold that all states already meet, contributing to poor measure sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

State health department has an electronic syndromic surveillance system that can report and exchange information

ID	M22	Type	Process
Measure last updated	2012	Obtained for the Index	Aug-14

Rationale for Measure

The measure focuses on state health department-based electronic public health syndromic surveillance systems. Syndromic surveillance enables continuous monitoring for indicators of population level changes in health status that can in turn provide early warning of events.

Limitations of Measure

Syndromic surveillance systems are an important tool for the early detection of potential disease outbreaks and other events. They rely on traditional disease surveillance and environmental monitoring systems to confirm events.

Use of Measure

The measure is an indicator for the use of electronic collection and use of syndromic health data and the ability to exchange such information in routine and incident situations.

Data Source

Association of State and Territorial Health Officials (ASTHO). *ASTHO Profile of State Public Health: Volume Three*. 2013. Additional details about this measure are available from the source. ASTHO has collected this measure since 2007. ASTHO continues to collect data for this specific measure every 2–3 years. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure despite low construct validity from internal consistency reliability tests and multi-trait scale analysis. Measure has been validated through prior studies and periodicity of data collection is acceptable.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

Has your {state public health} laboratory implemented the Laboratory Information Management System (LIMS) capability to electronically receive and report laboratory information (e.g., electronic test order and report with hospitals and clinical labs, surveillance data from public health laboratory to epidemiology)?

ID	M217	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Laboratory Information Management Systems (LIMS) are important contributors to timely and accurate sending and receiving of critical laboratory testing information.

Limitations of Measure

Since the introduction of LIMS, newer technologies and standards have been introduced to laboratories, including policies requiring uptake of electronic laboratory reporting (ELR).

Use of Measure

The measure, when combined with other measures that assess informatics and information technology components of laboratory testing and systems, can be used to describe the overall laboratory information sharing and linking capability.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure due to acceptable construct validity from internal consistency reliability tests and multi-trait scale analysis, and acceptable data periodicity.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

Does your state have any legal requirement for nongovernmental (e.g., clinical, hospital-based) laboratories within your state to send clinical isolates or specimens associated with reportable foodborne diseases to the state public health laboratory?

ID	M220	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

States and the federal government have disease reporting rules that require notification of foodborne and other infectious diseases. Reporting requirements provide population-based data on infectious diseases.

Limitations of Measure

The measure does not collect data on what diseases are reportable. States also have requirements to submit the isolates of reportable diseases to public health laboratories.

Use of Measure

The measure reflects a critical aspect of public health infectious disease surveillance and reporting infrastructure. Combined with other measures, it is possible to assess whether a jurisdiction is well positioned to detect foodborne disease outbreaks, trace the source(s) of exposure, and determine the number of cases.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity from multi-trait scale analysis and internal consistency reliability tests, and no evidence of validity and reliability from prior studies.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

{In which} of the following federal surveillance programs does your {state public health} laboratory participate? [Foodborne Diseases Active Surveillance Network (FoodNet), Influenza Centers for Disease Control and Prevention (CDC)/World Health Organization (WHO) Surveillance Network]

ID	M256	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on participation in national information sharing systems and electronic web-based public health surveillance systems. Participation assures that key laboratory and surveillance data will be comparable across states and enables all states to contribute to a national surveillance perspective.

Limitations of Measure

Participation is a “yes” or “no” determination, though from state to state the scope and quality of participation can vary significantly.

Use of Measure

The measure is a proxy for effective transmittal and information sharing of notifiable diseases through electronic reporting systems.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of programs out of two

Recommendation: Modify measure because current specification as a count variable produces inconsistencies in scaling and low construct validity from multi-trait scale analysis and internal consistency reliability tests. Separate measure into two dichotomous measures to improve construct validity.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

{Proportion of} foodborne illness outbreaks reported to Centers for Disease Control and Prevention (CDC) for which an etiologic agent is confirmed

ID	M23	Type	Process
Measure last updated	2012	Obtained for the Index	Jun-14

Rationale for Measure

The measure focuses on a state's ability to confirm the etiologic agent causing a foodborne disease outbreak. States actively investigating and resolving food and water outbreaks are able to identify and intervene more quickly to prevent a further spread of outbreaks in the community.

Limitations of Measure

Certain states identify and report foodborne illness outbreaks more frequently than other states. This may increase the denominator and lower the state's percentage, creating a misleading view of the state's foodborne disease investigation program.

Use of Measure

The measure is a proxy for the ability to detect and investigate outbreaks, confirm an etiologic agent, and report outbreaks to the national level.

Data Source

Centers for Disease Control and Prevention (CDC). *Foodborne Online Outbreak Database (FOOD)*. 2012. Additional details about this measure are available from the source. The CDC has collected this measure since 1994. CDC continues to collect data for this specific measure. Data are available online from National Outbreak Reporting System (NORS) FOOD.

Target Setting

Statistically calculated

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have been established through prior studies.

Data Type Quantitative

Data Integration Proportion (0–1) of cases confirmed

Data Normalization State score divided by target

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

State health department participates in a broad prevention collaborative addressing HAIs (healthcare-associated infections)

ID	M289	Type	Process
Measure last updated	2014 (2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

Healthcare-associated infections (HAIs) are infections patients get while receiving medical treatment in a healthcare facility. HAIs are a threat to patient safety. State prevention collaboratives consist of multiple hospitals within a state which target an infection as a team, implement prevention strategies through culture change, share experiences between facilities, measure progress as a group, and provide feedback to clinicians and staff. State health department participation in these collaborative is an indicator that the state health department is working collaboratively and is actively engaged in this prevention activity.

Limitations of Measure

The measure indicates that the state health department is a participant in the prevention collaborative, but the measure does not describe the state's rates of various types of healthcare-associated infections or if the rates are in decline as a result of the prevention collaborative. The measure does not indicate the percentage of state hospitals participating in the prevention collaborative.

Use of Measure

The measure is a good indication of a state health department's involvement in disease surveillance, prevention, and control of healthcare-associated infections in the country.

Data Source

Centers for Disease Control and Prevention (CDC). National Healthcare Safety Network (NHSN). *Prevention Status Reports 2013. Healthcare-Associated Infections*. 2014 (2013 data). Additional details about this measure are available from the source. Data are collected through NHSN. All 50 states participate in NHSN.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to lack of variation across states and poor performance as indicator of capability. Measure reflects a low performance threshold that all states already meet, contributing to poor measure sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Health Security Surveillance

Health Surveillance & Epidemiological Investigation

State has a public health veterinarian

ID	M290	Type	Structure
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Because animals are impacted by the same disasters and emergencies as humans—natural and manmade, large and small—a measure of preparedness is that a state has a public health veterinarian who could provide expert advice on animal-related matters as well as help provide coordination of animal-related planning, response, and recovery activities.

Limitations of Measure

A “yes” response indicates that this expert resource is present at the state level, but only implies that the state public health veterinarian is integrated into an animal response plan or is working in coordination with other animal-related resources such as a board of animal health or the state animal response team. The data source provides a list of contact information for each state’s public health veterinarian, but no job description details or related material. Also, this source list is maintained for helping direct and develop uniform public health procedures involving zoonotic disease in the U.S. and its territories, so planning for animals in an emergency in the context of the Health Security Surveillance domain may only be a secondary consideration.

Use of Measure

The expertise of a state public health veterinarian would be an asset for preparedness planning and response in order to address and minimize the effects to animals in affected communities during and following an emergency.

Data Source

National Association of State Public Health Veterinarians (NASPHV). *Designated and Acting State Public Health Veterinarians, 2014*. 2014. Additional details about this measure are available from the source. NASPHV annually updates a roster of designated and acting state public health veterinarians.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity from multi-trait scale analysis and internal consistency reliability tests, and no evidence of validity and reliability from prior studies.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

NOTE: Subdomain contains a large number of measures with low construct validity and reliability. Exclusions will enhance the construct validity of the subdomain.

Ability of Public Health Emergency Preparedness (PHEP) Cooperative Agreement-funded Laboratory Response Network chemical (LRN-C) laboratories to collect, package, and ship samples properly during an LRN-C exercise

ID	MI	Type	Outcome
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on laboratory knowledge, skills, and abilities to follow federal packaging and shipping regulations and the Centers for Disease Control and Prevention's (CDC) Laboratory Response Network (LRN) protocols.

Limitations of Measure

In the exercise, all of the samples are simulated and real-life confounding issues like mislabeled specimens or specimens arriving at the laboratory at different times are not included. The current exercise is at best a demonstration of capability although it may not mimic real-life conditions.

Use of Measure

The measure is a proxy for the ability to package and ship specimens during a public health chemical emergency.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's Public Health Emergency Preparedness Program (PHEP) from public health laboratories administered through the CDC Laboratory Response Network (LRN) Program.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to lack of variation across states and poor performance as indicator of capability. Measure reflects a low performance threshold that all states already meet, contributing to poor measure sensitivity and specificity. Validity and reliability of measure has not been established through prior studies. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Has your chemical terrorism/threat (CT) laboratory been certified or accredited by any of the following? [Clinical Laboratory Improvement Amendments (CLIA), College of American Pathologists (CAP), or International Organization for Standardization (ISO)]

ID	M13	Type	Outcome
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Aug-14

Rationale for Measure

A laboratory must have federal certification to conduct testing for chemical agents. The measure focuses on certification or accreditation of a chemical laboratory.

Limitations of Measure

Certification can be difficult because there are only simulated samples.

Use of Measure

The measure is a proxy for implementation of standards for quality in chemical agent testing.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012-2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity from multi-trait scale analysis and internal consistency reliability tests, and no evidence of validity and reliability from prior studies. Measure combines multiple certification programs having different standards and requirements, which limits sensitivity and specificity. Because CLIA certification is required for all laboratories conducting human testing, any observed variation in this measure is unlikely to be valid.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Has your radiological terrorism/threat (RT) laboratory been certified or accredited by any of the following? [U.S. Environmental Protection Agency (EPA), Clinical Laboratory Improvement Amendments (CLIA), College of American Pathologists (CAP), or International Organization for Standardization (ISO)]

ID	M14	Type	Process
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Aug-14

Rationale for Measure

A relevant certification framework exists for radiological terrorism laboratory certification. The measure indicates whether a state's radiological terrorism laboratory has earned such certification.

Limitations of Measure

Accreditation helps ensure the laboratory has the capability and resources to meet the requirements of the certification framework.

Use of Measure

The measure is a proxy for implementation of standards for quality in radiological agent testing.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012-2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity from multi-trait scale analysis and internal consistency reliability tests, and no evidence of validity and reliability from prior studies. Measure combines multiple certification programs having different standards and requirements, which limits sensitivity and specificity. Because CLIA certification is required for all laboratories conducting human testing, the validity of any observed variation in this measure is questionable.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

{State has a} U.S. Department of Agriculture (USDA) National Animal Health Laboratory Network (NAHLN) laboratory

ID	M15	Type	Structure
Measure last updated	2013	Obtained for the Index	Jun-14

Rationale for Measure

The measure focuses on testing for zoonotic pathogens endemic to or emerging in animal populations. Participation in this network increases the likelihood of standard methods, systems, and data validation.

Limitations of Measure

The state may not have a NAHLN laboratory within their jurisdiction, but may have access to one in an adjacent state. Not all laboratories will have the same capabilities.

Use of Measure

The measure is an indicator of the ability to rapidly perform surveillance and diagnostic testing in animals in order to detect zoonotic diseases of public health significance.

Data Source

United States Department of Agriculture (USDA). Animal and Plant Health Inspection Service (APHIS). *All National Animal Health Laboratory Network (NAHLN) Lab List*. 2013. Additional details about this measure are available from the source. USDA updates lists of laboratories as changes occur.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity from multi-trait scale analysis and internal consistency reliability tests, and no evidence of validity and reliability from prior studies. USDA laboratories provide testing services for multiple states, thereby limiting the performance of this measure as an indicator of state capability.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your {state public health} laboratory have a written plan for coordination and communication with any other agency in your jurisdiction in the event of a foodborne disease emergency?

ID	M203	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

State public health laboratories play a critical role in the detection of foodborne outbreaks by identifying and subtyping dangerous pathogens as well as by linking clinical specimen data to public health surveillance systems and epidemiological findings. The measure captures a key planning component for these laboratories; namely, that they have established plans and procedures to coordinate and communicate with key agencies and partners should a significant foodborne outbreak occur.

Limitations of Measure

The measure does not assess the quality or comprehensiveness of written plans, nor whether they have been exercised, evaluated, or updated within a given timeframe.

Use of Measure

The measure, when combined with other measures that assess state public health laboratory planning, can contribute to an overall picture of public health system preparedness for public health emergencies.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity from multi-trait scale analysis and internal consistency reliability tests, and no evidence of validity and reliability from prior studies. Measure reflects a low performance threshold that states can interpret and comply with in many different ways, resulting in limited sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your state public health laboratory have a USDA/APHIS (U.S. Department of Agriculture/Animal and Plant Health Inspection Service) permit for the importation and transportation of controlled materials, organisms, and vectors?

ID	M208	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The laboratory must have a federal U.S. Department of Agriculture/Animal and Plant Inspection Service (USDA/APHIS) permit for the importation and transportation of controlled materials. The measure focuses on possession of the permit.

Limitations of Measure

The measure looks at a point in time. The permit must be renewed every year. Specific language is required on the permit; laboratories may not have entered all of the right information.

Use of Measure

Laboratories must have a permit to receive samples for testing. The measure indicates whether the laboratory has the permit necessary for the capability to test a specified list of samples.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have been established through prior studies.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your state public health laboratory have enough staffing capacity to work five 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A (H1N1)?

ID	M8	Type	Process
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Aug-14

Rationale for Measure

The measure focuses on the state public health laboratory workforce readiness and surge capacity.

Limitations of Measure

The measure specifically concerns how a laboratory must surge, or ramp up, their workforce in order to meet the testing demand of an infectious disease outbreak. Laboratories may have different ways of managing surge capacity.

Use of Measure

The measure is a public health laboratory staffing indicator for a large-scale infectious disease event.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012-2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity from multi-trait scale analysis and internal consistency reliability tests, and no evidence of validity and reliability from prior studies. States can interpret and comply with this measure in many different ways, resulting in limited sensitivity and specificity.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your {state public health} laboratory have a documented continuity of operations plan (COOP) consistent with National Incident Management System (NIMS) guidelines?

ID	M9	Type	Process
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Aug-14

Rationale for Measure

The measure focuses on laboratory preparedness to sustain operations and provide alternative methods for operations during a public health emergency that directly impacts the laboratory staff or facility.

Limitations of Measure

The measure does not determine if the COOP is laboratory-specific or part of an agency plan. The measure does not evaluate the quality or comprehensiveness of the COOP.

Use of Measure

The measure is an indicator for the ability to continue laboratory operations during a public health emergency that directly impacts laboratory staff or the facility.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012-2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have been established through prior studies.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your {state public health} laboratory have a plan in place to receive samples from a sentinel clinical laboratory during nonbusiness hours?

ID	MII	Type	Process
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Aug-14

Rationale for Measure

The measure focuses on a public health laboratory's ability to receive samples at all times of the day from healthcare laboratories. It demonstrates that the public health laboratory is capable of receiving critical specimens during nonbusiness hours.

Limitations of Measure

The measure may reflect that a laboratory has a plan in place, but does not reflect the frequency with which this plan may be used or tested. The ability to receive samples is only one step among many that result in rapid, accurate testing, which helps inform policy decisions in a response.

Use of Measure

This measure focuses on laboratory ability to receive samples at all times of the day.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012-2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability of a closely related measure have been established through prior studies.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your state public health laboratory currently have the capacity in place to assure the timely transportation (pick-up and delivery) of samples 24/7/365 days to the appropriate public health Laboratory Response Network (LRN) reference laboratory?

ID	M12	Type	Process
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Aug-14

Rationale for Measure

Rapid transport of specimens and isolates to a public health laboratory is important to decrease the time to recognize and identify a potential public health emergency. The measure focuses on a laboratory's ability to assure transport of samples at all times of the day.

Limitations of Measure

The measure does not evaluate the time between pick-up and delivery. The measure does not look at the percentage of sentinel labs (i.e., hospital-based labs that have direct contact with patients) that are covered by the transport system.

Use of Measure

The measure is an indicator for the ability to assure rapid transport of critical samples to the public health laboratory 24/7/365.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012-2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability of a closely related measure have been established through prior studies.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your {state public health} laboratory provide or assure the following laboratory tests? [arbovirus serology, hepatitis C serology, Legionella serology, measles serology, mumps serology, Neisseria meningitidis serotyping, Plasmodium identification, Salmonella serotyping, Shigella serotyping, Varicella serology]

ID	M211	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the public health laboratory's (PHL's) ability to provide a range of diagnostic and surveillance testing.

Limitations of Measure

Laboratories will use a variety of methods to provide this testing, and it is not standard across all PHLs. Laboratories may have a difficult time answering the question, depending on how it is asked.

Use of Measure

This and other measures provide an indication of the overall laboratory capability to test for a broad range of infectious agents.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of tests out of ten

Recommendation: Modify measure to address low construct validity from multi-trait scale analysis and internal consistency reliability tests. Specification as a count variable results in inconsistencies in scaling and low specificity. Replace with dichotomous measures for a subset of the individual tests to serve as sentinel indicators of testing capability.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your {state public health} laboratory provide or assure the following laboratory tests? [antimicrobial susceptibility testing confirmation for vancomycin resistant *Staphylococcus aureus*, Anaplasmosis (*Anaplasma phagocytophilum*), Babesiosis (*Babesia sp.*), botulinum toxin—mouse toxicity assay, Dengue Fever, Hantavirus serology, identification of unusual bacterial isolates, identification of fungal isolates, identification of parasites, *Klebsiella pneumoniae* Carbapenemase (*blaKPC*) by PCR, *Legionella* by culture or PCR, malaria by PCR, norovirus by PCR, Powassan virus, rabies]

ID	M216	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the public health laboratory's (PHL's) ability to provide a range of diagnostic and surveillance testing.

Limitations of Measure

Laboratories will use a variety of methods to provide this testing; it is not standard across all PHLs. Laboratories may have a difficult time answering the question, depending on how it is asked.

Use of Measure

This and other measures provide an indication of overall laboratory capability to test for a broad range of infectious agents.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Quantitative
Data Integration	Predefined choice
Data Normalization	Number of tests out of 15

Recommendation: Modify measure to address low construct validity from multi-trait scale analysis and internal consistency reliability tests. Specification as a count variable results in inconsistencies in scaling and low specificity. Replace with dichotomous measures for a subset of the individual tests to serve as sentinel indicators of testing capability.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Does your state license, certify, and/or accredit clinical laboratories under federal Centers for Medicare & Medicaid Services (CMS) regulations?

ID	M219	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Licensing, certification, and accreditation demonstrate that laboratories meet certain industry and regulatory standards, desired or required, to conduct laboratory tests on specimens and samples safely and effectively.

Limitations of Measure

States have different regulations and requirements for licensing.

Use of Measure

This and related laboratory performance measures reflect the ability of state public health laboratories to meet critical regulatory and industry standards for safe and effective laboratory testing.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Capability construct being measured is ambiguous because CLIA designates CMS with the responsibility to certify all laboratories that perform human testing.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Which of the following {organizations} provide certification or accreditation of your state public health laboratory? [American Association for Laboratory Accreditation (A2LA), Clinical Laboratory Improvement Amendments (CLIA), College of American Pathologists (CAP)]

ID	M259	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

State public health laboratories are required to meet certain industry standards to ensure safe and accurate testing of clinical specimens. Certification or accreditation provides assurance that a laboratory is meeting these standards to conducting laboratory tests properly.

Limitations of Measure

The measure has no apparent limitations.

Use of Measure

The measure is a proxy for implementation of standards for quality in clinical laboratory testing. This and related measures can indicate whether a laboratory is meeting agreed upon third party standards.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of organizations out of three

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Specification of measure as a count variable results in scale inconsistencies that limit the sensitivity and specificity of the measure. CLIA certification is universal due to federal law, and the marginal benefit of other certifications has not been established in prior studies.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Proportion of Laboratory Response Network biological (LRN-B) laboratory proficiency tests successfully passed by Public Health Emergency Preparedness (PHEP) Cooperative Agreement-funded laboratories

ID	M2	Type	Outcome
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Recognition of a health emergency requires accurate and timely laboratory testing of a variety of samples in order to detect potential diseases or exposures. The measure focuses on the ability of lab to detect and identify biological threat agents in an exercise or test scenario.

Limitations of Measure

Proficiency tests are at best a test of a laboratory's capability. Proficiency tests are administered only a few times annually. Laboratories will lack proficiency tests for several years for many of the assays they are capable of performing.

Use of Measure

The measure is an indicator of the ability to conduct quality testing and analysis to detect biological disease agents.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's Public Health Emergency Preparedness Program (PHEP) from public health laboratories administered through the CDC Laboratory Response Network (LRN) Program.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Proportion (0–1) of tests passed
Data Normalization	State score divided by target

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have been established through prior studies. Adapt specification of this measure to be consistent with Healthy People 2020 Objectives (PREP 3.1 and PREP 3.2).

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Percentage of pulsed field gel electrophoresis (PFGE) subtyping data results for *E. coli* O157:H7 submitted to the PulseNet (PN) national database within four working days of receiving isolate at the PFGE laboratory

ID	M3	Type	Outcome
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Bacterial subtyping data can be important in outbreak detection. The measure focuses on the timeliness of the public health laboratory to perform subtyping tests and report results nationally.

Limitations of Measure

The measure is limited to time to perform PFGE and upload data. The measure does not look at transport time or identification time. The measure is limited to foodborne agents that have PFGE subtyping.

Use of Measure

The measure is a proxy for the ability to analyze samples and upload laboratory results to a national network in a timely manner during a public health food emergency.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's Public Health Emergency Preparedness Program (PHEP) from public health laboratories administered through the CDC Laboratory Response Network (LRN) Program.

Target Setting

Statistically calculated

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have been established through prior studies.

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Proportion of agents correctly identified and quantified from unknown samples during unannounced proficiency testing {during the Laboratory Response Network (LRN) Emergency Response Pop Proficiency Test (PopPT) Exercise}

ID	M5	Type	Process
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on a public health laboratory's ability to perform, without notice, tests on patient specimens for chemical agents and report the results.

Limitations of Measure

A proficiency test is at best a demonstration of capability. The current proficiency testing does not measure the public health laboratory's ability to process a large number of samples.

Use of Measure

The measure is a proxy for the ability to analyze and upload laboratory results to a national network in a timely manner during a public health food emergency.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's Public Health Emergency Preparedness Program (PHEP) from public health laboratories administered through the CDC Laboratory Response Network (LRN) Program.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests.

Data Type Qualitative

Data Integration Predefined choice

Data Normalization Number of agents detected out of two

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Number of reference laboratories, other laboratories, or national laboratories in Laboratory Response Network (LRN) that could test for biological agents

ID	M6	Type	Structure
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on total Laboratory Response Network (LRN)-member laboratories capable of testing for biological agents in a state.

Limitations of Measure

The measure is a fairly static number and only measures the number of laboratories, not the capacity of testing within those laboratories, and only counts laboratories within the LRN. Further, many large commercial laboratories have the ability to test for biological agents.

Use of Measure

The measure provides the overall number of LRN laboratories able to test and respond during a public health biological emergency.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's Public Health Emergency Preparedness Program (PHEP) from public health laboratories administered through the CDC Laboratory Response Network (LRN) Program.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number of labs
Data Normalization	State score divided by target

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited due to exclusion of non-LRN laboratories.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Number of additional chemical agent detection methods demonstrated by Laboratory Response Network chemical (LRN-C) Level 1/Level 2 laboratories

ID	M7	Type	Outcome
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Recognition of a health emergency requires accurate and timely laboratory testing of a variety of samples in order to detect potential diseases or exposures. The measure focuses on the ability of a laboratory to detect and identify chemical threat agents during an exercise or test.

Limitations of Measure

The measure is only looking at additional methods and not all methods the laboratory is capable of testing. Proficiency testing is the best demonstration of capability.

Use of Measure

This is one measure for completeness or scope of chemical laboratory testing capability available in a state.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's Public Health Emergency Preparedness Program (PHEP) from public health laboratories administered through the CDC Laboratory Response Network (LRN) Program.

Target Setting

Statistically calculated

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests.

Data Type Quantitative

Data Integration Number of methods

Data Normalization State score divided by target

Health Security Surveillance

Biological Monitoring & Laboratory Testing

{Number of} medical and clinical laboratory technicians {per 100,000 population}

ID	M16	Type	Structure
Measure last updated	2013	Obtained for the Index	Jun-14

Rationale for Measure

The measure focuses on a state's personnel capacity of medical and clinical laboratory technicians.

Limitations of Measure

This is a broad measure of a state's laboratory workforce capacity and does not indicate the state's laboratory workforce quality. Some states mandate licensure or certification of laboratory technicians and require continuing education to maintain certification.

Use of Measure

The measure is a proxy for the laboratory testing infrastructure in a state and for the workforce's ability to surge, or ramp up, following an emergency event (e.g., more personnel indicate greater potential reserve from which to surge).

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited because measure is not restricted to public health laboratories

Health Security Surveillance

Biological Monitoring & Laboratory Testing

{Total number of} chemical threat and multi-hazards preparedness exercises {or drills} your state public health laboratory conducted or participated in {annually}

ID	M286	Type	Process
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

Drills and exercises are important to the development and improvement of emergency preparedness and response plans and procedures. Frequent testing of plans and updated plans are important to continuous quality improvement.

Limitations of Measure

The measure includes all tabletop exercises, drills, functional exercises, and full-scale exercises for both chemical threats and multi-hazards (e.g., any combo of biological, chemical, and radiological threats) participated in from July 1, 2012 to June 30, 2013.

Use of Measure

The measure is an indicator that the state's public health laboratory's emergency response plans have been tested recently.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012–2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number of exercises
Data Normalization	State score divided by target

Recommendation: Modify measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited by scaling as a count variable. Validity and reliability can be improved by rescaling as a dichotomous measure indicating whether the recommended number of exercises/drills were conducted in the previous year.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Percentage of pulsed field gel electrophoresis (PFGE) sub-typing data results for *Listeria monocytogenes* submitted to the PulseNet (PN) national database within four working days of receiving isolate at the PFGE laboratory

ID	M287	Type	Process
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Rapid identification of *Listeria monocytogenes* at the state's PFGE laboratory and rapid submission of the results to the PulseNet national database is important to be able to identify multistate or national outbreaks of diseases. Once outbreaks are identified and the source is investigated, recalls and advisories can be issued to protect the public from additional exposure.

Limitations of Measure

The measure only evaluates the timeliness of identification and reporting of *Listeria monocytogenes*. The measure does not indicate how many samples are being processed per year, nor does it evaluate the quality of the PFGE results being submitted.

Use of Measure

The measure can be used as a capacity indicator of the state's PFGE laboratories timeliness in reporting results to the national PulseNet database.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's PulseNet.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have been established through prior studies.

Health Security Surveillance

Biological Monitoring & Laboratory Testing

Number of core methods (agents) demonstrated by Laboratory Response Network chemical (LRN-C) Level 1/Level 2 laboratories

ID	M288	Type	Outcome
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The Centers for Disease Control and Prevention (CDC) identified nine core methods for detecting and measuring chemical agents, and conducted testing to determine LRN-C laboratories' proficiency in these methods. The core methods are significant as they use technical fundamentals that provide the foundation of chemical analysis capabilities.

Limitations of Measure

The measure focuses on standard laboratory procedures and fundamental tasks that are critical to the accurate identification of chemical agents. Standards set under the Clinical Laboratory Improvement Amendments (CLIA) and the College of American Pathologists (CAP) accreditation program are critical components, as is success in achieving proficiency annually in the methods necessary to meet these capabilities.

Use of Measure

The measure reflects annual proficiency testing required to remain certified to test for chemical agents.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC's Public Health Emergency Preparedness Program (PHEP) from public health laboratories administered through the CDC LRN program.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests.

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of methods out of nine

Community Planning & Engagement

Cross-Sector/Community Collaboration

Is your state education agency a member of the state emergency planning committee?

ID	M47	Type	Process
Measure last updated	2012	Obtained for the Index	Feb-13

Rationale for Measure

The measure focuses on participation of the state education agency, representing the interests of schools at state-level emergency committees impacting all school-aged children populations.

Limitations of Measure

Being a member of a state emergency planning committee may or may not reflect the level of participation of schools across a given state in emergency preparedness planning.

Use of Measure

The measure is a proxy for a basic or initial degree of involvement that a state education agency has in higher-level state emergency planning.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Adolescent and School Health (DASH). *School Health Policies and Programs Study* (SHPPS). 2012. Additional details about this measure are available from the source. State-level data obtained through CDC DASH from the *Healthy and Safe School Environment State Questionnaire*. SHPPS was conducted in 1994, 2000, and 2006, and 2012. SHPPS was not updated in 2014.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability of related measure have been established through prior studies.

Community Planning & Engagement

Cross-Sector/Community Collaboration

{Does your state have} Public Health Accreditation Board (PHAB) accredited health departments?

ID	M87	Type	Process
Measure last updated	2014	Obtained for the Index	Oct-14

Rationale for Measure

The measure focuses on local health department accreditation to national standards that promote continuous quality improvement and a mechanism for recognizing high-performing public health departments.

Limitations of Measure

Accreditation is still in the early stages and the preparedness component is still being refined. Health departments “in process” are not considered as accredited in this measure.

Use of Measure

The measure is a proxy for the ability to meet national standards for public health department quality improvement and emergency preparedness.

Data Source

Public Health Accreditation Board (PHAB). *Health Departments in e-PHAB*. 2013. Additional details about this measure are available from the source. Published list on PHAB website. Accreditation lasts for five years. A seven-step process for accreditation is required, including a site visit conducted by three or four PHAB trained site visitors. Accreditation requires public health departments to submit documentation for five years.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited because all qualified agencies have not yet had the opportunity to secure PHAB accreditation status.

Community Planning & Engagement

Cross-Sector/Community Collaboration

During the past two years, did your state develop, revise, or assist in developing model policies, policy guidance, or other materials to inform district or school policy on each of the following topics? [crisis preparedness, response, and recovery]

ID	M90	Type	Process
Measure last updated	2012	Obtained for the Index	Feb-13

Rationale for Measure

The measure focuses on development of school policy documents focusing on crisis preparedness, response, and recovery topics.

Limitations of Measure

The measure does not indicate if the model policies, policy guidance, or other materials were adopted or implemented by state schools.

Use of Measure

The measure is a proxy for state policy set in-place for school crisis preparedness, response, and recovery guidance.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Adolescent and School Health (DASH). *School Health Policies and Programs Study* (SHPPS). 2012. Additional details about this measure are available from the source. State-level data were obtained through CDC DASH from the *Healthy and Safe School Environment State Questionnaire*. SHPPS was conducted in 1994, 2000, and 2006, and 2012. SHPPS was not updated in 2014.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Community Planning & Engagement

Cross-Sector/Community Collaboration

During the past two years, did your state distribute or provide to district or school staff model policies, policy guidance, or other materials to inform district or school policy on each of the following topics? [crisis preparedness, response, and recovery]

ID	M91	Type	Process
Measure last updated	2012	Obtained for the Index	Feb-13

Rationale for Measure

The measure demonstrates the provision of basic preparedness guidance and policy material across all state schools to ensure preparedness, response, and recovery for emergencies.

Limitations of Measure

The measure does not indicate if the materials distributed were used by the schools and school districts to develop and implement plans for emergency preparedness, response, and recovery.

Use of Measure

The measure is an indicator of distribution of standard guidance and policies to all state schools for emergency preparedness, response, and recovery.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Adolescent and School Health (DASH). *School Health Policies and Programs Study* (SHPPS). 2012. Additional details about this measure are available from the source. State-level data were obtained through CDC DASH from the *Healthy and Safe School Environment State Questionnaire*. SHPPS was conducted in 1994, 2000, and 2006, and 2012. SHPPS was not updated in 2014.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited because of ambiguity in the types of materials distributed. This measure is substantially subsumed within and redundant with the previous measure M90.

Community Planning & Engagement

Cross-Sector/Community Collaboration

Does your {state public health} laboratory employ an individual whose sole responsibility is to promote partnerships between public laboratories and private laboratories within your state?

ID	M171	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure reflects the importance of partnerships between public and private laboratories to facilitate information flow and testing protocols during and following an outbreak.

Limitations of Measure

The measure may or may not be feasible or established in states that have low rates of outbreaks or smaller populations, making it less useful in interpreting a state's readiness or capacity to respond.

Use of Measure

The concept that this measure illustrates is the need for ongoing relationship cultivation between public and private laboratories, as well as a state's decision to prioritize this activity as an employee's function. The assumption is that the measure translates into the likelihood that shared information and protocols will be facilitated during emergencies if someone is assigned full-time to promoting laboratory partnerships.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited because the level of staffing required to have this capability is likely to scale with the size of the state and number and types of clinical laboratories.

Community Planning & Engagement

Children & Other At-Risk Populations

State has {number of} disaster management plan{s} addressing {the following} vulnerable populations: adults with generalized special healthcare needs, children with generalized special healthcare needs, patients requiring dialysis, patients who are oxygen dependent, and/or patients requiring home ventilators

ID	M40	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Oct-13

Rationale for Measure

The measure focuses on state disaster plans addressing at-risk and special needs populations, including adults with generalized special healthcare needs, children with generalized special healthcare needs, and patients requiring dialysis, are oxygen dependent, and/or require home ventilators.

Limitations of Measure

While the measure captures whether a state has a specific plan focused on children and other at-risk populations/special needs populations, it may or may not capture a state's ability to effectively anticipate planning for functional needs (e.g., access to countermeasures). The existence of a plan may or may not reflect whether it has been recently used and or tested. Finally, some states may actually outline responsibilities relative to children and other at-risk populations in their broader plans, instead of having a specific plan to address them.

Use of Measure

The measure is a proxy for the ability to anticipate the disaster management response for adults and children who are at-risk, including special needs populations.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011. Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of plans out of five

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited due to specification as a count variable, causing inconsistencies in scaling. Data source has not been updated within a 3 year periodicity cycle.

Community Planning & Engagement

Children & Other At-Risk Populations

Has your state used any materials from the U.S. Department of Education, such as *Practical Information on Crisis Planning: A Guide for Schools and Communities*, to develop policies related to crisis preparedness, response, and recovery?

ID	M46	Type	Process
Measure last updated	2012	Obtained for the Index	Feb-13

Rationale for Measure

The measure focuses on standard practices for implementing crisis preparedness, response, and recovery for schools and impacts all school-aged children populations.

Limitations of Measure

The measure is limited in that “use” of materials can be broadly interpreted, negatively impacting this measure’s potential reliability.

Use of Measure

The measure is a proxy for the application of a state’s practices and policies concerning crisis preparedness, response, and recovery in schools.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Adolescent and School Health (DASH). *School Health Policies and Programs Study* (SHPPS). 2012. Additional details about this measure are available from the source. State-level data were obtained through CDC DASH from the *Healthy and Safe School Environment State Questionnaire*. SHPPS was conducted in 1994, 2000, and 2006, and 2012. SHPPS was not updated in 2014.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited due ambiguities in question wording regarding "any materials." Data source has not been updated within a 3 year periodicity cycle.

Community Planning & Engagement

Children & Other At-Risk Populations

Currently, does someone in your state oversee or coordinate the state's school health and safety policies and activities; for example, a state school health coordinator?

ID	M49	Type	Process
Measure last updated	2012	Obtained for the Index	Feb-13

Rationale for Measure

The measure focuses on state coordination of school safety policies and activities impacting all school-aged children populations.

Limitations of Measure

A limitation of the measure is that having someone assigned to this position at the state level may or may not reflect improved or high-level protection or planning consideration of school-aged children populations in a given state.

Use of Measure

The measure is a proxy for an initial degree of planning for emergencies by managing a state's school safety policies and activities.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Adolescent and School Health (DASH). *School Health Policies and Programs Study* (SHPPS). 2012. Additional details about this measure are available from the source. State-level data were obtained through CDC DASH from the *Healthy and Safe School Environment State Questionnaire*. SHPPS was conducted in 1994, 2000, and 2006, and 2012. SHPPS was not updated in 2014.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability have not been established in prior studies, and sensitivity and specificity of the measure is limited due the likelihood that this capability exists to some extent in every state, depending on interpretation. Data source has not been updated within a 3 year periodicity cycle.

Community Planning & Engagement

Children & Other At-Risk Populations

{State requires all child care providers to have} a plan for children with disabilities and those with access and functional needs

ID	M52	Type	Process
Measure last updated	2014	Obtained for the Index	Aug-14

Rationale for Measure

The state must require that all child care providers have a written plan that accounts for children with disabilities and those with access and functional needs. This standard must go beyond specific classes of special needs that may exist elsewhere in state code. It must include a specific requirement indicating how all children with special needs will be included in the emergency plan. The requirement must apply to all regulated child care providers

Limitations of Measure

The measure does not include nonlicensed providers. The measure does not reflect whether the plan has been tested or reviewed in the past two years or whether there are effective partnerships underpinning the plan.

Use of Measure

The measure is a proxy for the ability to take care of children with disabilities or access and functional needs in child care facilities during a public health emergency.

Data Source

Save the Children. *2014 U.S. Report Card on Children in Disasters*. 2014. Additional details about this measure are available from the source. Save the Children annually has conducted research on regulations and child care licensing laws for all 50 states and the District of Columbia since 2008.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests.

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Community Planning & Engagement

Children & Other At-Risk Populations

{State has} a multi-hazard plan for all K-12 schools

ID	M53	Type	Process
Measure last updated	2014	Obtained for the Index	Aug-14

Rationale for Measure

The measure focuses on the state requirement that all schools (public and private schools) have a disaster plan that addresses multiple types of hazards and covers a number of responses, including evacuation, shelter-in-place, and lock-down situations.

Limitations of Measure

The measure does not reflect how comprehensively the plan may engage partners or truly indicate a state's ability to manage multiple hazards in a school environment for a more robust response. Also, possession of a state plan does not ensure that it has been used or tested within the past two years. There is a lack of definition around what entails "multiple types of hazards" and which may or may not be appropriate for a state to plan for (accounting for regional differences).

Use of Measure

The measure is a proxy for ability to manage multiple hazards in a school environment during a public health emergency. This and other measures in the Children & Other At-Risk Populations sub-domain provide an indication of the level of school emergency and disaster planning.

Data Source

Save the Children. *2014 U.S. Report Card on Children in Disasters*. 2014. Additional details about this measure are available from the source. Save the Children annually has conducted research on regulations and child care licensing laws for all 50 states and the District of Columbia since 2008.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Validity and reliability of related measure have been established through prior studies.

Community Planning & Engagement

Children & Other At-Risk Populations

{Percentage of} hospital facilities {in the state} that provide indigent care

ID	M260	Type	Process
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure provides information on the availability of hospital-based healthcare services that are owned or provided by the hospital or by the hospital's health system for the indigent population, and are not subject to contractual agreement. Hospitals that provide care to indigent populations may be better positioned to provide care to these populations during an emergency because of a previous care-based relationship.

Limitations of Measure

The data source is primarily used to facilitate sales, planning, and marketing activities; it is not focused on preparedness. When data are missing, estimates are generated from previous year's responses, so some information may be inaccurate. However, given that the report is produced annually by the American Hospital Association (AHA) and has been relied on by government agencies since 1946, the limitations of the measure do not outweigh its value.

Use of Measure

The measure is an indicator of healthcare services for uninsured and underinsured persons where care is free of charge or charged on a sliding scale and where, otherwise, those that are uninsured or underinsured may not seek or be able to afford services. This would include "free clinics" staffed by volunteer practitioners, but could also be staffed by employees with the sponsoring healthcare organization subsidizing the cost of service.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies data directly from the source. For more information, contact the [org](#).

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure despite evidence of acceptable validity from multi-trait scale analysis and internal consistency reliability tests. This measure reflects a construct that is different from the intended capability, possibly causing Index composite scores to be misleading. Although intended to indicate the capability to treat underserved populations, this measure actually reflects the proportion of hospitals in a state that lack an emergency department, because the federal EMTALA law requires all ED-equipped hospitals to provide services regardless of ability to pay. Hospitals without EDs are by definition specialty hospitals or long-term acute care (LTAC) hospitals, and their prevalence within a state is unlikely to be correlated with the intended capability. Superior measures of access to care for the uninsured exist, such as the annual BRFSS measure of forgoing needed care due to cost.

Community Planning & Engagement

Children & Other At-Risk Populations

{Number of} pediatricians, general {per 100,000 adolescent population}

ID	M163	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Pediatricians are specially trained to provide medical care to children. These skills are particularly needed to provide care to children that have serious injuries or illnesses associated with mass casualty events and disease outbreaks. The measure focuses on the state's workforce capacity of pediatricians capable of providing specialized children's medical care.

Limitations of Measure

The measure does not indicate how healthcare facilities and jurisdictions may have mutual aid plans in place to supplement the number of pediatricians in the event of an emergency.

Use of Measure

The measure is a proxy for the pediatrician workforce's ability to surge following an emergency event. The measure should be viewed alongside other measures in the Children & Other At-Risk Populations sub-domain to indicate the pre-event capacity of the community system to surge following an emergency.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests.

Data Type Quantitative

Data Integration Number per 100,000

Data Normalization State score divided by target

Community Planning & Engagement

Children & Other At-Risk Populations

{Number of} obstetricians and gynecologists {per 100,000 female population}

ID	M164	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Obstetricians and gynecologists are specially trained to provide medical care to pregnant women and prenatal care. These skills are particularly needed to provide care to women who have serious injuries or illness associated with mass casualty events and disease outbreaks. The measure focuses on the state's personnel capacity of obstetricians and gynecologists to provide specialized women and prenatal healthcare.

Limitations of Measure

Healthcare facilities and jurisdictions may have mutual aid plans in place to supplement the number of obstetricians and gynecologists in the event of an emergency.

Use of Measure

The measure is a proxy for obstetrics and gynecological medical workforce ability to surge during a disaster, providing specialized care to women and prenatal women. The measure should be viewed alongside other measures in the Children & Other At-Risk Populations sub-domain to indicate the pre-event capacity of the community system to surge following an emergency.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity from multi-trait scale analysis and internal consistency reliability tests. Prior studies have confirmed validity and reliability of this measure (although not as an indicator of preparedness planning & community engagement for at-risk populations).

Community Planning & Engagement

Children & Other At-Risk Populations

{Number of} pediatric trauma centers {per 100,000 adolescent population}

ID	M170	Type	Structure
Measure last updated	2009 (2006 data)	Obtained for the Index	Feb-13

Rationale for Measure

Treatment of traumatic injury to children requires specialized skill and resources. The measure focuses on medical infrastructure and, by inference, trained staff capable of providing specialized care to pediatric trauma patients.

Limitations of Measure

The measure reflects a population-adjusted number of pediatric trauma centers, but it does not indicate the number of available pediatric trauma beds or inpatient treatment beds for the care of pediatric patients. The measure may underrepresent pediatric trauma resources that can be available during an emergency, because neighboring states may have pediatric trauma centers that are located nearby and can surge to provide necessary care.

Use of Measure

The measure is an indicator of a state's infrastructure capability to handle pediatric trauma patients. The measure should be viewed alongside other measures in the Children & Other At-Risk Populations sub-domain to indicate the state's capacity to provide appropriate medical care surge during an emergency.

Data Source

American Trauma Society (ATS). TraumaMaps.org: Pediatric Level 1-2 Trauma Centers. 2009. Additional details about this measure are available from the source. Data on location and level of pediatric trauma centers are from the 2006 University of Pennsylvania *Pediatric Trauma Database*, which includes all U.S. hospitals accredited as pediatric trauma centers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Modify measure to address poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests, and to accommodate an updated data source collected annually (CMS). For many children, the closest pediatric trauma center lies across a state border, reducing the validity and reliability of this measure as currently constructed. Use an alternative specification, such as: proportion of state's children under 21 who reside within 75 miles of a pediatric trauma center.

Community Planning & Engagement

Children & Other At-Risk Populations

Does the licensing agency in your state have policies/training for disaster and emergency planning for childcare licensing staff?

ID	M261	Type	Process
Measure last updated	2013 (2011–2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

It is important that states have policies and disaster and emergency planning training for staff that are engaged in childcare licensing. Regulatory staff that implement policies and have been trained in disaster and emergency planning are more likely to be capable of providing effective regulatory oversight to licensed childcare facilities, thus improving the facilities' compliance with emergency preparedness requirements.

Limitations of Measure

The measure is an indicator of a state's capability to provide regulatory oversight of childcare facilities; however, it is not a measure of a facility's compliance with those requirements. The measure does not evaluate emergency planning for children outside of regulated facilities.

Use of Measure

State childcare licensing regulations and monitoring and enforcement policies help provide a baseline of protection for the health and safety of children in out-of-home care. The measure should be viewed with other measures in the Children & Other At-Risk Populations sub-domain, particularly those that deal with regulated childcare facilities, to evaluate a state's level of preparedness for regulated childcare facilities.

Data Source

National Association for Regulatory Administration (NARA). *The 50-State Child Care Licensing Study*. 2013 (2011–2013 data). Additional details about this measure are available from the source. NARA partnered with the U.S. Department of Health and Human Services (HHS), the Office of the Administration for Children and Families (OACF), the Office of Child Care (OCC), and the National Center of Child Care Quality Improvement (NCCCQI) to produce this study. A previous study was conducted 2005–2008.

Target Setting

Subject matter expert opinion

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests, and lack of updated data within a 3 year periodicity cycle.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Community Planning & Engagement

Children & Other At-Risk Populations

State requires childcare homes, groups, and centers to: perform general emergency drill; {have} evacuation plans for general emergencies; {have} natural disaster-related emergency plan; {and have a} utility-related emergency plan

ID	M262	Type	Process
Measure last updated	2013 (2011–2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure indicates that the state has requirements that childcare homes, groups, centers have plans for specific types of emergencies, and that the facilities participate in a general drill to test the plans.

Limitations of Measure

The measure only considers a limited set of defined emergency plan types and that the state requires a general emergency drill. The measure does not seek to evaluate the quality of the required plans, how robust the performed drill was, or if an after-action report was completed.

Use of Measure

State childcare licensing regulations and monitoring and enforcement policies help establish a baseline of protection for the health and safety of children in out-of-home care. This measure indicates that a state has emergency preparedness as a part of their childcare regulatory program.

Data Source

National Association for Regulatory Administration (NARA). *The 50-State Child Care Licensing Study*. 2013 (2011–2013 data). Additional details about this measure are available from the source. NARA partnered with the U.S. Department of Health and Human Services (HHS), Office of the Administration for Children and Families (OACF), Office of Child Care (OCC), National Center of Child Care Quality Improvement (NCCCQI) to produce this study. A previous study was conducted 2005–2008.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of requirements out of four

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests, and lack of updated data within a 3 year periodicity cycle.

Community Planning & Engagement

Children & Other At-Risk Populations

State requires that all childcare providers have a family-child reunification plan

ID	M50	Type	Process
Measure last updated	2014	Obtained for the Index	Oct-14

Rationale for Measure

The state requires that all childcare providers have a written plan for emergency notification of parents and reunification of families following an emergency. A state may have multiple classes of childcare with separate regulations and the standard must apply to all regulated childcare providers.

Limitations of Measure

There is a mix of templates/guidelines aimed at childcare centers/facility types and a variety of public website information intended for families. The target audience is not consistent and providing general information does not constitute having a family reunification plan in place.

Use of Measure

The use of this single measure is limited; this measure should be viewed in concert with the other measures in the Children & Other At-Risk Populations sub-domain. This measure describes a state's capability to require planning of childcare providers and families with children in childcare to prepare for and respond effectively to an emergency.

Data Source

Save the Children. *2014 U.S. Report Card on Children in Disasters*. 2014. Additional details about this measure are available from the source. Save the Children has conducted annual research on regulations and childcare licensing laws for all 50 states and the District of Columbia since 2008.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Community Planning & Engagement

Children & Other At-Risk Populations

State requires that all childcare providers have a plan for evacuating and safely moving children to an alternate site

ID	M51	Type	Process
Measure last updated	2014	Obtained for the Index	Oct-14

Rationale for Measure

During emergencies it is important that childcare facilities have a pre-identified alternate site to move to in case the primary facility is required to evacuate. The state must require that all childcare providers have a written plan for evacuating and safely moving children to an alternate site. The plan must include provisions for multiple types of hazards. Many states have different licensing requirements and regulations for different kinds of providers. To meet the standard, a requirement must be in place for all categories of childcare providers.

Limitations of Measure

There is a mix of templates/guidelines aimed at childcare centers/facility types and a variety of public website information aimed at families. The target audience is not consistent and providing general information is not necessarily an indicator that the childcare facility preparedness plans have identified an adequate alternate site in the event of an emergency evacuation.

Use of Measure

The use of this single measure is limited; this measure should be used with other measures in the Children & Other At-Risk Populations sub-domain to evaluate a state's childcare provider regulatory program and improve the emergency preparedness capabilities of the childcare providers they regulate.

Data Source

Save the Children. *2014 U.S. Report Card on Children in Disasters*. 2014. Additional details about this measure are available from the source. Save the Children has conducted annual research on regulations and childcare licensing laws for all 50 states and the District of Columbia since 2008.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Community Planning & Engagement

Children & Other At-Risk Populations

{Number of} assisted living and residential care units per 1,000 population aged 65 and older

ID	M263	Type	Structure
Measure last updated	2014 (2012–2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure identifies the relative capacity of assisted living and residential care units in a state and provides general awareness of a population of vulnerable individuals.

Limitations of Measure

The measure can be a general indicator of the number of vulnerable residents that would need support in an emergency, but does not differentiate by functional needs (mobility, hearing, speech, cognition, etc.), or identify locations in a way that would inform preparedness to protect and provide for the diverse needs of this population, especially during a long recovery phase. Also, it's not clear how a median value provides the most useful information.

Use of Measure

The measure provides general baseline data, but with more detail it could help inform planning for evacuation, specialized transport, alternative care sites, etc.

Data Source

AARP. The Commonwealth Fund. The SCAN Foundation. *Raising Expectations: A State Scorecard on Long-Term Services and Supports for Older Adults, People with Disabilities, and Family Caregivers*. 2014 (2012–2013 data). Additional details about this measure are available from the source. Assisted living and residential care unit data are from state licensing websites, the 2013 AARP Public Policy Institute Assisted Living and Residential Care Survey, and U.S. Census Bureau 2012 population estimates. Data are not available for Connecticut because the state licenses assisted living service agencies (ALSAs) rather than facilities, and the numbers of units covered by ALSAs are not reported.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 1,000 population aged
Data Normalization	State score divided by target

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Results and prior studies indicate this measure is likely to be an indicator of vulnerability rather than capability (i.e. inversely correlated with availability of home, community, and family supports and inversely correlated with preparedness).

Community Planning & Engagement

Children & Other At-Risk Populations

The state Child Care and Development Fund lead agency has developed and/or distributed {disaster preparedness} resources to prepare families and providers

ID	M264	Type	Process
Measure last updated	2010–2011	Obtained for the Index	Jul-14

Rationale for Measure

The measure serves as an indication that the state lead agency is contributing to and facilitating emergency preparedness planning for children, families, and childcare providers.

Limitations of Measure

The measure is limited to children and families that are using childcare providers. The measure does not evaluate the quality of the preparedness resources provided or if the resources were used by the providers to improve their level of preparedness. The measure has a limited focus; other at-risk populations not addressed.

Use of Measure

The measure adds to the overall picture of activities and/or resources that contribute to emergency preparedness and response planning for children and families that rely on childcare facilities. It should be used with other measures in the Children & Other At-Risk Populations sub-domain that are focused on children to evaluate the state's level of preparedness in mitigating the adverse effects of health security events on children.

Data Source

U.S. Department of Health and Human Services (HHS). Office of the Administration for Children and Families (OACF). Office of Child Care (OCC). *State and Territory Responses to Emergency Preparedness Planning Questions in the FY 2010–2011 CCDF Plan Preprint*. 2010–2011. Additional details about this measure are available from the source. Data were collected through the OACF Child Care and Development Fund plan (CCDF).

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests, and lack of updated data within a 3 year periodicity cycle.

Community Planning & Engagement

Management of Volunteers during Emergencies

State participates in Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) Program {and has a state volunteer registry}

ID	M36	Type	Process
Measure last updated	2014	Obtained for the Index	Sep-14

Rationale for Measure

The measure focuses on participation in a standard national system to verify health volunteer identification and credentials through preregistration before an emergency occurs.

Limitations of Measure

The measure reflects whether a mechanism for a state volunteer registry exists, but not whether it has been managed well (e.g., kept current), leveraged effectively, or used at all during exercises or responses. The measure also may or may not accurately reflect a state's capacity for volunteer surge during emergencies.

Use of Measure

The measure is a proxy for a state's ability to preregister volunteer health professionals.

Data Source

Assistant Secretary for Preparedness and Response (ASPR). *The Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP)*. 2014. Additional details about this measure are available from the source. The ESAR-VHP Program was established in 2002 and continues to accept volunteers through registration in each state.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to lack of variation across states and poor performance as indicator of capability. Measure reflects a low performance threshold that all states already meet, contributing to poor measure sensitivity and specificity. Pending data availability, measures should be replaced with a superior measure of volunteer mobilization capability: the number of professionals registered with ESAR-VHP per 100,000 state population.

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of} Community Emergency Response Teams (CERT) in the state {per 100,000 population}

ID	M266	Type	Structure
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Citizen Corps is a U.S. Department of Homeland Security initiative coordinated through the Federal Emergency Management Administration (FEMA) to engage, educate, and train volunteers to strengthen personal and community preparedness and response. Launched in 2002, Citizen Corps comprises a network of more than 1,200 county, tribal, state, and territorial councils and 2,400 registered Community Emergency Response Teams (CERT), which have completed specialized training. Citizen Corps has partner programs, which include Fire Corps (through FEMA and the National Volunteer Fire Council) and Volunteers in Police Service (through the International Association of Chiefs of Police).

Limitations of Measure

The success of volunteer efforts like Citizen Corps depends on strong leadership, support from local and governmental entities and agencies, and the engagement of multiple sectors. As such, the activity levels, outreach, breadth of training, and access to financial support for Citizen Corps efforts and councils will vary from location to location.

Use of Measure

The measure indicates the number of Citizen Corps partner programs in which a state participates. It should be viewed alongside other measures in the Management of Volunteers during Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Citizen Corps. Community Emergency Response Teams (CERT). *Directory of Community Response Teams by State*. 2014. Additional details about this measure are available from the source. Data were accessed from the Federal Emergency Management Agency (FEMA) Citizen Corps Program website which maintains information on CERT in each state.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000 population
Data Normalization	State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually. Pending geocoded data availability, modify measure to enhance sensitivity and specificity: percent of state population residing in a county with a CERT.

Community Planning & Engagement

Management of Volunteers during Emergencies

Medical Reserve Corps (composite measure of M-176, M-177, M-178, M-179, M-180, M-181, M-182, M-183, M-184, M-185, M-186, M-187, M-267, M-268, and M-269)

ID	M346	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered volunteers are vital to providing care to people with serious injuries or illnesses associated with mass casualty events and disease outbreaks.

Limitations of Measure

The MRC is not the only source of health and medical volunteers. Many states have alternate systems of registering, credentialing, and managing health and medical volunteers, including ESAR-VHP (Emergency System for the Advance Registration of Volunteer Health Professionals), and/or have other local, regional, or state-sponsored health and medical teams of volunteers not registered as MRCs. There may also be overlap or integration of these systems (e.g., MRC volunteers registered through ESAR-VHP systems). The measure may over-represent the number of active MRC volunteers and credentials. MRC units vary with regard to how current their registries of volunteers are, how many trainings or exercises volunteers have participated in, and how frequently credentials/licenses are verified.

Use of Measure

The measure is a composite of 15 measures (M176, M177, M-178, M-179, M-180, M-181, M-182, M-183, M-184, M-185, M-186, M-187, M-267, M-268, and M-269) that evaluate the type and number of MRC volunteers available in a state and 3 measures that indicate the MRC organization's capability. This measure should be viewed with other measures in the Management of Volunteers during Emergencies sub-domain to better understand the capacity and abilities of the state's volunteer management system.

Community Planning & Engagement

Management of Volunteers during Emergencies

Medical Reserve Corps (composite measure of M-176, M-177, M-178, M-179, M-180, M-181, M-182, M-183, M-184, M-185, M-186, M-187, M-267, M-268, and M-269)

(continued)

Data Source

Multiple. Described below. 2013. Measure M-346 is a composite measure of M-176, M-177, M-178, M-179, M-180, M-181, M-182, M-183, M-184, M-185, M-186, M-187, M-267, M-268, and M-269. Additional details about this measure are available from the sources. Measures M-176, M-177, M-178, M-179, M-180, M-181, M-182, M-183, M-184, M-185, M-186, and M-187 are from the Medical Reserve Corps (MRC), *MRC Units Database*, 2013. Data are reported by each Medical Reserve Corps (MRC) unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Measures M-267, M-268, and M-269 are from the National Association of County and City Health Officials (NACCHO), *Stronger Together: A National Network of Volunteers*, 2013. NACCHO collected data by a web survey emailed to every active MRC unit leader or designated alternate.

Target Setting

Statistically calculated

Data Type	Composite
Data Integration	Average of 15 measures
Data Normalization	Score (0–1)

Recommendation: Modify measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests, and lack of updated data within a 3 year periodicity cycle for all data elements derived from the NACCHO data source. Averaging a large number of occupation-specific per-capita MRC measures results in a composite measure with limited sensitivity and specificity. Replace this measure with a set of four measures having greater specificity: (1) the total number of MRC members per 100,000 population; (2) the proportion of MRC members who are physicians; (3) the proportion of MRC members who are nurses or advanced practice nurses; and (4) the proportion of MRC measures who are other health professionals.

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} physicians {per 100,000 population}

ID	M176	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered physicians are vital to providing care to people with serious injuries or illness associated with mass casualty events and disease outbreaks.

Limitations of Measure

The measure may over-represent the number of active MRC volunteer physicians and credentials. MRC units vary with regard to how current their registries of volunteers are, how many trainings or exercises volunteers have participate in, and how frequently credentials/licenses are verified.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer physicians who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} physician assistants {per 100,000 population}

ID	M177	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered physician assistants (PAs) have advanced education and can practice medicine and prescribe medications under a physician’s supervision. They are vital to providing emergency care to people during disease outbreaks and disasters with mass casualties.

Limitations of Measure

The measure may over-represent the number of active MRC PAs and their credentials. MRC units vary with regard to how current their registries of volunteers are, how many trainings or exercises their volunteers have participated in, and how frequently they verify volunteers’ credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer physician assistants who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state’s ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction’s response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type Quantitative

Data Integration Number per 100,000

Data Normalization State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} nurse practitioners {per 100,000 population}

ID	M178	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered nurse practitioners have advanced training in nursing and can prescribe some medications under a physician's supervision. They are vital to providing emergency care for people during disease outbreaks and disasters with mass casualties.

Limitations of Measure

The measure may over-represent the number of active MRC nurse practitioners and their credentials. MRCs vary from unit to unit with regard to how current their registries of volunteers are, how many trainings or exercises their volunteers have participated in, and how frequently they verify volunteers' credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer nurse practitioners who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} nurses {per 100,000 population}

ID	M179	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered nurses are vital to providing emergency care for ill or injured people during a disaster or disease outbreak.

Limitations of Measure

The measure may over-represent the number of active MRC nurses and their credentials. MRC units vary with regard to how current their registries of volunteers are, how many trainings or exercises their volunteers have participated in, and how frequently they verify volunteers' credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer nurses who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} pharmacists {per 100,000 population}

ID	M180	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. Pharmacists specially trained in disaster response may play a role in managing and dispensing medical countermeasures (e.g., antivirals and antibiotics) and may also administer vaccines.

Limitations of Measure

The measure may over-represent the number of active MRC volunteer pharmacists and their credentials. MRC units vary regarding how current their registry of volunteers are, how many trainings or exercises volunteers have participate in, and how frequently credentials/licenses are verified.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer pharmacists who may have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} dentists {per 100,000 population}

ID	M181	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered dentists can provide emergency care of dental injuries and problems during a disaster. They may also be called upon to administer vaccines or other shots.

Limitations of Measure

The measure may over-represent the number of active MRC dentists and their credentials. MRCs vary from unit to unit with regard to how current their registries of volunteers are, how many trainings or exercises their volunteers have participated in, and how frequently they verify volunteers' credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer dentists who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} veterinarians {per 100,000 population}

ID	M182	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered veterinarians assess and provide emergency treatment for pets, livestock, and other animals during a disaster.

Limitations of Measure

The measure may over-represent the number of active MRC veterinarians and their credentials. MRC units vary with regard to how current their registries of volunteers are, how many trainings or exercises their volunteers have participated in, and how frequently they verify volunteers' credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer veterinarians who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers during Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} mental health professionals {per 100,000 population}

ID	M183	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. Mental health professionals with disaster response training may be needed during an emergency event to evaluate and treat individuals, families, and disaster responders experiencing distress and anxiety about safety, health, and recovery.

Limitations of Measure

The measure may over-represent the number of active MRC volunteer mental health professionals and their credentials. MRCs vary from unit to unit with regard to how current their registries of volunteers are, how many trainings or exercises volunteers have participate in, and how frequently credentials/licenses are verified.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer mental health professionals who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type Quantitative

Data Integration Number per 100,000

Data Normalization State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} emergency medical services (EMS) (prehospital care) professionals {per 100,000 population}

ID	M184	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered prehospital care emergency medical services (EMS) professionals are critical first responders during events with mass casualties or severe and widespread illness.

Limitations of Measure

The measure may over-represent the number of active MRC EMS providers and their credentials. MRCs vary from unit to unit with regard to how current their registries of volunteers are, how many trainings or exercises their volunteers have participated in, and how frequently they verify volunteers' credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer EMS professionals who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type Quantitative

Data Integration Number per 100,000

Data Normalization State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} respiratory therapists {per 100,000 population}

ID	M185	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC-registered respiratory therapists care for people who have trouble breathing from chronic illness and serious injuries or illness associated with mass casualty events and disease outbreaks.

Limitations of Measure

The measure may over-represent the number of active MRC volunteer respiratory therapists and their credentials. MRC units vary with regard to how current their registries of volunteers are, how much training or how many exercises their volunteers have participated in, and how frequently they verify volunteers' credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteer respiratory therapists who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers during Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} other public health/medical {per 100,000 population}

ID	M186	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. Other public health and medical professionals (e.g., epidemiologists, environmental engineers, toxicologists) can provide logistical support and information technology support as well as staff information hotlines and mass clinics, assist with registration, and perform health screening.

Limitations of Measure

The measure may over-represent the number of active MRC volunteers and their credentials. MRC units vary with regard to how current their registries of volunteers are, how many trainings or exercises their volunteers have participated in, and how frequently they verify volunteers' credentials/licenses.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local volunteers who have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type Quantitative

Data Integration Number per 100,000

Data Normalization State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Number of preregistered Medical Reserve Corps volunteer} nonpublic health/nonmedical {per 100,000 population}

ID	M187	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. Nonpublic health and nonmedical MRC volunteers provide logistical support for response activities such as mass clinics, where they may serve as greeters, ushers, and form reviewers.

Limitations of Measure

The measure may over-represent the number of active MRC volunteers. MRCs vary from unit to unit with regard to how current their volunteer registries are and how many trainings volunteers participate in.

Use of Measure

The measure indicates whether a state has engaged and coordinated a cadre of local nonpublic health and nonmedical volunteers who may have received special disaster training before an event and an estimated number of such volunteers available to respond during an emergency. It should be viewed alongside other measures in the Management of Volunteers During Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

Medical Reserve Corps (MRC). *MRC Units Database*. 2013. Additional details about this measure are available from the source. Data are reported by each MRC unit and can be accessed on the MRC website on a unit-by-unit basis. Search options allow state/territorial groupings of units, enabling calculation of state- and territorial-level data for all 50 states, the District of Columbia, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, Palau, Puerto Rico, and the U.S. Virgin Islands. States and territories update the data at their discretion, usually at least annually. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type Quantitative

Data Integration Number per 100,000

Data Normalization State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Average number of} training partners for Medical Reserve Corps {units in state}

ID	M267	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. Emergency response requires planning and practice. MRC units that partner with other organizations to provide training to their volunteers are likely to have more thorough training and to participate in jurisdictional drills and exercises. Partners may include: local health departments, emergency management agencies, American Red Cross, Citizen Corps, firefighters/emergency medical services, hospitals/health systems, and law enforcement officials.

Limitations of Measure

The number of training partners is not an indicator of effective training; rather, it is a measure of potential resources that may help provide the needed training to a MRC unit. States have health and medical volunteer programs and teams that are not associated with the national MRC.

Use of Measure

The measure should be used with other measures of MRC capacity and volunteer management to gain a better understanding of MRC capabilities and capacities. In using MRC measures, it is important to know that MRC units may only be a portion of health and medical volunteers available in programs in the state.

Data Source

National Association of County and City Health Officials (NACCHO). *Stronger Together: A National Network of Volunteers*. 2013. Additional details about this measure are available from the source. NACCHO collected data by a web survey emailed to every active MRC unit leader or designated alternate.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	State average for training partners per unit
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Percentage of} Medical Reserve Corps units {in the state} that have a succession plan in place for leader transition or turnover

ID	M268	Type	Process
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC unit leaders are mostly full-time employees of the sponsoring organization and are important to the success of the MRC unit. Turnover is an issue that faces all public agencies. With 67% of all MRC units based in a local health department, having a succession plan can help mitigate the challenges of leader transitions or turnover. Successfully meeting those challenges can influence the effectiveness of an MRC unit.

Limitations of Measure

The measure describes whether or not a MRC unit has a succession plan. The measure does not indicate the quality or completeness of the plan.

Use of Measure

The measure should be viewed alongside other measures in the Management of Volunteers during Emergencies sub-domain to indicate a state's ability to coordinate the recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support a jurisdiction's response to health emergencies.

Data Source

National Association of County and City Health Officials (NACCHO). *Stronger Together: A National Network of Volunteers*. 2013. Additional details about this measure are available from the source. NACCHO collected data by a web survey emailed to every active MRC unit leader or designated alternate.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Community Planning & Engagement

Management of Volunteers during Emergencies

{Percentage of} Medical Reserve Corps units {in the state} reporting participation in preparedness activities

ID	M269	Type	Process
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The Medical Reserve Corps (MRC) is a national system of local, community-based teams of volunteers—medical and public health professionals and others without health backgrounds—who are identified, credentialed, trained, and prepared in advance of an emergency. MRC units provide resources to jurisdictions to conduct important preparedness activities. Activities include such areas as: training and exercises, personal preparedness information campaigns, communications/texting drills, points of dispensing (PODs), National Preparedness Month, general shelter operation/support, Strategic National Stockpile, pandemic influenza planning, psychological first aid/behavioral health, shelter for people with functional needs, hospital surge capacity, alternate care sites, pet shelter, and vector control.

Limitations of Measure

Not all jurisdictions have MRC units. Some states have state-sponsored medical response teams and volunteer programs that are not affiliated with the national MRC.

Use of Measure

The measure should be used to indicate the involvement of MRC units in enhancing the preparedness activities in the jurisdictions that have MRC units. Engaging volunteers in preparedness activities keeps the volunteer in the MRC active and more willing to respond to health emergencies. It should be viewed alongside other measures in the Management of Volunteers during Emergencies sub-domain to indicate a state's ability to coordinate the identification, recruitment, registration, credential verification, training, and engagement of healthcare, medical, and support staff volunteers to support the jurisdiction's response to incidents of health significance.

Data Source

National Association of County and City Health Officials (NACCHO). *Stronger Together: A National Network of Volunteers*. 2013. Additional details about this measure are available from the source. NACCHO collected data by a web survey emailed to every active MRC unit leader or designated alternate.

Target Setting

Statistically calculated

Recommendation: See recommendation for measure M346 above.

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Community Planning & Engagement

Social Capital & Cohesion

{Percentage of} residents doing favors for neighbors

ID	M172	Type	Structure
Measure last updated	2011	Obtained for the Index	Aug-13

Rationale for Measure

Social cohesion is the sense of connectedness and belonging in a community and is positively correlated to faster recovery rates. This measure of residents doing favors for neighbors is a proxy measure for people who already know their neighbors and are inclined to provide assistance to them.

Limitations of Measure

The measure is self-reported and may be subject to reporting bias; respondents may feel compelled to appear more connected to neighbors than they actually are.

Use of Measure

As a proxy, the measure's strength lies in combining and interpreting it with other measures in the Social Capital & Cohesion sub-domain. The combined effects of social capital and cohesion (e.g., information/situational awareness, access to services and resources, trust in leadership and others in a community, pride in belonging to one's community, strong relationship to place, and positive interactions across and with other communities) have been shown to improve both the rates of recovery in communities and increase the quality of recovery post-event.

Data Source

Corporation for National and Community Service (CNCS). *Volunteering and Civic Life in America: Civic Engagement Supplement of the Current Population Survey*. 2011. Additional details about this measure are available from the source. Data are from the *Civic Engagement Supplement of the Current Population Survey*. This supplement, which includes questions sponsored by the CNCS, has been conducted by the U.S. Census Bureau every November since 2008, except for November 2012. This question was not included in the supplement after 2011. State-level data for all 50 states and the District of Columbia can be accessed from the CNCS website.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Community Planning & Engagement

Social Capital & Cohesion

Percentage of residents eating dinner with their family at least a few times a week

ID	M173	Type	Structure
Measure last updated	2011	Obtained for the Index	Aug-13

Rationale for Measure

Social cohesion is the sense of connectedness and belonging in a community, which is positively correlated to faster recovery rates. The family unit is a major contributor to stable communities, and families who eat dinner together have been linked to improved outcomes (e.g., better health, improved school achievement). The measure of residents who eat dinner with their families a few times a week is a proxy for people who conduct stable routines within a household, (such as cooking, another indicator of stability) and may be more inclined to be socially connected to other people within their households.

Limitations of Measure

The measure is limited in that many cohesive families may not be able to have dinner together (although they may have breakfast together).

Use of Measure

As a proxy, the measure's strength lies in combining and interpreting it with other measures in the Social Capital & Cohesion sub-domain. The combined effects of social capital and cohesion (e.g., information/situational awareness, access to services and resources, trust in leadership and others in a community, pride in belonging to one's community, strong relationship to place, and positive interactions across and with other communities) have been shown to improve both the rates of recovery in communities and increase the quality of recovery post-event.

Data Source

Corporation for National and Community Service (CNCS). *Volunteering and Civic Life in America: Civic Engagement Supplement of the Current Population Survey*. 2011. Additional details about this measure are available from the source. Data are from the *Civic Engagement Supplement of the Current Population Survey*. This supplement, which includes questions sponsored by the CNCS, has been conducted by the U.S. Census Bureau every November since 2008, except for November 2012. This question was not included in the supplement after 2011. State-level data for all 50 states and the District of Columbia can be accessed from the CNCS website.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests, and lack of updated data within a 3 year periodicity cycle.

Community Planning & Engagement

Social Capital & Cohesion

{Percentage of} children living in neighborhoods that are supportive

ID	M174	Type	Structure
Measure last updated	2012 (2010–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Social cohesion is the sense of connectedness and belonging in a community, which is positively correlated to faster recovery rates. The measure can provide insight into a community's pre-event functioning and available resources, which in turn translate into the recovery time and quality of recovery experienced by residents during and following an event. It may also be a proxy for the stability that comes from longstanding communities.

Limitations of Measure

The measure has no apparent limitations.

Use of Measure

As a proxy, the measure's strength lies in combining and interpreting it with other measures in the Social Capital & Cohesion sub-domain. The combined effects of social capital and cohesion (e.g., information/situational awareness, access to services and resources, trust in leadership and others in a community, pride in belonging to one's community, strong relationship to place, and positive interactions across and with other communities) have been shown to improve both the rates of recovery in communities and increase the quality of recovery post-event.

Data Source

Health Resources and Services Administration (HRSA). Maternal and Child Health Bureau (MCHB). *National Survey of Children's Health (NSCH) 2011/12*. 2012 (2010–2012 data). Additional details about this measure are available from the source. NSCH is conducted by CDC's National Center for Health Statistics through the *State and Local Area Integrated Telephone Survey (SLAITS)*. Surveys were conducted in 2003, 2007, and 2011, covering the 50 states and the District of Columbia. State-level data are readily accessible on the Data Resource Center for Child and Adolescent Health website.

Target Setting

Statistically calculated

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Pending further validity tests, replace with a measure of racial residential segregation.

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Community Planning & Engagement

Social Capital & Cohesion

Voting-eligible population highest office turnout rate

ID	M175	Type	Outcome
Measure last updated	2013 (2010–2011 data)	Obtained for the Index	Jul-14

Rationale for Measure

Social cohesion is the sense of connectedness and belonging in a community, which is positively correlated to faster recovery rates. Residents who vote have long been associated with more cohesive communities. The measure is considered a proxy for community involvement, trust in government (and associated processes), and engagement.

Limitations of Measure

No noted limitations. The measure has been used repeatedly in multiple areas to assess social cohesion and, specifically, civic engagement.

Use of Measure

The measure is associated with a community's trust in leadership and in government (particularly voting processes) which can act as facilitators of both the rate and quality of recovery in communities after an event. The measure is relevant to health security preparedness as it reflects participation in a routinely established civic event. It is assumed that communities that have high voting turnout are more likely to collectively organize following a disaster.

Data Source

United States Election Project. *2012 General Election Turnout Rates*. 2013 (2010–2011 data). Additional details about this measure are available from the source. The measure is available at the U.S. Elections Project website and is calculated using a variety of sources, including the U.S. Census Bureau, the Bureau of Justice Statistics, and the Bureau of Consular Affairs. Measure data are calculated biennially for the 50 states and the District of Columbia since 1980.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Rate expressed as a percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Modify due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Recalculate as a measure of voter participation rather than registered voter turnout: percent of population 18 and holder voting in the most recent statewide election. Validity and reliability of the measure for this construct has been established by prior studies.

Community Planning & Engagement

Social Capital & Cohesion

{Annual adult} volunteer rate

ID	M188	Type	Structure
Measure last updated	2014 (2012 data)	Obtained for the Index	Jun-14

Rationale for Measure

Community residents who volunteer, like those who vote, have long been associated with more cohesive communities. Rate of volunteerism is considered a proxy for community involvement and engagement, which would apply pre-event, as well as during and following a disaster.

Limitations of Measure

The measure may be subject to reporting bias; respondents may be inclined to over-report their rates of volunteerism. In addition, the measure doesn't reflect how often residents volunteer. The sustainability or regularity with which a person (or community) volunteers may translate into a stronger, more resilient community during and following a disaster.

Use of Measure

The measure approximates a community's likelihood to demonstrate emergent collective behavior (i.e., the spontaneous organization at the community level to address post-disaster needs). It is also a proxy for community residents' pride, trust in leadership and other community members, and their relationship to place—all of which could have a positive effect following a disaster or event. As a proxy measure, its strength lies in combining and interpreting it with other measures in the Social Capital & Cohesion sub-domain. The combined effects of Social Capital & Cohesion (e.g., information/situational awareness, access to services and resources, trust in leadership and others in a community, pride in belonging to one's community, strong relationship to place, and positive interactions across and with other communities) have been shown to improve both the rates of recovery in communities and increase the quality of recovery post-event.

Data Source

Corporation for National and Community Service (CNCS). *Volunteering and Civic Life in America: Volunteer Supplement of the Current Population Survey*. 2014 (2012 data). Additional details about this measure are available from the source. Data are from the Volunteer Supplement of the Current Population Survey. This supplement, which includes questions sponsored by the CNCS, has been conducted annually by the U.S. Census Bureau since 2005. State-level data for all 50 states and the District of Columbia can be accessed from the CNCS website.

Target Setting

Statistically calculated

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Data Type	Quantitative
Data Integration	Rate expressed as a percentage (0–100)
Data Normalization	State score divided by target

Community Planning & Engagement

Social Capital & Cohesion

Average volunteer hours per resident {per year}

ID	M189	Type	Outcome
Measure last updated	2014 (2012 data)	Obtained for the Index	Jun-14

Rationale for Measure

Community residents who volunteer, like those who vote, have long been associated with more cohesive communities. This measure is another way of indirectly capturing the community-level benefits derived from those who “give back” or volunteer their time.

Limitations of Measure

The measure may be subject to reporting bias; respondents may be inclined to over-report the number of hours they perform volunteer work. Therefore, the benefits that extend to the rest of a community may not be accurate. In addition, this average may reflect lower numbers in certain communities that actually do have strong social cohesion, such as settings where both parents work full-time and may not have time to volunteer.

Use of Measure

The measure is best interpreted in combination with other proxy measures in the Social Capital & Cohesion sub-domain. As part of a group of social cohesion measures, this measure alludes to (1) the likelihood that a community will be willing to “give back” or volunteer their time, both before and potentially during/after a disaster; and (2) any broader or indirect benefits that arise when people are part of communities that have higher rates of volunteerism.

Data Source

Corporation for National and Community Service (CNCS). *Volunteering and Civic Life in America: Volunteer Supplement of the Current Population Survey*. 2014 (2012 data). Additional details about this measure are available from the source. Data are from the Volunteer Supplement of the Current Population Survey. This supplement, which includes questions sponsored by the CNCS, has been conducted annually by the U.S. Census Bureau since 2005. State-level data for all 50 states and the District of Columbia can be accessed from the CNCS website.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Average hours per resident per year
Data Normalization	State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Community Planning & Engagement

Social Capital & Cohesion

Rate of volunteer retention

ID	M190	Type	Outcome
Measure last updated	2014 (2012 data)	Obtained for the Index	Jun-14

Rationale for Measure

The measure reflects the extent to which volunteers are retained over time. Community residents who volunteer, like those who vote, have long been associated with more cohesive communities. The measure is another way of indirectly capturing the sustainability of community-level benefits derived from those who volunteer. If levels of volunteerism are sustained, this contributes to the stability of a community and the likelihood that they will recover more quickly.

Limitations of Measure

Tracking retention rates relies on a state being able to maintain volunteer records. If a given state is unable to do so, retention rates as reported may over- or under-represent the actual percentage.

Use of Measure

As with other social cohesion measures, volunteer retention should indicate the potential stability and cohesion of a given community because it demonstrates the likelihood that people will continue to volunteer. Longstanding volunteerism runs parallel in influence with other stabilizing community factors, such as permanent housing, strong schools, and ongoing civic engagement, and thus is a valuable indicator when interpreted and observed in combination with other social capital measures.

Data Source

Corporation for National and Community Service (CNCS). *Volunteering and Civic Life in America: Volunteer Supplement of the Current Population Survey*. 2014 (2012 data). Additional details about this measure are available from the source. Data are from the Volunteer Supplement of the Current Population Survey. This supplement, which includes questions sponsored by the CNCS, has been conducted annually by the U.S. Census Bureau since 2005. State-level data for all 50 states and the District of Columbia can be accessed from the CNCS website.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests.

Incident & Information Management

Incident Management & Multi-Agency Coordination

Have you utilized a rapid method (e.g., Health Alert Network (HAN), blast e-mail or fax) to send messages to your sentinel clinical laboratories and other partners?

ID	M10	Type	Process
Measure last updated	2013 (2012–2013 data)	Obtained for the Index	Aug-14

Rationale for Measure

The measure focuses on a state public health laboratory's ability to effectively transmit information rapidly and electronically to partners and coordinate response activities.

Limitations of Measure

The measure does not reflect the frequency with which a rapid method may be used regularly and/or in emergencies or whether this function has been tested by a jurisdiction. It mainly reflects an existing capacity to communicate via a single medium (electronic) and in one direction (outward).

Use of Measure

The measure is a proxy for effective transmittal and information sharing and coordination with partners through electronic systems.

Data Source

Association of Public Health Laboratories (APHL). *All-Hazards Laboratory Preparedness Survey*. 2013 (2012-2013 data). Additional details about this measure are available from the source. Data are available through the Centers for Disease Control and Prevention's (CDC) APHL agreement. Data were collected in a 2013 survey, which covered July 1, 2012 to June 30, 2013. Although this measure is new in the *All-Hazards Laboratory Preparedness Survey*, APHL has collected this data source for the past six years and the measure was selected based on the longevity of the *Comprehensive Laboratory Services Survey* (CLSS) and the *All-Hazards Laboratory Preparedness Survey*. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Measure reflects a low performance threshold that is likely to be exceeded in all states, raising questions about the accuracy of non-affirmative responses.

Incident & Information Management

Incident Management & Multi-Agency Coordination

Degree to which state has a dispensing prophylaxis plan in place that accounts for all operational elements of a local mass prophylaxis/dispensing plan

ID	M70	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the operational coordination elements of mass prophylaxis and dispensing plans. Elements included that require operational coordination are staffing, scheduling, volunteer management, and a policy for assisting and including children and other at-risk populations into the response plan. It demonstrates multiagency coordination, information management, and incident coordination.

Limitations of Measure

The measure focuses narrowly on operational coordination topics and does not include other items such as mutual aid and resource planning. The measure is also incident-specific.

Use of Measure

The measure is a proxy for the ability to coordinate prophylaxis for 100% of the population within a specified timeframe.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. A plan is unlikely to be a valid proxy for the capability of interest.

Data Type Quantitative

Data Integration Score (0–100)

Data Normalization State score divided by target

Incident & Information Management

Incident Management & Multi-Agency Coordination

Degree to which a state has a hospital and alternate care facilities coordination plan in place on how to procure emergency medical materiel

ID	M71	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure highlights the importance of multi-agency coordination between the public health and healthcare system. Inclusion of healthcare facilities into standardized incident management systems ensures the healthcare system understands the requesting process for resources through such mechanisms.

Limitations of Measure

The measure only focuses on procurement of materiel and does not address additional multi-agency coordination facets such as information sharing between the public health and healthcare systems. Additionally, this measure is only a measure of the planning component of such coordination, not the implementation or quality of such a plan.

Use of Measure

The measure focuses specifically on the request process development for hospital and alternate care facilities for emergency medical materiel.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and pending availability of updated data within 3-year periodicity cycle.

Data Type Quantitative

Data Integration Score (0–100)

Data Normalization State score divided by target

Incident & Information Management

Incident Management & Multi-Agency Coordination

State is Emergency Management Accreditation Program (EMAP)-accredited

ID	M84	Type	Process
Measure last updated	2014	Obtained for the Index	Oct-14

Rationale for Measure

The measure focuses on the accreditation of a state according to a set of 64 standards for emergency management programs that covers program management, administration and finance, laws and authorities, hazard identification, risk assessment and consequence analysis, hazard mitigation, prevention, operational planning, incident management, resource management and logistics, mutual aid, communications and warning, operations and procedures, facilities, training, exercises, and crisis communications. Each area is important for managing an incident and assuring multi-agency coordination.

Limitations of Measure

Accreditation is voluntary. Some jurisdictions choose to not seek Emergency Management Accreditation Program (EMAP) accreditation for various state and local reasons. States with conditional accreditation are not considered as accredited for this measure.

Use of Measure

The measure is an indicator of quality assurance of a state's emergency management system.

Data Source

Emergency Management Accreditation Program (EMAP). *Who Is Accredited?* 2014. Additional details about this measure are available from the source. Data are compiled in an EMAP map of accredited jurisdictions and states.

Target Setting

Subject matter expert opinion

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Incident & Information Management

Incident Management & Multi-Agency Coordination

State has an animal (livestock and pet) disaster preparedness plan

ID	M333	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Animals are impacted by the same disasters and emergencies as humans—natural and manmade, large and small. Whether it's a hurricane or a tornado, a flood or an earthquake, a chemical leak or an act of terrorism, planning is vital to response and recovery efforts during and after disasters.

Limitations of Measure

While a “yes” response regarding a state animal disaster preparedness plan indicates a commitment by the state to address the needs and other important considerations for animals during and following an emergency, the source data also captures additional information related to addressing animal needs that represent a commitment beyond a plan. This additional information varies from state to state and is not captured by “yes/no” responses; the information has the potential for a more quantifiable response.

Use of Measure

State and federal planning efforts are concerned with “all hazards/all species” within the United States. Preparing for disasters and emergencies involving animals, animal and public health, and other veterinary issues is an important consideration for preparedness and response.

Data Source

American Veterinary Medical Association (AVMA). *Animal Disaster Plans and Resources by State*. 2014. Additional details about this measure are available from the source. Data have been compiled by AVMA on the *Animal Disaster Plans and Resources by State* website.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and pending availability of updated data within 3-year periodicity cycle.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Incident & Information Management

Incident Management & Multi-Agency Coordination

{Number of} emergency management directors {per 100,000 population}

ID	M106	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

The measure focuses on identified emergency management directors within a given state to gauge the emergency management capacity available to assist in incident management and multi-agency coordination for events jeopardizing health security.

Limitations of Measure

The measure does not account for whether emergency management directors function only a specific, defined capacity or as part of a broader scope of job responsibilities (e.g., fire chief). The measure does not indicate the size (numbers and functions of staff) of the emergency management agency within a jurisdiction.

Use of Measure

The measure is a proxy for the emergency management system capacity in a given state. The measure should be viewed with other measures of capacity in the Incident Management & Multi-Agency Coordination sub-domain to aid in the understanding of the system capacity.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Measure has not been validated by prior studies.

Data Type Quantitative

Data Integration Number per 100,000

Data Normalization State score divided by target

Incident & Information Management

Incident Management & Multi-Agency Coordination

Percentage of local health departments with an emergency preparedness coordinator {for states with local health departments, excludes Rhode Island and Hawaii}

ID	M107	Type	Structure
Measure last updated	2014 (2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure estimates the capacity of the public health emergency management system by using emergency preparedness coordinators employed at local public health departments, or regional or district offices within the state, as the criteria.

Limitations of Measure

The measure is collected less frequently than annually. Additionally, some states do not have local health departments and therefore no local health department emergency management coordinators. Lastly, leadership roles themselves do not determine the quality or robustness of an emergency management system.

Use of Measure

The measure is a proxy for measuring the leadership capacity within the public health emergency management system. Note that “local public health departments” includes all jurisdictional municipal public health agencies and sub-state health department regional and district offices. Rhode Island and Delaware do not have any sub-state health organizational structure and do not provide any data for this measure.

Data Source

National Association of County and City Health Officials (NACCHO). *2013 National Profile of Local Health Departments*. 2014 (2013 data). Additional details about this measure are available from the source. NACCHO has conducted six profile studies since 1989. The profile studies have been funded by the Centers for Disease Control and Prevention and the Robert Wood Johnson Foundation. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure despite low construct validity from multi-trait scale analysis and internal consistency reliability tests. Measure has been validated for this construct through prior studies.

Incident & Information Management

Incident Management & Multi-Agency Coordination

State health agency participates in the Water Information Sharing and Analysis Center (WaterISAC)

ID	M222	Type	Process
Measure last updated	2013	Obtained for the Index	Oct-13

Rationale for Measure

The measure focuses on the state health agency's ability to share and receive communications regarding threat warnings and incident reports to water systems (part of the critical infrastructure) that can be used by government and its partners to inform incident management strategies.

Limitations of Measure

The measure itself focuses narrowly on information sharing pertaining to water-related incidents rather than intelligence information overall. The measure has no published target that specifically identifies that a state public health agency should participate. It does not take into account the other government or public/private water systems that participate in this program.

Use of Measure

The measure is a proxy for a state public health agency's ability to receive intelligence and share incident information amongst the government, private, and public sectors.

Data Source

Water Information Sharing and Analysis Center (WaterISAC). *State Agencies Participating in WaterISAC*. 2013. Additional details about this measure are available from the source. Data are provided by the WaterISAC program. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and pending availability of updated data within 3-year periodicity cycle.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Incident & Information Management

Incident Management & Multi-Agency Coordination

Does your {state public health} laboratory have ready access to current contact information as well as the capabilities of all sentinel clinical laboratories in your state?

ID	M227	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the ability of a state public health laboratory to coordinate appropriate services with multiple partners during an incident requiring the management of laboratory surge. The measure accomplishes this by focusing on the ability to have updated contact information for and knowledge of the capabilities of all sentinel laboratories within the jurisdiction.

Limitations of Measure

The measure does not explicitly account for availability of or agreement between laboratories to provide surge services during an emergency. The measure is also assumed to reference the state public health laboratory. In addition, contact information is not specified as meaning 24/7 or routine business hours.

Use of Measure

The measure is a proxy for a state's ability to coordinate information and tactics or services across multiple agencies during the management of a public health incident.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of options out of two: Both (1/2)=0.5, Neither (0/2)=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Measure reflects a low performance threshold that is likely to be exceeded in all states, raising questions about the accuracy of non-affirmative responses. Specification as a count variable introduces inconsistencies in scaling. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Incident & Information Management

Incident Management & Multi-Agency Coordination

In case of an emergency, does your {state public health} laboratory have a 24/7/365 contact system in place?

ID	M229	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the ability of a state to maintain a 24/7/365 contact system to receive notification of a public health emergency and activation of an incident management system that requires laboratory support.

Limitations of Measure

The measure narrowly focuses on a system only for the state public health laboratory and does not include the quality of the system in place.

Use of Measure

The measure is a proxy for measuring the availability of a state's public health agency to receive notification and activation messages pertaining to a public health emergency and the associated incident response 24/7/365.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Measure reflects a low performance threshold that is likely to be exceeded in all states, raising questions about the accuracy of non-affirmative responses. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Incident & Information Management

Incident Management & Multi-Agency Coordination

State participates in Hospital Available Beds for Emergencies and Disasters (HAvBED) Program

ID	MI50	Type	Process
Measure last updated	2012	Obtained for the Index	Feb-13

Rationale for Measure

The ability for a state to enter and actively update bed count numbers real-time through a consistent, nationally-accepted platform with standardized definitions is critical to surge (i.e., ramp up) management for a mass casualty or other type of incident.

Limitations of Measure

The measure requires data entry into the secure platform from existing state and local reporting systems used to measure bed counts during emergencies. The measure does not replace the need to evaluate state and local bed count system development and implementation.

Use of Measure

The measure indicates accurate, real-time representation of healthcare system capacity through standardized bed count reporting and assists in developing a common operating picture for a given public health emergency, particularly one of regional or national significance.

Data Source

Assistant Secretary for Preparedness and Response (ASPR). *National Hospital Available Beds for Emergencies and Disasters (HAvBED) System*. 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to no variation in the measure. Measure reflects a low performance threshold that is met or exceeded in all states, therefore its inclusion in the Index diminishes Index sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Incident & Information Management

Incident Management & Multi-Agency Coordination

Does state have a climate change adaptation plan?

ID	M334	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Climate change is already increasing global temperatures, leading to rising sea levels and more frequent and intense extreme weather events. These changes could affect coastlines, water supplies, human health, ecosystems, and more. Each community will be affected differently, so formal planning and concrete actions are needed to address these changes at both the state and local level. States and municipalities are recognizing the importance of preemptive action to address their vulnerabilities to climate change impacts. Many states have begun to address adaptation concerns either within broader climate action plans or through separate efforts.

Limitations of Measure

The measure is an indicator of state planning for climate change; however, it only indicates if a state has a plan. The quality of the plan is not evaluated. The degree to which the plan is being implemented is also not evaluated.

Use of Measure

The measure should be used as an indicator that the state has recognized that climate change is likely to have an effect on the state's infrastructure and is working to understand the vulnerabilities and considering mitigation activities.

Data Source

Center for Climate and Energy Solutions (C2ES). *State and Local Climate Adaptation*. 2014. Additional details about this measure are available from the source. C2ES updates the state climate adaptation map annually through review of state agency websites.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Incident & Information Management

Incident Management & Multi-Agency Coordination

{Degree to which} training, exercise, and evaluation plans are compliant with guidelines set forth by the Homeland Security Exercise and Evaluation Program

ID	M72	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Training, exercise, and evaluation plans are an important piece of preparedness. The Homeland Security Exercise and Evaluation Program (HSEEP) provides excellent information, guidelines, and templates to be used when designing exercises. The measure focuses on a jurisdiction's ability to conduct training, exercises, and evaluations of various aspects of preparedness and response plans.

Limitations of Measure

The measure does not address if adequate preparedness plans are in place. It also does not determine the degree to which response plans are tested and evaluated.

Use of Measure

Training, exercise, and evaluation plans developed using HSEEP will be more robust and complete. This indicates that jurisdictions have adequate training, exercise, and evaluation programs established for public health preparedness activities.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspl.org.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration (0–100 score)

Data Normalization State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Incident & Information Management

Incident Management & Multi-Agency Coordination

State has statewide and/or county animal response team(s)

ID	M335	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

Some states/provinces and local communities organize and coordinate animal disaster response resources through a state or county animal/agricultural response team. These groups are especially strong when they are integrated into the state/local emergency management system. RedRover often works alongside volunteers and leaders from these types of groups, and strongly believes in the animal response team concept and goals to improve emergency awareness, preparedness, and response. Trained RedRover Responder volunteers (and those interested in joining the volunteer corps) are encouraged to get involved with their local and regional animal response teams, as well as their local animal shelters.

Limitations of Measure

While a “yes” response indicates a state’s commitment to addressing the issues that arise regarding animals and pets during and following an emergency, the extent to which a team is integrated into the overall state plan and activities is not clearly indicated, nor is the resource commitment toward this team and this issue. There may be some ambiguity when considering this measure. The title implies a yes/no with regard to “a state team,” but the source listings include a mix of state, county, and local teams. In a few cases, it appears no state level team is indicated but one or more county teams are listed. A state that has answered “yes” should be interpreted to mean a state has any combination of state, regional, or county/local teams.

Use of Measure

The measure is an indicator of state/local planning and preparedness to respond to the issue of animal and pet care during and following a disaster or other emergency.

Data Source

RedRover. *Animal Response Teams*. 2013. Additional details about this measure are available from the source. RedRover maintains a list of state animal response teams.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Incident & Information Management

Incident Management & Multi-Agency Coordination

State has a fusion center

ID	M336	Type	Structure
Measure last updated	2014	Obtained for the Index	Jan-14

Rationale for Measure

A fusion center is a collaboration of multiple agencies that provide resources, expertise, and information to the center with the goal of maximizing their ability to detect, prevent, investigate, and respond to criminal and terrorist activity. State and major urban area fusion centers serve as primary focal points within the state and local environment for the receipt, analysis, gathering, and sharing of threat-related information among federal, state, local, tribal, and territorial partners. Fusion centers are uniquely situated to empower front-line personnel in law enforcement, public safety, fire service, emergency response, public health, critical infrastructure protection, and private sector security to lawfully gather and share threat-related information. They provide interdisciplinary expertise and situational awareness to inform decision-making at all levels of government.

Limitations of Measure

The measure indicates that the state has a fusion center. The measure does not indicate how many agencies/disciplines are represented in the fusion center. The measure does not provide information on how successful the center is at sharing information across disciplines.

Use of Measure

States that have a fusion center may be more likely to demonstrate cross-sector collaboration and information sharing. This is particularly true between the law enforcement/public safety sectors and public health and private sectors.

Data Source

U.S. Department of Homeland Security (DHS). *Fusion Center Locations and Contract Information*. 2014. Additional details about this measure are available from the source. DHS maintains a list of fusion centers.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Evidence of construct validity and reliability from prior studies does not exist. Pending data availability, replace with a measure having greater sensitivity and specificity: percent of state population residing in the jurisdiction of an agency that participates in Fusion center.

Incident & Information Management

Emergency Public Information & Warning

Degree to which a state has a public information and communication plan developed for a mass prophylaxis campaign

ID	M64	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the development of a framework for effective and timely public health risk communications during an emergency in which medical countermeasures are to be dispensed to the public.

Limitations of Measure

The measure only accounts for pre-event planning during a mass dispensing scenario and does not account for planning towards broader emergency scenarios. In addition, the measures does not account for emergent, response-driven public information and risk communication strategies or the implementation of previously developed frameworks.

Use of Measure

The measure is a proxy for measuring the quality of a public information and risk communications framework for implementation during a public health emergency. This measure should be used with other measures in the Emergency Public Information and Warning sub-domain to help describe the state's capability.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Score (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure due to low construct validity from multi-trait scale analysis and internal consistency reliability tests. Plan may not be accurate proxy measure for capability. Measure has not been validated by prior studies.

Incident & Information Management

Emergency Public Information & Warning

Percentage of geographic area covered by enhanced 911 per state [0=0, 1=1–50%, 2=51–75%, 3=>75%]

ID	M115	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

Measuring the percentage of the state's geographic service area covered by enhanced 911 describes the ability to identify the caller's location when using a landline phone and can assist in developing situational awareness (e.g., when a volume of calls from a similar location report similar information). The system is important with regards to the exchange of public health and medical-related information with the public in a routine emergency.

Limitations of Measure

The measure does not take into account that enhanced 911 features do not work with cell phones. In addition, the measure is limited in terms of its ability to generalize about disseminating emergency information and warning to the public as it is primarily a mechanism to receive information.

Use of Measure

The measure is a proxy for information exchange between responders and the general public.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Predefined choice

Data Normalization Number of options out of 3; 0=0, 1=1–50%, 2=51–75%, 3=> 75%

Recommendation: Retain and modify measure pending availability of updated data source from FCC. Specify measure for improved sensitivity and specificity: percentage of population residing in service areas with enhanced 911 service.

Incident & Information Management

Emergency Public Information & Warning

Percentage of geographic area covered by wireless 911 per state from at least one carrier [0=0, 1=1–50%, 2=51–80%, 3=81–99%, 4=100%]

ID	M116	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

The measure focuses on percentage of a state's geographic service area that is covered by wireless 911. Wireless service providers that provide a Public Safety Answering Point with the telephone number of the originator of a wireless 911 call and the location of the cell site or base station transmitting the call increases the ability to identify the location of an individual caller that is experiencing an emergency. Households are increasingly abandoning landline telephone service and are converting to cellular telephone use.

Limitations of Measure

The measure is limited in terms of its ability to generalize about disseminating emergency information and warning to the public as it is primarily a mechanism to receive information.

Use of Measure

The measure is a proxy for the establishment of modernized, enhanced 911 service using cell site or base station location.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Predefined choice

Data Normalization Number of options out of 4; 0=0%, 1=1–50%, 2=51–80%, 3=81–99%, 4=100%

Recommendation: Retain and modify measure pending availability of updated data source from FCC. Specify measure for improved sensitivity and specificity: percentage of population residing in service areas with enhanced 911 service.

Incident & Information Management

Emergency Public Information & Warning

{Percentage of} Epidemic Information Exchange (Epi-X) users {who} responded to a system-wide notification test within three hours

ID	MI18	Type	Process
Measure last updated	2010	Obtained for the Index	Feb-13

Rationale for Measure

Measuring the timeliness of state response to Epidemic Information Exchange (Epi-X) notifications demonstrates the ability of state and local health departments, as well as other public health professionals, to access and share preliminary health surveillance information securely and quickly.

Limitations of Measure

The measure does not account for receiving emergency public information through other sources, nor for other means to verify end-user receipt.

Use of Measure

The measure indicates the ability to acknowledge electronic public health epidemiological alerts and surveillance information in a timely fashion.

Data Source

Centers for Disease Control and Prevention (CDC). The Epidemic Information Exchange (Epi-X) Program. 2010. Additional details about this measure are available from the source. Data are collected by the CDC's Epi-X program and are published in CDC's 2010 report *Public Health Preparedness: Strengthening the Nation's Emergency Response State by State*, Section 2.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Measure may reflect a low performance threshold that is easily met or exceeded in all states, therefore its inclusion in the Index diminishes Index sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index. Updated data availability within 3 year periodicity cycle is not confirmed.

Incident & Information Management

Emergency Public Information & Warning

{Proportion of} households with residential fixed connections (approximating the national broadband availability target)

ID	M228	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jun-14

Rationale for Measure

The measure is focused on the availability of residential infrastructure that provides fixed internet connections. The measure assesses the households per state that maintain residential fixed connections.

Limitations of Measure

The measure itself only focuses on fixed connections and in the health security context therefore relies upon the assumption that during a public health emergency transmission towers will remain operational. In addition, one state's data are withheld due to maintenance of confidentiality.

Use of Measure

The measure is a proxy for measuring the public's ability to access public information and risk communications messages that are disseminated via internet technology.

Data Source

Federal Communications Commission (FCC). *Internet Access Service: Status as of June 30, 2012*. 2013 (2012 data). Additional details about this measure are available from the source. Report published by the FCC Industry Analysis and Technology Division, Wireline Competition Bureau. This report is updated biannually for the 50 states, the District of Columbia, American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands.

Target Setting

Statistically calculated

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Data Type Quantitative

Data Integration Proportion (0–1)

Data Normalization State score divided by target

Incident & Information Management

Emergency Public Information & Warning

{State public health agency} issued initial risk communication to the public during a real or simulated emergency

ID	M332	Type	Process
Measure last updated	2014 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

This performance indicator demonstrates the state public health agency's ability to develop, coordinate, and disseminate the first risk communication message to the public during a public health emergency. In addition, it is critical that the public is made aware of the incident and instructed about necessary actions in a timely manner and from a credible source.

Limitations of Measure

The measure does not address the quality of the risk communication. Furthermore, the measure only takes into consideration the initial communication, not the effectiveness of the overall risk communication public messaging campaign that occurs throughout an incident.

Use of Measure

The measure is an indicator of the ability to issue an initial risk communication to the public in an emergency.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). *2013–2014 National Snapshot of Public Health Preparedness*. 2014 (2011–2012 data). Additional details about this measure are available from the source. Data are compiled by CDC OPHPR's Division of State and Local Readiness (DSLRL).

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Measure may reflect a low performance threshold that is easily met or exceeded in all states, therefore its inclusion in the Index diminishes Index sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index. Updated data availability within 3 year periodicity cycle is not confirmed.

Incident & Information Management

Legal & Administrative

{State has} agreements {formal written agreements, informal agreements, some formal and informal} to share services or function with other states

ID	M337	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The ability to have agreements in place for shared services during an emergency is important to ensure core services and functions can be continued.

Limitations of Measure

The measure does not specify what types of agreements are in place for shared services, or which shared services the agreement covers. The measure does not evaluate if the agreements have ever been used or exercised.

Use of Measure

The measure can be used to indicate if a jurisdiction has established agreements with other states to provide shared services. Shared services may be routine or during an emergency.

Data Source

Association of State and Territorial Health Officials (ASTHO). *2012 ASTHO State Profile Survey*. 2012. Accessed from the 2012 ASTHO State Profile Survey. The survey is issued every few years to health agencies in the states, U.S. Territories, and the District of Columbia. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspl.org.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Measure is lacking in specificity and subject to wide variation in interpretation. Updated data availability within 3 year periodicity cycle is not confirmed.

Incident & Information Management

Legal & Administrative

State requires facility reporting of healthcare-associated infections to the Centers for Disease Control and Prevention's (CDC's) National Health Safety Network (NHSN) or other systems

ID	M338	Type	Process
Measure last updated	2014 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Healthcare-associated infections are a major, yet preventable, threat to patient safety. The National Health Safety Network (NHSN) is the CDC's system to collect surveillance data on these infections and to provide prevention strategies to healthcare facilities and providers.

Limitations of Measure

The measure evaluates whether healthcare facilities are required to report healthcare associated infections to the NHSN. The measure does not evaluate the healthcare facilities' compliance with the reporting requirements.

Use of Measure

The measure can be used as an indicator of baseline hospital and institution infection control measures before an emergency, as well as an indicator of the state's ability to require healthcare facilities to report healthcare-associated infections to the CDC. The measure and other measures in the Legal & Administrative sub-domain provide an indication of a state's legal and regulatory capability.

Data Source

Centers for Disease Control and Prevention (CDC). National Healthcare Safety Network (NHSN). *Healthcare-Associated Infections (HAI) Progress Report*. 2014 (2012 data). Additional details about this measure are available from the source. Data were collected through NHSN. All 50 states participate in NHSN.

Target Setting

Subject matter expert opinion

Recommendation: Modify location of measure in the Index due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Measure performs better as an indicator of surveillance capability.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Incident & Information Management

Legal & Administrative

{The state's Public Health Emergency Preparedness (PHEP) Cooperative Agreement Awardees} implemented all or part of the administrative preparedness (AP) plan in budget period (BP) I

ID	M339	Type	Process
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

States need to be prepared to rapidly accept, manage, and distribute federal supplemental funding in response to emergent health security events, such as the H1N1 influenza pandemic. Being able to rapidly and efficiently accept funding, and target that funding to prepare for and respond to an emerging health threat, has proven to be an important public health preparedness capability.

Limitations of Measure

The measure only assesses the capability of the state to implement all or part of an administrative preparedness plan, not necessarily the complete administrative preparedness plan. The quality and feasibility of the plan are not measured.

Use of Measure

This measure is an indicator of a state's ability to plan for and at least partially implement an administrative preparedness plan. This measure should be viewed with other measures in the Legal & Administrative sub-domain to assess the ability of the state's public health system to ensure efficient acquisition of resources and use emergency funds in response to a health security event.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). *Analysis of BP1 Administrative Preparedness Requirements for PHEP Awardees*. 2013. Additional details about this measure are available from the source. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspl.org.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Measure may reflect a low performance threshold that is easily met or exceeded in all or most states, therefore its inclusion in the Index diminishes Index sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index. Updated data availability within 3 year periodicity cycle is not confirmed.

Incident & Information Management

Legal & Administrative

Who must report foodborne illness within the state? {Number out of the following reporting source types}: clinical laboratories, physicians, hospitals, nurses, physician assistants, and/or other healthcare providers (e.g., chiropractors, veterinarians)?

ID	M340	Type	Process
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the types of reporting sources from which health departments receive required reports of foodborne illness. Rapid identification and reporting of foodborne disease is vital to the success of public health interventions that can limit the spread of disease. It is important to assure reporting requirements reflect the widening scope of health care providers being used.

Limitations of Measure

The measure is limited to if the state has a specific law that requires foodborne illnesses or related conditions be reported by these providers. The measure does not evaluate the completeness or timeliness of the disease reporting.

Use of Measure

The measure can be used to determine if a state has a legal basis for a system of rapid reporting of foodborne illnesses from a variety of reporting sources. This measure should be viewed with other measures in the Legal & Administrative sub-domain to gain a better understanding of the adequacy of state laws supporting health preparedness.

Data Source

Public Health Law Research (PHLR). Temple University. Robert Wood Johnson Foundation (RWJF). *LawAtlas: State Foodborne Illness Reporting Laws Map*. 2013. Additional details about this measure are available from the source. Data include laws reported through April 2013.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Predefined choice

Data Normalization Number of reporting source types out of six

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually. Pending availability of updated data within 3 year periodicity cycle.

Incident & Information Management

Legal & Administrative

State law include{s} a general provision regulating the release of personally identifiable information (PII) held by the health department

ID	M341	Type	Process
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

States with laws authorizing the release of PII without patient consent for purposes of responding to communicable diseases are able to more quickly implement effective response strategies to slow and stop the spread of disease. These laws include such information as to whom personally identifiable information may be released and the specific rationale or purpose for which such may be done.

Limitations of Measure

The measure only assesses whether or not a law is in place. It does not capture the scope of the authorization. It does not measure the infrastructure in place to implement investigation, control, and other response strategies.

Use of Measure

The measure is a proxy for how quickly states may be able to implement measures to control the spread of infectious diseases. It should be used in conjunction with Health Security Surveillance & Epidemiologic Investigation measures to build a picture of a state's ability to identify communicable diseases.

Data Source

Public Health Law Research (PHLR). Temple University. Robert Wood Johnson Foundation (RWJF). *LawAtlas: Public Health Departments and State Patient Confidentiality Laws Map*. 2013. Additional details about this measure are available from the source. Data include laws reported through August 2013.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=1

Recommendation: Exclude measure due to lack of variation across states. Measure reflects a low performance threshold that is easily met or exceeded in all states, therefore its inclusion in the Index diminishes Index sensitivity and specificity. Measure is also redundant with federal HIPAA regulations that cover all states. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index. Updated data availability within 3 year periodicity cycle is not confirmed.

Incident & Information Management

Legal & Administrative

State law requires communicable diseases to be reported to a health department

ID	M342	Type	Process
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

Prompt reporting of communicable diseases to the state or local health department is crucial to the control and prevention of disease outbreaks. State and local public health system disease surveillance and control activities are the backbone of the nation's ability to control the spread of communicable diseases.

Limitations of Measure

The measure only evaluates whether a state requires communicable disease reporting to state or local health officials. The measure does not evaluate the timeliness or completeness of the required reporting, nor how effective the state is in monitoring and enforcing the requirements. It does not evaluate the ability of the health department to receive and use the reported information.

Use of Measure

The measure is one indicator that the state has the legal authority to require sharing of information needed for public health interventions to control communicable diseases. This measure, taken with other measures in the Legal & Administrative sub-domain, provides information to evaluate the capability of the state's legal system to support needed actions during a health emergency.

Data Source

Public Health Law Research (PHLR). Temple University. Robert Wood Johnson Foundation (RWJF). *LawAtlas: Communicable Disease Intervention Protocol Map*. 2013. Additional details about this measure are available from the source. Data include laws reported through July 2013.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to lack of variation across states. Measure reflects a low performance threshold that is easily met or exceeded in all states, therefore its inclusion in the Index diminishes Index sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index. Updated data availability within 3 year periodicity cycle is not confirmed.

Incident & Information Management

Legal & Administrative

{Average number of} legal protections {liability, workers' compensation, malpractice} provided for Medical Reserve Corps volunteers {per unit in the state}

ID	M343	Type	Process
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

Volunteers are essential to a response during declared emergencies. Volunteers must have adequate legal protections in order to perform during a declared emergency, training activities, routine and special events outside an emergency declaration, and when assigned outside of their jurisdiction.

Limitations of Measure

The measure does not describe the type of “legal protection” being provided. The measure only describes legal protections given to Medical Reserve Corps (MRC) units. States may have medical and healthcare volunteer programs that do not participate in the national MRC program.

Use of Measure

The measure should be used to understand the legal protections afforded MRC units in a given state. The measure should be used with other measures in the Legal & Administrative sub-domain to better understand the legal protections offered to volunteers.

Data Source

National Association of County and City Health Officials (NACCHO). *Stronger Together: A National Network of Volunteers*. 2013. Additional details about this measure are available from the source. NACCHO collected data by a web survey emailed to every active MRC unit leader or designated alternate.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Average number of protections per
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Updated data availability within 3 year periodicity cycle is not confirmed.

Incident & Information Management

Legal & Administrative

State has adopted the Nurse Licensure Compact (NLC)

ID	M344	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

The Nurse Licensure Compact allows licensed nurses residing in participating states the ability to practice in other participating states without applying for a new license. In the event of a significant disaster, Nurse Licensure Compact member states do not face licensing barriers when incorporating licensed nursing staff from other Nurse Licensure Compact member states into medical surge responses. States not party to this compact face increased administrative barriers when incorporating licensed nurses from other states into responses.

Limitations of Measure

The measure covers only the reduced administrative burden states gain from membership in the Nurse Licensure Compact. It does not measure individual state capacity to incorporate out-of-state nurses into medical surge responses. Additionally, some states may have existing agreements in place, similar to but smaller in scope, than the Nurse Licensure Compact.

Use of Measure

In conjunction with other Legal & Administrative sub-domain measures, this measure helps assess the steps states have taken to reduce legal and administrative barriers to in the event of an emergency.

Data Source

National Council of State Boards of Nursing (NCSBN). *Nurse Licensure Compact (NLC) Member States*. 2014. Additional details about this measure are available from the source. NCSBN maintains a list of member states.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Incident & Information Management

Legal & Administrative

State has adopted Emergency Management Assistance Compact (EMAC) legislation

ID	M345	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

The Emergency Management Assistance Compact (EMAC) establishes a legislative and legal foundation for interstate assistance in the event of a governor-declared emergency. This foundation settles issues of liability, responsibility, licensing, and credentialing prior to an emergency. This prior arrangement allows impacted states a more efficient means of identifying and securing assistance following an emergency.

Limitations of Measure

All states are signatory to the EMAC; therefore, this score cannot be improved.

Use of Measure

In conjunction with other Legal and Administrative measures, this measure helps assess the steps states have taken to reduce legal and administrative barriers in the event of an emergency.

Data Source

National Emergency Management Association (NEMA). *What is EMAC?* 2014. Additional details about this measure are available from the source. EMAC tracks states and territories that have enacted legislation to become EMAC members.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to lack of variation across states. Measure reflects a low performance threshold that is easily met or exceeded in all states, therefore its inclusion in the Index diminishes Index sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Healthcare Delivery

Prehospital Care

State renewal requirement {in years} for emergency medical technician (EMT) basic credentials

ID	M81	Type	Process
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

Emergency medical technicians-basic (EMT-Bs) provide important clinical care services in the prehospital setting. They routinely provide basic life support to protect respiratory airways, breathing, and circulation in care of trauma and medical patients. EMT-Bs also assist in rapid assessment and triage of patients in mass casualty incidents. Renewal of credentials ensures that EMT-Bs remain current in their knowledge and skill sets related to the provision of basic life support care. Relatively more frequent renewal requirements may contribute to higher levels of core competencies in this area.

Limitations of Measure

Although a renewal requirement may be important to ensure the retention of skill sets and core competencies, actual compliance rates with the requirement may be low. In addition, relatively frequent renewal requirements (e.g., every year or two) may not lead to a more knowledgeable or skillful prehospital/medical first responder workforce. Moreover, EMT-Bs are only one, though important, component of the prehospital/medical first responder workforce. Finally, EMT-Bs are trained in important, but relatively simple techniques, which may assist in lower acuity cases but may not be sufficient for higher acuity ones such as for CBRNE incidents.

Use of Measure

The measure, in combination with other process and capacity measures, can be used to describe the degree to which the prehospital clinical workforce (i.e., medical first responders) are current in core competencies related to basic and advanced life support. Such competencies are deemed critical to support a response to a mass casualty event, public health emergency, or other health security concern.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Predefined choice

Data Normalization Years: 5=0, 4=.25, 3=.5, 2=.75, 1=1

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

State renewal requirement {in years} for emergency medical technician (EMT) paramedic credentials

ID	M82	Type	Process
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

Emergency medical technicians-paramedic (EMT-Ps) provide important clinical care services in the prehospital setting. They routinely provide advanced life support services, including invasive medical procedures, to support respiratory function, control cardiac arrhythmias, and stop severe hemorrhaging for all manner of traumatic injuries and severe medical illnesses. EMT-Ps also provide rapid assessment and triage of patients in mass casualty incidents. Renewal of credentials ensures that EMT-Ps remain current in their knowledge and skill sets related to the provision of life support care. Relatively more frequent renewal requirements may contribute to higher levels of core competencies in this area.

Limitations of Measure

Although a renewal requirement may be important to ensure the retention of skill sets and core competencies, actual compliance rates with the requirement may be low. In addition, relatively frequent renewal requirements (e.g., every year or two) may not lead to a more knowledgeable or skillful prehospital/medical first responder workforce. In addition, EMT-Ps are only one, though important, component of the prehospital/medical first responder workforce.

Use of Measure

The measure, in combination with other process and capacity measures, can be used to describe the degree to which the prehospital clinical workforce (i.e., medical first responders) are current in core competencies related to basic and advanced life support. Such competencies are deemed critical to support a response to a mass casualty event, public health emergency, or other health security concern.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Years: 5=0, 4=.25, 3=.5, 2=.75, 1=1

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

State {has an} emergency medical services (EMS) medical director

ID	M329	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Jul-14

Rationale for Measure

A recommendation of the *EMS Agenda for the Future* was for every state to have a state EMS medical director. This is extremely valuable since EMS prehospital care is changing due to new advances in prehospital research, equipment, supplies, and medications.

Limitations of Measure

The measure does not evaluate the competency of the EMS medical director. The measure does not evaluate whether the EMS medical protocols in a state are up-to-date or implemented at the local level.

Use of Measure

The measure should be used with other measures in the Prehospital Care sub-domain to help evaluate the status of a state's EMS program and the capacity of the state's EMS medical director to provide medical oversight of the EMS program.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

Does the state submit National EMS Information System (NEMIS) data to the national emergency medical services (EMS) database?

ID	M330	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

By submitting state emergency medical services (EMS) data to a national EMS database, states can ensure that the data can be utilized nationally for quality improvement and process development. This also facilitates the availability for the data to be used as a source for improving patient care and delivery of services at the prehospital level.

Limitations of Measure

Some states may have statewide or regional data collection systems that allow for state and local quality improvement and process improvement activities.

Use of Measure

The measure should be used with other measures in the Prehospital Care sub-domain to gain an indication of the strength of the state's EMS program.

Data Source

National Highway Traffic Safety Administration (NHTSA). *State NEMIS Progress Reports: State & Territory Version 2 Information*. 2014. Additional details about this measure are available from the source. Data are reported to NHTSA NEMIS.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Measure may have better construct validity as an indicator of surveillance capability. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

{State has} prehospital care emergency medical services (EMS)-specific protocols and triage guidelines {for} mass casualty

ID	M138	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

Measuring the existence of EMS-specific triage guidelines for a mass casualty incident is important in terms of a jurisdiction's ability to respond with predeveloped, standardized methods when a prehospital surge (i.e., ramp up) is needed to respond to a mass casualty event.

Limitations of Measure

The measure does not address the quality of EMS-specific mass casualty protocols or guidelines. The measure does not address how well the protocols and guidelines have been implemented in each state, or if the state has adequate EMS resources to respond to a mass casualty.

Use of Measure

The measure can be used to illustrate whether a jurisdiction has EMS-specific protocols and triage guidelines for a mass casualty event. In conjunction with other measures in the Prehospital Care sub-domain it is possible to get a snapshot of the pre-event planning for a mass casualty event by EMS providers in the jurisdiction.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

Does your state have a prehospital medical error reporting system where emergency medical services (EMS) (prehospital care) professionals can report (anonymously if they chose) errors associated with EMS service delivery or patient care?

ID	M139	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

Measuring the state's implementation of a prehospital medical error reporting system where medical errors experienced in EMS care can be anonymously submitted for performance improvement is important in improving the quality of care of routine patients as well as those patients impacted by an incident.

Limitations of Measure

The measure does not evaluate the completeness or frequency of reporting. The measure does not describe how the data from this system drives quality improvement.

Use of Measure

The measure is a proxy for medical error of prehospital care reporting during a disaster.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

{Number of} emergency medical technicians (EMTs) and paramedics {per 100,000 population}

ID	M140	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Measuring a state's workforce capacity with specific regard to emergency medical professionals such as emergency medical technicians (EMTs) and paramedics is important because this personnel resource is oftentimes the first responder in a public health emergency.

Limitations of Measure

The measure may not distinguish licensed EMTs and paramedics from those that are licensed, practicing, and affiliated.

Use of Measure

The measure gauges the state's workforce for the provision of prehospital medical care during a public health emergency. The measure used in combination with other measures in this sub-domain helps describe the ability of the state's emergency medical services (EMS) pre-event capacity to surge for an emergency.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Construct validity and reliability of measure have been established through prior studies. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

State's ability to monitor prehospital care emergency medical services (EMS) response time

ID	M156	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

The measure indicates the state's ability to monitor the time it takes for EMS support to arrive on-scene during routine service, which is likely an indicator of the state's readiness to respond to a public health emergency. A state EMS program's oversight of response time can also identify and correct issues delaying routine EMS response.

Limitations of Measure

The ability to monitor pre-event response time is important to this sub-domain, but by itself is not a predictor of the EMS system's ability to surge (i.e., ramp up) during an emergency.

Use of Measure

Monitoring prehospital care response time is an important capability for the state EMS agency to have, because it can drive a reduction in EMS response times. The measure is a proxy for assessing the capacity of an EMS response to an incident's location.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Construct validity and reliability has not been established through prior studies. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

State {has number of} prehospital care (EMS)-related specialty service capabilities

ID	M254	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Aug-13

Rationale for Measure

Sudden, acute disasters and other large scale emergencies such as earthquakes, tornadoes, and hurricanes—as well as transportation and mine accidents—may necessitate the need for specialized resources and assets that can locate, extricate, and provide initial medical stabilization to impacted individuals. States that possess such specialized training and assets as part of their organized EMS structure may be better able to assess a situation and provide such services in a timely manner.

Limitations of Measure

The measure does not distinguish between jurisdictions with substantial specialized resources and those with few resources, nor does it distinguish between types of specialized resources or levels of capability. In addition, possession of such capabilities within a jurisdiction may be less important than having access to such resources; for example, via a mutual aid agreement or memorandum of understanding with a neighboring jurisdiction. Finally, data are not available for four states.

Use of Measure

The measure can be used to illustrate whether a jurisdiction has any EMS-related specialty service resources and capability. In conjunction with other measures, it is possible to get a snapshot of the totality of specialized services available to EMS providers in the jurisdiction, as well as the ability of the jurisdiction to provide specialized first responder services and other forms of on-scene prehospital medical care.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of capabilities out of nine

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Construct validity and reliability has not been established through prior studies. Measure specification as a count variable creates inconsistencies in scaling. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

State prehospital care emergency medical services (EMS) office chemical, biological, radiological, and nuclear (CBRN) exercise participation

ID	M104	Type	Structure
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Feb-13

Rationale for Measure

The measure focuses on CBRN events which are a set of hazards of concern for national health security. Ensuring participation in CBRN disaster preparedness exercises will assist in the ability to manage a response to these types of events.

Limitations of Measure

The measure does not address multi-faceted organizational participation in actual responses in lieu of exercises. The measure also does not represent scenarios that may be more common or have greater risks for a jurisdiction (e.g., including natural/weather events). The measure only focuses on state EMS participation and no other aspects of the public health and healthcare system.

Use of Measure

The measure is a proxy for an EMS system's competency and knowledge required to manage a response to CBRN emergencies.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). *2011 National EMS Assessment*. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) *2011 EMS Industry Snapshot*, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Construct validity and reliability has not been established through prior studies. Updated data availability within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Prehospital Care

What percentage of the state's local emergency medical services (EMS) agencies submit National EMS Information System (NEMIS) compliant data to the state?

ID	M331	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

By submitting local or regional EMS data to a state EMS database, the data can be utilized for quality improvement and process development. This also facilitates the availability for the data to be used as a source for improving patient care and delivery of services at the prehospital level. A state will have increased capabilities to query the database and direct improvement processes.

Limitations of Measure

Some states may collect local and regional EMS data that provide some of the data in the national data set. These states may have the capability to conduct limited quality improvement and process improvement activities, but will be unable to compare themselves to national data.

Use of Measure

The measure is an indicator of the state's EMS program's ability to collect data needed for quality improvement and process improvement. This measure should be viewed with other measures in the Prehospital Care sub-domain to better understand a state's EMS agencies' capabilities.

Data Source

National Highway Traffic Safety Administration (NHTSA). *State NEMIS Progress Reports: State & Territory Version 2 Information*. 2014. Additional details about this measure are available from the source. Data are reported to NHTSA NEMIS.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Measure may have better construct validity as an indicator of surveillance capability. Updated data is available within 3 year periodicity cycle.

Healthcare Delivery

Inpatient Care

Median time {in minutes} from emergency department (ED) arrival to ED departure for admitted ED patients (identifier ED-1)

ID	M147	Type	Process
Measure last updated	2014	Obtained for the Index	May-14

Rationale for Measure

Measuring the time that patients spend admitted in the emergency department before being admitted to the hospital as an inpatient is important when managing medical surge (i.e., ramp up) and ensuring expeditious access to treatment during a public health emergency.

Limitations of Measure

There is unknown information about the nature of treatment between emergency department arrival and discharge.

Use of Measure

The measure provides information regarding the timeliness of patient movement from emergency department triage to facility admission. It is a pre-event measure of the capacity of a state's hospital-based emergency departments to move patients from the emergency department to inpatient care.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Timely and Effective Care—State*. 2014. Additional details about this measure are available from the source. Data are submitted by hospitals through the CMS Certification and Survey Provider Enhanced Reporting (CASPER) system.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Median time

Data Normalization State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Healthcare Delivery

Inpatient Care

Median admit decision time {in minutes} to emergency department (ED) departure time for admitted patients (identifier ED-2)

ID	M148	Type	Process
Measure last updated	2014	Obtained for the Index	May-14

Rationale for Measure

Measuring the time that patients spend in the emergency department after the physician decides to admit a patient and before the patient is admitted into the facility as an inpatient is critical to understanding the challenges that may be experienced in terms of medical surge (i.e., ramp up). Understanding the patient movement flow and barriers can assist in surge planning for public health emergencies to increase patients' access to treatment and supportive care.

Limitations of Measure

The measure describes the pre-event capability to move patients from the emergency department to inpatient care but it does not describe the hospital's capabilities during a mass casualty or other event.

Use of Measure

The measure is a proxy for measuring ability to admit patients in a timely manner and reduce medical surge bottlenecks.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Timely and Effective Care—State*. 2014. Additional details about this measure are available from the source. Data are submitted by hospitals through the CMS Certification and Survey Provider Enhanced Reporting (CASPER) system.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Median time

Data Normalization State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Healthcare Delivery

Inpatient Care

Number of staffed beds {per 100,000 population}

ID	M149	Type	Structure
Measure last updated	2014	Obtained for the Index	Sep-14

Rationale for Measure

The measure estimates the staffed bed capacity for general medical and surgical beds, as well as special care beds including intensive care units, coronary care units, and labor. The quantity of available, staffed beds per 100,000 population is an indicator of the healthcare system's ability to surge during a public health emergency.

Limitations of Measure

The measure does not include the total licensed beds for which a healthcare facility maintains a license to operate. The measure also does not consider plans for creating additional beds through hospital surge plans.

Use of Measure

The measure is a proxy for the pre-event medical infrastructure capacity to handle admitted patients.

Data Source

American Hospital Directory (AHD), Inc. *American Hospital Directory*. 2014. Additional details about this measure are available from the source. Data are available on the AHD website. Data on number of staffed beds are taken from the most recent Medicare cost report and updated as needed from AHD. Data are collected by AHD through the hospital's most recent Medicare cost report (W/S S-3, Part I, col.1).

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Construct validity and reliability of measure have been established through prior studies. Updated data availability annually.

Healthcare Delivery

Inpatient Care

Number of hospitals {per 100,000 population}

ID	M151	Type	Structure
Measure last updated	2014	Obtained for the Index	Sep-14

Rationale for Measure

The measure focuses on the capacity of the basic state medical infrastructure, measured by hospitals per 100,000 population.

Limitations of Measure

The measure does not incorporate the quality of care provided by the hospitals per 100,000 population, or the capacity of the hospitals (the number of beds available). This measure also does not indicate the quality of care provided by the hospitals.

Use of Measure

The measure provides a baseline of nonfederal, short-term, acute care hospitals within a community. Such facilities serve as the basic medical infrastructure in terms of current thinking on healthcare surge management. The measure should be viewed with other measures in the Inpatient Care sub-domain to gain an understanding of pre-event hospital capacity.

Data Source

American Hospital Directory (AHD), Inc. *American Hospital Directory*. 2014. Additional details about this measure are available from the source. Data are collected by AHD through three methods in lieu of one universal mechanism. The first method is direct communication with hospitals and has precedence over other sources. The second method is information collected or updated directly from a hospital or system website. Third, data are obtained from the most recent Medicare cost report and/or Medicare Provider of Services file (updated quarterly).

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Bed capacity measure (M149) is a more sensitive and specific measure of inpatient capacity.

Healthcare Delivery

Inpatient Care

Level I/II trauma center coverage—percentage of population, by state

ID	M152	Type	Structure
Measure last updated	2010 (2009 data)	Obtained for the Index	Oct-13

Rationale for Measure

The measure focuses on a state's medical infrastructure's ability to provide trauma care at a Level I or II designation according to population percentage. In general, trauma centers are regional resources essential to assist in the management and rehabilitation of patients with injuries from various types of emergencies and disasters. A Level I Trauma Center is capable of providing total care for a given injury. A Level II Trauma Center can initiate definitive care for all injured patients received.

Limitations of Measure

Trauma center categories vary state-by-state; however, common language is found on the American Trauma Society website. In addition, the quality of care provided by the trauma centers is not considered in this measure. Coverage for a particular state does not include coverage from neighboring states.

Use of Measure

The measure indicates the degree of regional infrastructure available pre-event to handle specific types of trauma patients in response to a disaster.

Data Source

American Trauma Society (ATS). TraumaMaps.org: Adult Level 1-2 Trauma Centers. 2010 (2009 data). Additional details about this measure are available from the source. Data on location and level of adult trauma centers are from the *2010 Trauma Information Exchange Program* (TIEP) inventory conducted by ATS and placed into trauma center maps by the University of Pennsylvania.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Modify measure to address poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests, and to accommodate an updated data source collected annually (CMS). For many households the closest trauma center lies across a state border, reducing the validity and reliability of this measure as currently constructed. Use an alternative specification: proportion of state's population who reside within 100 miles of a trauma center.

Healthcare Delivery

Inpatient Care

Level III trauma center coverage—percentage of land, by state

ID	M153	Type	Structure
Measure last updated	2010 (2009 data)	Obtained for the Index	Oct-13

Rationale for Measure

The measure focuses on a state's medical infrastructure's ability to provide trauma care at a Level I or II designation according to land percentage. Trauma centers are regional resources essential to assist in the management and rehabilitation of patients with injuries from various types of emergencies and disasters. A Level I Trauma Center is capable of providing total care for a given injury. A Level II Trauma Center can initiate definitive care for all injured patients received.

Limitations of Measure

Trauma center categories vary state-by-state; however, common language is found on the American Trauma Society website. In addition, the quality of the trauma centers is not included in this measure. Coverage for a particular state does not include coverage from neighboring states.

Use of Measure

The measure indicates the degree of regional infrastructure available to handle trauma patients requiring a Level I or II Trauma Center response to a disaster based on land dispersion.

Data Source

American Trauma Society (ATS). TraumaMaps.org: Adult Level 1-2 Trauma Centers. 2010 (2009 data). Additional details about this measure are available from the source. Data on location and level of adult trauma centers are from the *2010 Trauma Information Exchange Program* (TIEP) inventory conducted by ATS and placed into trauma center maps by the University of Pennsylvania.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests, Measure is duplicative of M153.

Healthcare Delivery

Inpatient Care

Correction: surgeons are also physicians

{Number of} physicians ~~and surgeons~~ {per 100,000 population}

ID	M160	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Physicians and surgeons are vital to providing care to people with serious injuries or illnesses associated with mass casualty events and disease outbreaks. The ability of the inpatient system to surge (i.e., ramp up) the number of these licensed professional to provide rapid care after an emergency event is important.

Limitations of Measure

This measure may not reflect that healthcare facilities and jurisdictions may have mutual aid plans in place to supplement the number of physicians and surgeons in the event of an emergency.

Use of Measure

The measure is a proxy for the licensed physician and surgeon workforce’s ability to surge following an emergency event. The measure should be viewed alongside other measures in the Inpatient Care sub-domain to indicate of the pre-event capacity of the inpatient system to surge following an emergency.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Retain measure due to adequate construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Construct validity and reliability of measure have been established through prior studies. Use a more timely data source to construct measure: AMA and AOA Physician Masterfile.

Healthcare Delivery

Inpatient Care

Number of active registered nurse (RN) and licensed practical nurse (LPN) licenses {per 100,000 population}

ID	M167	Type	Structure
Measure last updated	2014	Obtained for the Index	Jun-14

Rationale for Measure

Registered nurses (RNs) and licensed practical nurses (LPNs) are an important part of the medical workforce that provides medical care in the acute and primary care settings. An increased number of these actively practicing and licensed healthcare workers would be needed to respond to a mass casualty or emerging disease epidemic/pandemic. The measure focuses on the state's workforce capacity of current, active registered and practical nurses (PNs).

Limitations of Measure

The measure may underrepresent the number of RNs or LPNs available to surge to provide care during an emergency. States that do not participate in the National Council of State Boards of Nursing include Alaska, Hawaii, and Oklahoma. Louisiana does not report data regarding PNs. Further, mutual aid protocols may exist to bring additional RNs and PNs into the jurisdiction to respond to an emergency requiring medical surge.

Use of Measure

The measure includes both registered and practical nurses who are important in providing highly skilled care to people who need medical care after an emergency. The measure is an indicator of nurses who are actively practicing in each state. The measure should be viewed alongside other measures in the Inpatient Care sub-domain to indicate the pre-event capacity of the inpatient care sector to surge during an emergency.

Data Source

National Council of State Boards of Nursing (NCSBN). *National Nursing Database: Number of Active RN/PN Licenses by State*. 2014. Additional details about this measure are available from the source. Boards of nursing enter licensure and disciplinary data on a frequent basis. Of NCSBN's 58 member boards, 54 share licensure data.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Retain measure despite low construct validity as indicated by internal consistency reliability tests and multi-trait scaling analysis. Construct validity and reliability of measure have been established through prior studies, although the nurse workforce measure is not a specific indicator of inpatient capacity and also reflects outpatient and long-term care capacity. Data source is updated annually.

Healthcare Delivery

Inpatient Care

{Number of} burn beds {per 1 million population}

ID	M168	Type	Structure
Measure last updated	2014	Obtained for the Index	Oct-14

Rationale for Measure

Treatment of burns requires specialized resources and a highly trained multidisciplinary medical staff. This measure focuses on the capacity to provide a specialized medical infrastructure and medical staff capable of providing specialty burn care to trauma patients during a mass casualty incident.

Limitations of Measure

The measure may underrepresent the specialized resources needed for an emergency that requires mass care of burn patients. Burn beds may be available in neighboring states and may be located to rapidly surge burn treatment during an emergency. Some states have special burn treatment surge plans that provide skilled stabilization and the rapid transport of patients to burn beds available in other states.

Use of Measure

The measure describes a state's infrastructure for the treatment of burn patients. The measure should be viewed alongside other measures within the Inpatient Care sub-domain to indicate the state's pre-event specialized trauma infrastructure and medical services.

Data Source

American Burn Association (ABA). *Burn Care Facilities*. 2014. Additional details about this measure are available from the source. The measure continues to be collected.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per one million
Data Normalization	State score divided by target

Recommendation: Modify measure to address poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests, and to accommodate an updated data source collected annually (AHA). For many households the closest burn center lies across a state border, reducing the validity and reliability of this measure as currently constructed. Use an alternative specification: proportion of state's population who reside within 100 miles of a burn center.

Healthcare Delivery

Inpatient Care

{Number of verified} burn centers {per 1 million population}

ID	M169	Type	Structure
Measure last updated	2014	Obtained for the Index	Oct-14

Rationale for Measure

The treatment of burns requires specialized resources and a highly trained multidisciplinary medical staff. This measure focuses on the medical infrastructure and medical staff capable of providing specialty burn care to trauma patients.

Limitations of Measure

The measure provides the number of verified burn centers, which is a voluntary verification program, per 100,000 people within a state; it does not indicate the total number of burn treatment beds. It may underrepresent the number of resources available to treat burn patients. Burn centers may be available in neighboring states and may be contacted to rapidly surge burn treatments during an emergency. Some states may have special burn treatment surge plans that provide skilled stabilization and the rapid transportation of burn patients to burn centers in neighboring states. This source only includes verified burn centers and may not be all-inclusive of burn centers in a state.

Use of Measure

The measure describes a state's infrastructure for the treatment of burn patients. The measure should be viewed alongside other measures in the Inpatient Care sub-domain to indicate the state's capacity to provide appropriate care to burn patients and to surge treatment for burn patients during an emergency.

Data Source

American Burn Association (ABA). *Burn Care Facilities*. 2014. Additional details about this measure are available from the source. The measure continues to be collected.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per one million
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests, Measure is duplicative of M168.

Healthcare Delivery

Inpatient Care

{Total employed} number of emergency medicine privileged physicians {per 100,000 population}

ID	M294	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Emergency medicine physicians that have privileges to practice and admit patients in hospitals in the state are an important resource to providing treatment and care during a health emergency. This is an indicator that a state has a sufficient capacity to provide emergency medical care for its population in a disaster setting.

Limitations of Measure

The measure does not account for geographic distribution of providers within a state and does not account for access to emergency care.

Use of Measure

The measure gives an estimate of the relative abundance of medical providers in a state whose routine medical practice includes the delivery of emergency medical care so that the population's emergency medical needs can be met during a disaster.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspl.org.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Number per 100,000 population

Data Normalization State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests,

Healthcare Delivery

Inpatient Care

Number of acute long-term care beds {per 100,000 population}

ID	M295	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure reflects the number of licensed beds that serve long-term patients with complex medical care needs, including ventilator support.

Limitations of Measure

The measure does not reflect the number of vacant beds available and these facilities often are filled to capacity. The facilities would need permission from the licensing agency to take in patients over their capacity in the event of an emergency.

Use of Measure

In planning for a surge event, particularly one related to pandemic influenza where the post-infectious care needs often require extensive respiratory support, this measure should be viewed with other measures in the Inpatient Care sub-domain to better understand a state's long-term care capacity and capability.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspi.org.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Number per 100,000 population

Data Normalization State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Healthcare Delivery

Inpatient Care

{Percentage of} hospital facilities {in the state} that provide geriatric services

ID	M296	Type	Process
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Hospital-based geriatric care is an important inpatient service as the nation's population continues to age. Hospitals that provide geriatric care are better able to provide care and services to inpatient geriatric populations.

Limitations of Measure

The measure considers geriatric services that are owned or provided by the hospital or by the hospital's health system (i.e., doesn't require a contractual agreement). Hospitals may provide competent care to geriatric patients without having a specialty care program.

Use of Measure

The measure should be used with other measures in the Inpatient sub-domain to evaluate the level of specialty care provided by the state's hospital system.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspi.org.

Target Setting

Statistically calculated

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Healthcare Delivery

Inpatient Care

{Percentage of} hospital facilities {in the state} that provide palliative care programs

ID	M297	Type	Process
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Effective provision of palliative care is an important consideration in providing care during a disaster or health security event. Hospitals that have established palliative care programs as part of their hospital facilities services are more likely to be able to provide these services during an emergency and are more likely to have these services integrated with the hospital emergency plan.

Limitations of Measure

The measure only evaluates whether or not a hospital provides the service. The quality of care and the capacity of the program to provide services during an emergency are not considered.

Use of Measure

This measure should be viewed with other measures in the Inpatient Care sub-domain to evaluate the state's overall capacity and capability to respond to a health security event that requires the inpatient sector to participate.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspl.org.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Healthcare Delivery

Inpatient Care

Number of airborne infection isolation room (AIIR) beds {per 100,000 population}

ID	M298	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Airborne infection isolation rooms (AIIRs) are important to the treatment and care of patients that have diseases that are spread through airborne transmission. The measure provides information on hospital resources that can be used for emergency preparedness activities, including planning and response.

Limitations of Measure

The data source is primarily used to facilitate sales, planning, and marketing activities; it is not focused on preparedness. However, given that the report is produced annually by the American Hospital Association (AHA) and has been relied on by government agencies since 1946, any limitations of the measure do not outweigh its value.

Use of Measure

The number of AIIR beds per 100,000 population provides information on the capacity within a state to properly manage patients with diseases spread by airborne transmission. The measure is also an indicator of trained staff who have received specialty infection control training to work in these isolation rooms.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspi.org.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000 population
Data Normalization	State score divided by target

Recommendation: Modify measure to address poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. For many households the closest AIIR center lies across a state border, reducing the validity and reliability of this measure as currently constructed. Use an alternative specification: proportion of state's population who reside within 100 miles of a facility with AIIR.

Healthcare Delivery

Inpatient Care

Risk-adjusted 30-day mortality among Medicare beneficiaries hospitalized for heart attack, heart failure, or pneumonia

ID	M299	Type	Outcome
Measure last updated	2014 (2005–2011 data)	Obtained for the Index	Jul-14

Rationale for Measure

This measure is for risk-standardized all-cause 30-day mortality rates for Medicare patients aged 65 and older who are hospitalized with a principal diagnosis of heart attack, heart failure, or pneumonia. All-cause mortality is defined as death from any cause within 30 days after the index admission. This is a measure of the state's public health and healthcare system's programs, staffing, and requirements which influence recovery or mortality from an illness severe enough to require hospitalization.

Limitations of Measure

Variations in state populations (e.g., obesity or smoking rates) may have a greater effect on this measure than public health programs, mitigating the measure's use for this purpose.

Use of Measure

In combination with other measures, this measure indicates the relative strength of public health programs.

Data Source

The Commonwealth Fund. *Aiming Higher: Results from a Scorecard on State Health System Performance, 2014*. 2014 (2005–2011 data). Additional details about this measure are available from the source. The Commonwealth Fund analyzed Medicare enrollment and claims data dated July 2005 to June 2011 from the Centers for Medicare & Medicaid Services (CMS) Hospital Compare.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Rate expressed as percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. This measure is a validated clinical quality measure but has limited sensitivity and specificity as an indicator of preparedness domains.

Healthcare Delivery

Inpatient Care

Percentage of {grade} “A” hospitals {in a state} for Hospital Safety Score

ID	M300	Type	Structure
Measure last updated	2014 (2012–2014 data)	Obtained for the Index	Oct-14

Rationale for Measure

The Hospital Safety Score uses 28 national performance measures from the *Leapfrog Hospital Survey*, the Agency for Healthcare Research and Quality (AHRQ), the Centers for Disease Control and Prevention (CDC), and the Centers for Medicare and Medicaid Services (CMS) to produce a single score representing the hospital’s overall performance in keeping patients safe from preventable harm and medical errors. A grade “A” represents the best hospital safety score. Being able to provide patient safety and reduced medical errors during normal operations positions the hospital to perform better during health emergencies.

Limitations of Measure

More than 2,600 hospitals received a score. Hospitals excluded from receiving a score include critical access hospitals, specialty hospitals, pediatric hospitals, hospitals in Maryland, territories exempt from public reporting to CMS, and others.

Use of Measure

Patient safety is an important part of the overall quality provided by a hospital and includes the environment of care requirements that are part of emergency planning. This measure should be viewed with other measures in the Inpatient Care sub-domain to evaluate how well the state’s hospitals are prepared to respond to health security events.

Data Source

The Leapfrog Group. *Hospital Safety Score* (Health Security Surveillance). 2014 (2012–2014 data). Additional details about this measure are available from the source. The Health Security Surveillance uses national performance measures from the *Leapfrog Hospital Survey*, the Agency for Healthcare Research and Quality (AHRQ), the Centers for Disease Control and Prevention (CDC), and the Centers for Medicare and Medicaid Services (CMS).

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually. Modify measure to improve sensitivity and specificity by weighting the measure by hospital bed size, giving more weight to the safety scores of hospitals serving larger shares of the state population. To ensure updated data annually, restrict the measure to the AHRQ Patient Safety Indicators (PSIs), which have the strongest prior validity and reliability testing.

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} clinical, counseling, and school psychologists {per 100,000 population}

ID	M54	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

The measure focuses on state personnel capacity of clinical, counseling, and school psychologists to support behavioral and mental health services of children and other at-risk populations.

Limitations of Measure

The measure does not completely identify community resources needed to provide support to school age children and adolescents. It does not address mutual aid agreements that could increase the number of behavioral and mental health providers available during an emergency.

Use of Measure

The measure is a proxy for the behavioral and mental health workforce's ability to provide behavioral and mental health services to children following an emergency event.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} psychologists {per 100,000 population}

ID	M158	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Psychologists receive higher education and training to assess individuals' mental health and to treat people who experience mental illness. Following an emergency event, individuals, families, and disaster responders may experience distress and anxiety about safety, health, and recovery and may require mental health evaluation and treatment. The measure focuses on a state's workforce capacity to provide professional mental health services.

Limitations of Measure

Education and training for professionals in psychology varies considerably. Not all psychologists have specialized training or experience in disaster response, nor have all of them worked in shelters, where mental health services may be needed, nor have all of them engaged in outreach and educational activities in communities to facilitate the resiliency and recovery of survivors and responders. The measure does not indicate the total number of psychologists in a state or account for any mutual aid arrangements with neighboring states that could boost the number of psychologists available for disaster response.

Use of Measure

The measure is a proxy for the ability of a state's mental health workforce to surge during a public health disaster. It should be viewed alongside other measures in the Mental & Behavioral Healthcare sub-domain to indicate a state's ability, pre-event, to provide appropriate psychological services following a disaster.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests, Measure is duplicative of M54 above.

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Healthcare Delivery

Mental & Behavioral Healthcare

{Percentage of} hospital facilities {in the state} that provide chaplaincy/pastoral care services

ID	M315	Type	Process
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure provides information on the availability of chaplaincy/pastoral care services that are owned or provided by a hospital or by hospital's health system and not subject to contractual agreement.

Limitations of Measure

The data source is primarily used to facilitate sales, planning, and marketing activities; it is not focused on preparedness. When data are missing, estimates are generated from previous year's responses, so some information may be inaccurate. Chaplaincy/pastoral care services may not be available in adequate numbers to respond to a surge and services are not solely focused on fatalities. However, given that the report is produced annually by the American Hospital Association (AHA) and has been relied on by government agencies since 1946, the limitations of the measure do not outweigh its value.

Use of Measure

Chaplains/pastoral care staff may be instrumental in providing services to staff, patients, and their families when emergency events result in fatalities.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspi.org.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Healthcare Delivery

Mental & Behavioral Healthcare

{Percentage of} hospital facilities {in the state} that provide psychiatric emergency services

ID	M316	Type	Process
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

This measure indicates psychiatric services that are owned or provided by hospital or by a hospital's health system (i.e., don't require a contractual agreement). In times of disaster, psychiatric emergencies may occur and their prompt and efficacious treatment is important to a comprehensive behavioral health response. These emergency services may be treated in a number of settings, including hospitals. All hospitals are engaged in some level of disaster planning. If a hospital self-identifies as providing emergency psychiatric services, it is more likely that these services are coordinated/integrated with other disaster preparedness and response behavioral health efforts.

Limitations of Measure

Respondents to the American Hospital Association (AHA) survey (the source for this measure) may have varying definitions of emergency psychiatric services covering a broad range. In effect, all hospitals that provide emergency medical services provide emergency psychiatric services. At the same time, fewer may have more complete, specialty-staffed, comprehensive psychiatric emergency services. Positive responses to this measure will cover a very wide range of capability. A negative may reflect the complete absence of emergency psychiatric services or the respondent's view that a positive response requires a separate, identifiable, comprehensive service when, in fact, some capacity exists. The measure does not indicate the extent of the hospital's or emergency psychiatric services integration with other disaster preparedness and response efforts (including health). It does not measure the type of services provided such as at hospital, mobile crisis response capacity, telephone-based crisis services, etc. In some cases, this measure may tend to duplicate and/or overlap with another measure that asks about licensing and certification of behavioral health and substance abuse providers.

Use of Measure

The measure may serve as a very broad and potentially imprecise proxy measure of disaster behavioral health service availability. Care must be taken in over-interpreting the significance of this single measure based on the limitations provided. This measure should be viewed with other measures in the Mental & Behavioral Health sub-domain to assess the capability of the state to provide disaster mental and behavioral health during a health security event.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspi.org.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Healthcare Delivery

Mental & Behavioral Healthcare

Percent of need met in mental health professional shortage areas {in the state}

ID	M317	Type	Structure
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

It is reasonable to assume that if an area has existing shortages in key behavioral health personal, preparedness for and response to a disaster may not be as robust as in areas where there are not staff shortages. It might also be assumed that if there are shortages in mental health professionals, there may also be shortages in other specialty care professions, again indicating that overall disaster health and mental/behavioral health preparedness and response may be limited.

Limitations of Measure

This measure is based solely on the availability of psychiatrists. While psychiatrists often play an important role in the array of services provided following disasters, the vast majority of behavioral health services following disasters are provided by behavioral health professionals other than psychiatrists (e.g., psychologists, social workers, licensed counselors, pastoral counselors, psychiatric nurses). The extent to which this measure serves as a proxy for shortages in these other professional groups will likely vary across jurisdictions. The measure does not account for the ability of a state to temporarily move mental health resources within the state in times of disasters. For example, many states have established trained and certified crisis teams that can be activated and deployed to disaster zones, thus enabling rapid supplementation of local resources. The measure does not reflect the availability of existing resources (many providers have waiting lists and/or are legally and contractually obligated to serve particular populations and may not be available for alternative service in times of disasters). The measure does not reflect the status of skills and training necessary for optimal performance in disasters.

Use of Measure

This measure can be used as a proxy for the availability of behavioral health professionals who might be available to assist in disaster preparedness and response. Its use can be enhanced if combined with other similar data on additional behavioral health specialty providers and information about a state's ability to supplement resources in times of disaster.

Data Source

The Henry J. Kaiser Family Foundation. *Mental Health Care Health Professional Shortage Areas (HPSA)*. 2014. Additional details about this measure are available from the source. Data are compiled from the Health Resources and Services Administration (HRSA) Data Warehouse - Designated Health Professional Shortage Areas Statistics, as of April 28, 2014. The percent of need met is computed by dividing the number of psychiatrists available to serve the population of the area, group, or facility by the number of psychiatrists that would be necessary to eliminate the mental health HPSA (based on a ratio of 30,000 to 1 (20,000 to 1 where high needs are indicated).

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to adequate construct validity from multi-trait scale analysis and internal consistency reliability tests, and availability of updated data annually.

Healthcare Delivery

Mental & Behavioral Healthcare

Number of facilities whose primary focus is substance abuse treatment, mental health services, or a mix of substance abuse and mental health services {per 100,000 population}

ID	M318	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

A measure of these types of facilities per 100,000 population provides an indication of the relative existence/availability of behavioral health services within a jurisdiction. In addition, because these services are staffed by behavioral health professionals, it also becomes a secondary measure of the relative numbers of specially trained staff. The relative existence of these types of facilities therefore becomes a partial proxy for the availability of specialized mental health and substance abuse services during and following a disaster.

Limitations of Measure

Existence is not equal to availability in a crisis. This measure does not address the ability of such facilities to adapt their services to changing needs in the event of a disaster. For example, many of these types of facilities have waiting lists, and they all have legal obligations to serve existing consumers. The measure does not provide information regarding the extent of disaster preparation, readiness, or training. The measure does not identify the nature of ownership/administrative responsibility and it is not possible to measure what authorities may be necessary or in place to adapt their function in times of disaster. This type of population-based measure can result in distorted views of availability in jurisdictions with mixed or special characteristics (e.g., states that are largely rural with a few urban areas or jurisdictions with islands, mountain ranges, etc.). “Primary focus” facilities represent only a small portion of entities providing behavioral health services and therefore are not an accurate measure of the range of services and organizations in any given jurisdiction. The measure does not differentiate among the three types of facilities. As a result it is not possible to assess the availability of mental health services relative to substance abuse services. The measure does not differentiate among types of services provided that may be needed in disasters (such as inpatient, outpatient, residential, outreach, screening and assessment, etc.)

Use of Measure

As a proxy measure, this is useful only when considered with a larger set of measures that together may provide data on facilities and services (e.g., type, number, location, staff characteristics, administrative information, existence of disaster and emergency plans, integration with other services, and emergency preparedness and response authorities and efforts).

Healthcare Delivery

Mental & Behavioral Healthcare

Number of facilities whose primary focus is substance abuse treatment, mental health services, or a mix of substance abuse and mental health services {per 100,000 population}
(continued)

Data Source

Substance Abuse and Mental Health Services Administration (SAMHSA). *National Survey of Substance Abuse Treatment Services (N-SSATS): 2012 Data on Substance Abuse Treatment Facilities*. 2013 (2012 data). Additional details about this measure are available from the source. N-SSATS is used to collect data on the location, characteristics, and use of alcohol and drug abuse treatment facilities and services throughout the 50 states, the District of Columbia, and other U.S. jurisdictions.

Target Setting

Statistically calculated

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests,

Data Type

Quantitative

Data Integration

Number per 100,000 population

Data Normalization

State score divided by target

Healthcare Delivery

Mental & Behavioral Healthcare

**{Number of} residential (non-hospital) beds in substance abuse treatment and mental health facilities
{per 100,000 population}**

ID	M319	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

A measure of these types of facilities per 100,000 population provides an indication of the relative existence/availability of behavioral health services within a jurisdiction. In addition, because these services are staffed by behavioral health professionals, it also becomes a secondary measure of the relative numbers of specially trained staff. The relative existence of these types of facilities therefore becomes a very partial proxy for the availability of specialized mental health and substance abuse services during and following a disaster.

Limitations of Measure

Of the mental health and substance abuse service needs following disaster, residential services are among the least needed and utilized. Services such as counseling, short-term outpatient treatment, screening, assessment, education, and community and social supports are far more needed and utilized. In some disasters, rather than being considered potential assets for emerging needs, residential facilities present preparedness and response challenges, especially in terms of evacuation and critical services needed to serve existing patients/residents. Existence is not equal to availability in a crisis. This measure does not address the ability of such facilities to adapt their services to changing needs in the event of a disaster. For example, many of these types of facilities have waiting lists, and they all have legal obligations to serve existing consumers. The measure does not provide information regarding the extent of disaster preparation, readiness, or training. The measure does not identify the nature of ownership/administrative responsibility, and it is not possible to measure what authorities may be necessary or in place to adapt their function in times of disaster. This type of population-based measure can result in distorted views of availability in jurisdictions with mixed or special characteristics (e.g., states that are largely rural with a few urban areas or jurisdictions with islands, mountain ranges). In addition, residential facilities represent only a small portion of entities providing behavioral health services and therefore are not an accurate measure of the range of services and organizations in any given jurisdiction. This measure does not differentiate among the three types of facilities. As a result it is not possible to assess the availability of mental health services relative to substance abuse services. The measure does not differentiate among types of services provided that may be needed in disasters (such as inpatient, outpatient, residential, outreach, screening and assessment, etc.).

Use of Measure

This proxy measure is useful when considered in the context of a larger set of other measures that together may provide data on facilities and services (e.g., type, number, location, staff characteristics, administrative information, existence of disaster and emergency plans, integration with other services, and emergency preparedness and response authorities and efforts).

Healthcare Delivery

Mental & Behavioral Healthcare

**{Number of} residential (non-hospital) beds in substance abuse treatment and mental health facilities
{per 100,000 population}
(continued)**

Data Source

Substance Abuse and Mental Health Services Administration (SAMHSA). *National Survey of Substance Abuse Treatment Services (N-SSATS): 2012 Data on Substance Abuse Treatment Facilities*. 2013 (2012 data). Additional details about this measure are available from the source. N-SSATS is used to collect data on the location, characteristics, and use of alcohol and drug abuse treatment facilities and services throughout the 50 states, the District of Columbia, and other U.S. jurisdictions.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000 population
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Test a modified version of this measure that is the ratio of beds to patients served, providing a more sensitive and specific measure of slack treatment capacity.

Healthcare Delivery

Mental & Behavioral Healthcare

{Percentage of} licensed, certified, or accredited substance abuse/mental health facilities {in the state}

ID	M320	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Licensed, certified, and/or accredited facilities can serve as a measure of quality of services and facilities. Quality care, during disasters and in normal times, is dependent upon many factors including not only the existence of service providers but an assurance that the services meet quality criteria.

Limitations of Measure

The denominator of this measure is unclear. What is the measure a percentage of? The data source provides numerical data that is not expressed in percentages. The measure does not address the ability of facilities to adapt their services to changing needs in the event of a disaster. For example, many of these types of facilities have waiting lists, and they all have legal obligations to serve existing consumers. The measure does not provide information regarding the extent of disaster preparation, readiness, or training. It is likely that licensing, certification, and accrediting requirements regarding emergency preparedness and response are variable across various certifying bodies and across states. As a result, it becomes more difficult to compare findings.

Use of Measure

As it stands, this measure is a proxy measure for quality in the Mental & Behavioral Healthcare sub-domain. A lack of clarity regarding the denominator for the measure may result in varying reporting on this measure, thus limiting its utility. As a proxy measure, this is useful only when considered as a part of a large set of other proxy measures that together may provide data on facilities and services (e.g., type, number, location, staff characteristics, administrative information, existence of disaster and emergency plans, integration with other services, and emergency preparedness and response authorities and efforts). Those additional proxy measures were not in the list of measures provided.

Data Source

Substance Abuse and Mental Health Services Administration (SAMHSA). *National Survey of Substance Abuse Treatment Services (N-SSATS): 2012 Data on Substance Abuse Treatment Facilities*. 2013 (2012 data). Additional details about this measure are available from the source. N-SSATS is used to collect data on the location, characteristics, and use of alcohol and drug abuse treatment facilities and services throughout the 50 states, the District of Columbia, and other U.S. jurisdictions.

Target Setting

Statistically calculated

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests,

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} social workers and mental health and substance abuse social workers {per 100,000 population} (composite measure of M-41 and M-45)

ID	M348	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Social workers, and specifically mental health and substance abuse social workers, receive higher education and training to provide mental health services by empowering, advocating, and connecting affected populations to clinical and social services. Following an emergency event, individuals, families, and disaster responders may experience distress and anxiety about safety, health, and recovery and may require mental and behavioral health assistance, specifically calling on social workers' unique skills and training. The measure focuses on a state's workforce capacity to provide professional social worker services.

Limitations of Measure

Education and training for professionals in social work varies considerably. Further, not all social workers have specialized training or experience in disaster response. The measure does not account for any mutual aid arrangements with neighboring states that could boost the number of social workers available for disaster response.

Use of Measure

This measure is a composite of two measures (M41 and M45) and serves as a proxy for the ability of a state's mental health workforce to surge during a public health disaster. It should be viewed alongside other measures in the Mental & Behavioral Healthcare sub-domain to indicate a state's ability, pre-event, to provide appropriate psychological services following a disaster.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Measure M-348 is a composite measure of M-41 and M-45. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Composite
Data Integration	Average of two measures
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. As a more sensitive and specific alternative measure of surge capacity, use the measure of mental health professional participation in MRC (see volunteer subdomain).

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} mental health and substance abuse social workers {per 100,000 population}

ID	M41	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Social workers counted in the measure are educated and trained to assess and treat people with mental, emotional, or substance abuse problems, including alcohol, tobacco, and/or other drugs. During an emergency, a surge, or ramp up, of such specialists is needed to provide disaster behavioral health to large numbers of people. The measure focuses on the state's personnel capacity of mental health and substance abuse social workers to support mental health services.

Limitations of Measure

The measure may underrepresent the actual number of mental health and substance abuse social workers who can be available to surge during a disaster because it does not include mutual aid agreements with neighboring states that can send additional workers in this field. Also, the measure does not indicate the total number of mental health and substance abuse social workers in the state. Rather, it is a ratio of these workers per 100,000 people in the state. Not all mental health and substance of abuse social workers have been trained in or have delivered disaster behavioral health services (e.g., mental health, substance abuse, and stress management) to disaster survivors in shelters, acute, or inpatient settings. Although they may have experience working with individuals in crisis, the measure does not guarantee expertise during disasters.

Use of Measure

The measure is a proxy for the state's mental health workforce's ability to surge, or ramp up, following an emergency event. An assumption is that more personnel indicate a greater reserve of resources to surge. The measure should be viewed alongside other measures in the Mental & Behavioral Healthcare sub-domain to indicate the state's ability, pre-event, to provide appropriate social worker services in the event of a disaster.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. As a more sensitive and specific alternative measure of surge capacity, use the measure of mental health professional participation in MRC (see volunteer subdomain).

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} social workers {per 100,000 population}

ID	M45	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Social workers receive higher education and training to provide mental health services by empowering, advocating, and connecting affected populations to clinical and social services. Following an emergency event, individuals, families, and disaster responders may experience distress and anxiety about safety, health, and recovery and may require mental health assistance, specifically calling on social workers' unique skills and training. The measure focuses on a state's workforce capacity to provide professional social worker services.

Limitations of Measure

Education and training for professionals in social work varies considerably. Further, not all social workers have specialized training or experience in disaster response. The measure does not indicate the total number of social workers in a state or account for any mutual aid arrangements with neighboring states that could boost the number of social workers available for disaster response.

Use of Measure

The measure serves as a proxy for the ability of a state's mental health workforce to surge during a public health disaster. It should be viewed alongside other measures in the Mental & Behavioral Healthcare sub-domain to indicate a state's ability, prevent, to provide appropriate psychological services following a disaster.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. As a more sensitive and specific alternative measure of surge capacity, use the measure of social worker participation in MRC (see volunteer subdomain).

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} counselors and mental health counselors {per 100,000 population} (composite measure of M-42 and M-44)

ID	M347	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Counselors and mental health counselors work with individuals and groups to promote optimum mental and behavioral health and may focus on issues associated with addictions and substance abuse, family, parenting, marital problems, stress management, self-esteem, and aging. Following an emergency event, individuals, families, and disaster responders may experience distress and anxiety about safety, health, and recovery and may require mental and behavioral health evaluation and treatment.

Limitations of Measure

Education, training, and credentialing of counselors and mental health counselors vary widely. Not all mental health counselors and counselors have current, specialized training or experience in disaster response. The measure may under-represent the number of counselors and mental health counselors who could surge, or ramp up, in an emergency. It does not take into account mutual aid agreements a state may have with neighboring jurisdictions to rapidly provide additional mental and behavioral health resources.

Use of Measure

The measure is a composite of two measures (M42 and M44) and serves as a proxy for a state's mental health workforce's ability to surge following an emergency event. There is an assumption that more personnel indicates a greater reserve of resources to surge. It should be viewed alongside other measures in the Mental & Behavioral Healthcare sub-domain to indicate a state's ability, pre-event, to appropriately respond to the mental health needs of its population following a disaster.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Measure M-347 is a composite measure of M-42 and M-44. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Composite
Data Integration	Average of two measures
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. As a more sensitive and specific alternative measure of surge capacity, use the measure of mental health professional participation in MRC (see volunteer subdomain).

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} mental health counselors {per 100,000 population}

ID	M42	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Mental health counselors work with individuals and groups to promote optimum mental and emotional health and may focus on issues associated with addictions and substance abuse, family, parenting, marital problems, stress management, self-esteem, aging, etc. Following an emergency event, individuals, families, and disaster responders may experience distress and anxiety about safety, health, and recovery and may require mental health evaluation and treatment.

Limitations of Measure

Education, training, and credentialing of counselors vary widely. Not all mental health counselors have current, specialized training or experience in disaster response. The measure may underrepresent the number of mental health counselors who could surge, or ramp up, in an emergency. It is a ratio of the number of mental health counselors per 100,000 people in the state; therefore, it does not necessarily represent the total number of mental health counselors. It does not take into account mutual aid agreements a state may have with neighboring jurisdictions to rapidly provide additional mental health resources.

Use of Measure

This measure serves as a proxy for a state's mental health workforce's ability to surge following an emergency event. There is an assumption that more personnel indicate a greater reserve of resources to surge. It should be viewed alongside other measures in the Mental & Behavioral Healthcare sub-domain to indicate a state's ability, pre-event, to appropriately respond to the mental health needs of its population following a disaster.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. As a more sensitive and specific alternative measure of surge capacity, use the measure of mental health professional participation in MRC (see volunteer subdomain).

Healthcare Delivery

Mental & Behavioral Healthcare

{Number of} counselors {per 100,000 population}

ID	M44	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Counselors work with individuals and groups to promote optimum mental and emotional health and may focus on issues associated with addictions and substance abuse, family, parenting, marital problems, stress management, self-esteem, aging, etc. Following an emergency event, individuals, families, and disaster responders may experience distress and anxiety about safety, health, and recovery and may require mental health evaluation and treatment.

Limitations of Measure

Education, training, and credentialing of counselors vary widely. Not all counselors have current, specialized training or experience in disaster response. The measure may underrepresent the number of counselors who could surge during an emergency. It is a ratio of the number of counselors per 100,000 people in the state and does not indicate the total number of counselors. Also, it does not take into account mutual aid agreements a state may have with neighboring jurisdictions to rapidly provide additional mental health resources.

Use of Measure

The measure serves as a proxy for a state's mental health workforce's ability to surge following an emergency event. There is an assumption that more personnel indicate a greater reserve of resources to surge. It should be viewed alongside other measures in the Mental & Behavioral Healthcare sub-domain to indicate a state's ability, pre-event, to appropriately respond to the mental health needs of its population following a disaster.

Data Source

Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. As a more sensitive and specific alternative measure of surge capacity, test the measure of mental health professional participation in MRC (see volunteer subdomain).

Healthcare Delivery

Long-Term Care

{State requires that} long-term care and nursing home facilities must have a written disaster plan

ID	M303	Type	Process
Measure last updated	2014 (2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

Nursing home residents are considered vulnerable populations that have increased morbidity and mortality following a disaster. Disaster plans are essential to ensuring the population has an evacuation plan that is integrated with the local public health and emergency management community.

Limitations of Measure

The measure does not evaluate the quality or feasibility of the emergency preparedness plan. Simply having a plan is a not enough; it is the quality and detail of the plan and actively planning with the community that provides a deeper context.

Use of Measure

The measure provides an assessment of whether the facilities serving a vulnerable population have engaged in emergency preparedness planning. This measure should be viewed with other measures in the Long-Term Care sub-domain to gain an understanding of the state's long-term care facilities' emergency preparedness status.

Data Source

American College of Emergency Physicians (ACEP). *America's Emergency Care Environment, A State-by-State Report Card*. 2014 (2013 data). Additional details about this measure are available from the source. Data are compiled in the *ACEP State-by-State Survey of Disaster Preparedness Practices and Policies* (2013).

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Availability of updated data within 3 year periodicity cycle is not confirmed.

Healthcare Delivery

Long-Term Care

State is able to report the number of exercises with long-term care or nursing home facilities

ID	M304	Type	Process
Measure last updated	2014 (2013 data)	Obtained for the Index	Jul-14

Rationale for Measure

Nursing home residents are vulnerable populations that have increased morbidity and mortality in a disaster. Exercises provide an opportunity to assess evacuation planning for these communities and provide greater awareness of areas that need improving. The ability to report the number of long-term care facilities or nursing homes that have conducted emergency preparedness exercises indicates that the state values this preparedness activity and that the facilities report these events to the state.

Limitations of Measure

Exercises are essential in measuring disaster plans but it is the quality and type of the exercise (full scale vs. table top vs. limited simulation), the assessment of the exercise, and ultimately the feedback to the emergency preparedness plan for improvement that is most important. States may not be able to report the number of long-term care exercises, but the facilities may be conducting them.

Use of Measure

The measure provides an assessment of the state's engagement with long-term care facilities in tracking the number of emergency exercises that occur to improve disaster planning with this vulnerable population.

Data Source

American College of Emergency Physicians (ACEP). *America's Emergency Care Environment, A State-by-State Report Card*. 2014 (2013 data). Additional details about this measure are available from the source. Data are compiled in the ACEP *State-by-State Survey of Disaster Preparedness Practices and Policies* (2013).

Target Setting

Subject matter expert opinion

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Availability of updated data within 3 year periodicity cycle is not confirmed.

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Healthcare Delivery

Long-Term Care

{Number of} nursing facility beds in dedicated special care units (ventilator) {per 1,000 population aged 65 and older}

ID	M301	Type	Structure
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Nursing facilities that provide beds with ventilators are an indicator of where some of the most vulnerable (ventilator dependent) residents live. These facilities and their residents require special planning for evacuation. Access to ventilator beds will be required during health emergencies that result in respiratory illness and injury.

Limitations of Measure

The measure provides the number of ventilator beds in a state, but it provides no information on geographic distribution or location of ventilator beds, the types of ventilator used on the dedicated units, or whether ventilator beds are limited to adults over the age of 65 or include child/adolescent residents with disabilities or chronic conditions.

Use of Measure

Most healthcare organizations have a very limited capacity related to ventilator care. Knowing how many ventilator beds are available in the state is useful baseline information for proactive determination of contingency plans for providing service in-house or with partners, or triaging during patient surge to more appropriately resourced facilities.

Data Source

AHCA (American Health Care Association). *Long-Term Care Stats: Nursing Facility Characteristics Report*. 2014. Additional details about this measure are available from the source. Data are compiled from Centers for Medicare and Medicaid Services (CMS) Certification and Survey Provider Enhanced Reporting (CASPER) data.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 1,000 population aged 65 and older
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies suggest this measure is an indicator of vulnerability rather than capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

State average activities of daily living (ADL) dependence

ID	M302	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

This is a measure of the ability of long-term care patients to care for themselves. The rationale is more relevant in facilities with patients who are more able to care for themselves. There may be opportunity to triage such patients to homes or other care and release some existing healthcare capacity for use in disaster response.

Limitations of Measure

The measure makes assumptions about the ability of the state to manage triage and relocation of patients with higher levels of ability to care for themselves concurrent with a disaster. It also assumes that patient care staff in long-term care facilities have the skills, competencies, and licensure to meaningfully contribute to the disaster response.

Use of Measure

In combination with other measures in the Long-Term Care sub-domain and other Healthcare Delivery sub-domains, the measure can be used to indicate a state's capacity to divert resources during a disaster response.

Data Source

AHCA (American Health Care Association). *Long-Term Care Stats: Nursing Facility Patient Characteristics Report*. 2014. Additional details about this measure are available from the source. Data are compiled from Centers for Medicare and Medicaid Services (CMS) Certification and Survey Provider Enhanced Reporting (CASPER) data.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	State average
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies indicate that this measure (low acuity LTC utilization) is an indicator of nursing home sector inefficiency--e.g. over-supply of nursing home beds and/or under-supply of home and community based LTC services--rather than an indicator of preparedness capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

Number of skilled nursing care beds {per 100,000 population}

ID	M305	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Skilled nursing care beds are an important long-term care asset. These beds provide care to high-acuity residents. The measure also is a reflection of the state's skilled nursing and caregiver capacity.

Limitations of Measure

The measure only looks at the number of beds per 100,000 population. It is not a measure of the need for these beds or the average number of beds available during an emergency.

Use of Measure

The measure can be used to look at the overall capacity of skilled nursing beds in a state. The measure does not provide information on the number of beds that would be available during an emergency. This measure should be viewed with others in the Long-Term Care sub-domain to better understand a state's capacity and capability to respond to a health emergency. In a surge event, these beds could made be available to help decompress hospitals of stabilized patients.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspi.org.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000 population
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies indicate that this measure (SNF capacity) is an indicator of vulnerability shaped by market and regulatory characteristics (such as rigidity of CON enforcement and generosity of Medicaid payment rates) rather than an indicator of preparedness capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

Number of intermediate nursing care beds {per 100,000 population}

ID	M306	Type	Structure
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure reflects the number of long-term care-licensed facilities' certified beds that are available in a given state in proportion with the density of the total population. Intermediate care facilities serve people who need assistance and supervision. In most communities, there are people who are dependent for care that live in their own homes with a caregiver. These people often converge for care when there is a disruption to their setting.

Limitations of Measure

The measure only evaluates the number of beds; no bed demand or the number of beds available to be used during an emergency are evaluated. The facilities would need permission from the licensing agency to take in patients over their capacity in the event of an emergency.

Use of Measure

The measure can be used to understand the relative capacity of the state's long-term care system to provide residential care to moderate acuity residents. In a surge event, these settings could potentially help to decompress medically needs shelters or provide staff experienced in this level of care to help in a volunteer pool to staff these shelters.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspi.org.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000 population
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies indicate that this measure (SNF capacity) is an indicator of vulnerability shaped by market and regulatory characteristics (such as rigidity of CON enforcement and generosity of Medicaid payment rates) rather than an indicator of preparedness capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

{State average} reported registered nurse (RN) staffing hours per resident per day

ID	M308	Type	Structure
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Registered nurses (RNs) are important providers of skilled nursing care to residents. This measure is a reflection of core capacity for a clinical asset.

Limitations of Measure

The measure is an average that does not include more detail on the range/distribution, thus limiting its descriptive value. Data are collected during a specific two-week period; variations related to season, region, resident acuity, skill mix of other care providers, and other factors are not taken into account.

Use of Measure

The measure provides general baseline utilization data that can help guide surge and contingency planning. The measure should be viewed with other measures of skilled healthcare provider capacity in the Long-Term Care sub-domain.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Nursing Home State Averages*. 2014. Additional details about this measure are available from the source. CMS collected state averages of several nursing home quality measures.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	State average hours per resident per
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies indicate that this measure has high within-state variability, limiting its sensitivity and specificity as a measure of state capability. Studies also show this measure is an indicator of nursing home quality of care rather than preparedness capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

{State average} reported certified nursing assistant (CNA) staffing hours per resident per day

ID	M309	Type	Structure
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Certified nursing assistants (CNAs) provide important, non-nursing level care to residents and clients under their care. The average number of CNA staffing hours per resident per day is a reflection of core capacity and a measure of safety in terms of patient care.

Limitations of Measure

The CNA capacity in a state does not guarantee that they are available during a disaster. Those CNAs that are available also need to have disaster-specific education.

Use of Measure

The measure provides a general awareness of the density of this important healthcare professional workforce in a state's long-term care environment. It should be viewed with other measures in the Long-Term Care sub-domain to better understand the capacity of state's long-term care providers.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Nursing Home State Averages*. 2014. Additional details about this measure are available from the source. CMS collected state averages of several nursing home quality measures.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	State average hours per resident per
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies indicate that this measure has high within-state variability, limiting its sensitivity and specificity as a measure of state capability. Studies also show this measure is an indicator of nursing home quality of care rather than preparedness capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

Percent of long-stay residents assessed and appropriately given the seasonal influenza vaccine

ID	M307	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

This is a measure of the strength of the state's public health programs and general level of competency of long-stay resident facility managers as reflected in their effectiveness in risk avoidance through a seasonal vaccination program. It is also a measure of the population percentage who would have additional protection against seasonal flu, somewhat reducing the overall pressure on the healthcare system by mitigating the effect of seasonal flu during disaster response.

Limitations of Measure

The additional protection gained and the reduced demand on the healthcare system is of some value but may be marginal in the context of a major disaster. Also, the effectiveness of the vaccine varies as a function of the accuracy in predicting the strains used to make each year's vaccine.

Use of Measure

In combination with other measures, this measure reflects the public health program's effectiveness in administering necessary vaccinations, which is a measure of competency and staffing that could be applied to disaster response.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Nursing Home State Averages*. 2014. Additional details about this measure are available from the source. CMS collected state averages of several nursing home quality measures.

Target Setting

Statistically calculated

Recommendation: Retain measure despite poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Validity and reliability has been established through prior studies.

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Healthcare Delivery

Long-Term Care

{State average} reported licensed practical nurse (LPN) staffing hours per resident per day

ID	M310	Type	Structure
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Licensed practical nurses (LPNs) are important members of the resident care team, and provide skilled nursing care. This measure is a reflection of core capacity for a clinical asset.

Limitations of Measure

The measure is an average that does not include more detail on the range/distribution, thus limiting its descriptive value. Data are collected during a specific two-week period; variations related to season, region, resident acuity, skill mix of other care providers, and other factors are not taken into account.

Use of Measure

The measure provides general baseline utilization data that can help guide surge and contingency planning. The measure should be viewed with other measures of skilled healthcare provider capacity in the Long-Term Care sub-domain.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Nursing Home State Averages*. 2014. Additional details about this measure are available from the source. CMS collected state averages of several nursing home quality measures.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	State average hours per resident per day
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies indicate that this measure has high within-state variability, limiting its sensitivity and specificity as a measure of state capability. Studies also show this measure is an indicator of nursing home quality of care rather than preparedness capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

{State average} nursing home staffing turnover

ID	M311	Type	Structure
Measure last updated	2014 (2010 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure identifies the ratio of full- and part-time employee terminations that occurred during the year, regardless of cause, to the average number of active employees on the payroll during the same time period.

Limitations of Measure

The state average nursing home staffing turnover is not useful in determining health resiliency.

Use of Measure

The measure can be used as a quality indicator. Excessive turnover can decrease quality by disrupting continuity of care. The measure by itself is of limited usefulness in describing the capacity and capability of the state's long-term care system. This measure should be viewed with other measures in the Long-Term Care sub-domain to evaluate the health emergency preparedness capability of the long-term care system.

Data Source

AARP. The Commonwealth Fund. The SCAN Foundation. *Raising Expectations: A State Scorecard on Long-Term Services and Supports for Older Adults, People with Disabilities, and Family Caregivers*. 2014 (2010 data). Additional details about this measure are available from the source. Data are compiled in the American Health Care Association (AHCA) *Report of Findings: 2010 Nursing Facility Staffing Survey* (2011).

Target Setting

Statistically calculated

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Data Type Quantitative

Data Integration Ratio of employee terminations to average number of active employees

Data Normalization State score divided by target

Healthcare Delivery

Long-Term Care

{Percentage of} long-stay nursing home residents hospitalized within a six-month period

ID	M312	Type	Outcome
Measure last updated	2014 (2005–2011 data).	Obtained for the Index	Jul-14

Rationale for Measure

The measure indicates the percent of long-stay residents (residing in a nursing home for at least 90 consecutive days) who were hospitalized within six months of the baseline assessment.

Limitations of Measure

The measure may indicate the quality of service; nursing homes with a low percentage may serve as stronger coalition partners in planning and response. However, multiple factors affect hospitalization rates from a given nursing home; the measure does not distinguish among variables that might be relevant in emergency preparedness.

Use of Measure

The measure can be used as a quality indicator.

Data Source

The Commonwealth Fund. *Aiming Higher: Results from a Scorecard on State health System Performance, 2014*. 2014 (2010 data). Additional details about this measure are available from the source. The primary source is a Brown University analysis of 2010 Medicare enrollment data, Medicare Provider and Analysis Review File from the Centers for Medicare & Medicaid Services (CMS).

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies indicate that this measure has high within-state variability, limiting its sensitivity and specificity as a measure of state capability. Studies also show this measure is an indicator of nursing home quality of care rather than preparedness capability. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

Total number of certified nursing facility beds {per 1,000 population aged 65 and older}

ID	M313	Type	Structure
Measure last updated	2012 (2011–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Nursing home residents are among the most vulnerable populations impacted by emergencies. Whether an emergency is in the facility, community-wide, or regional, the fragility of many nursing facility patients requires that the assets that support them be identified, protected, and quickly deployed.

Limitations of Measure

The measure identifies the number of beds per 1,000 population aged 65–years-old or older, but the number does not address the availability of the beds.

Use of Measure

Knowledge of certified nursing facility beds could provide baseline information to support surge, contingency, and evacuation planning. This measure should be viewed with other measures in the Long-Term Care sub-domain to better understand the state's emergency preparedness capacity and capabilities in the long-term care environment.

Data Source

The Henry J. Kaiser Family Foundation. *Total Number of Certified Nursing Facility Beds*. 2012 (2011–2012 data). Additional details about this measure are available from the source. Data were obtained from the Kaiser Commission on Medicaid and the Uninsured analysis of the Centers for Medicare & Medicaid Services' (CMS) Online Survey, Certification, and Reporting (OSCAR) system data. The data reference period is January 2011 through February 2012.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 1,000 population aged
Data Normalization	State score divided by target

Recommendation: Exclude measure despite acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior research demonstrates that this measure, as an indicator of nursing home bed supply, is often associated with over-use of institutional LTC services and under-use of home and community based services (HCBS). Including it in the Index with a scaling that indicates "more is better" -- a higher bed supply contributes to higher preparedness scores -- conflicts with much prior research on the adverse effects of excess bed supply and with ongoing policy initiatives to reduce LTC beds in favor of HCBS. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Long-Term Care

Total number of special care beds in certified nursing facilities {per 1,000 population aged 65 and older}

ID	M314	Type	Structure
Measure last updated	2012 (2010 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure evaluates the number of beds available in dedicated special care units, which fall into the following categories: Alzheimer's, AIDS, hospice, rehabilitation, ventilator, and dialysis. Providing specialized care indicates that the nursing facility has equipment and specially trained staff to manage patients requiring additional medical care and treatment.

Limitations of Measure

Many nursing facilities offer care to Alzheimer's, AIDS, and hospice residents outside of special care units.

Use of Measure

The measure may be used as an indicator of a state's long-term care facilities' capability to provide higher level and specialized care to patients during a health emergency.

Data Source

The Henry J. Kaiser Family Foundation. *Total Number of Special Care Beds in Certified Nursing Facilities*. 2012 (2010 data). Additional details about this measure are available from the source. Data compiled from C. Harrington, H. Carrillo, M. Dowdell, P. Tang, and B. Blank; *Nursing, Facilities, Staffing, Residents, and Facility Deficiencies, 2005 Through 2010*; University of California, San Francisco, Department of Social and Behavioral Sciences, and the Centers for Medicare & Medicaid Services' (CMS) Online Survey, Certification, and Reporting (OSCAR) system data.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Number per 1,000 population aged 65 and older

Data Normalization State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Measure sensitivity and specificity may be improved by specifying the variable as a proportion of total nursing home beds rather than as a proportion of the older adult population.

Healthcare Delivery

Home Care

How often the home health team determined whether the patient received a flu shot for the current flu season {as an average percentage of home health episodes of care in the state}

ID	M291	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

Providing influenza vaccinations to vulnerable populations that are provided care through a home health agency is an indicator of the capability and quality of care provided by the agency.

Limitations of Measure

How often {average percentage of home health episodes of care in the state} the home health team determined whether the patient received a flu shot for the current flu season as an average percentage of home health episodes of care in the state is not in itself useful to determine population-level health resiliency.

Use of Measure

The measure should be used as an indicator of the capability and capacity of the state's home healthcare agencies to provide routine vaccinations to vulnerable populations. While this measure in itself does not determine health resiliency, it should be viewed with other measures in the Home Care sub-domain to evaluate a state's home care system's capacity and capability to respond to health security events.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Home Health Care-State by State Data*. 2014. Additional details about this measure are available from the source. CMS collected state averages of several home health agency quality measures.

Target Setting

Statistically calculated

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Data Type Quantitative

Data Integration Percentage (0–100)

Data Normalization State score divided by target

Healthcare Delivery

Home Care

How often the home health team began their patients' care in a timely manner {as an average percentage of home health episodes of care in the state}

ID	M292	Type	Outcome
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

The measure is an indicator of the capacity and effectiveness of the state's home care system to begin home care in a timely manner. Delays in providing home care can affect patient health and safety. The measure also indirectly looks at the hospital patient discharge system and its collaboration with home care providers.

Limitations of Measure

The measure is a statewide average and does not indicate the lengths of delays, nor does it identify if this is a regional or statewide problem. These issues limit the usefulness of the measure.

Use of Measure

The measure can be used as an overall indicator of the capacity of the state's home care system to provide care to discharged patients in a timely manner, consistent with their patients' care needs. This capacity is important during health emergencies, as hospitals will discharge lower acuity patients to make room for those with more life-threatening conditions.

Data Source

Centers for Medicare & Medicaid Services (CMS). *Home Health Care-State by State Data*. 2014. Additional details about this measure are available from the source. CMS collected state averages of several home health agency quality measures.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure due to poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior research demonstrates that this measure is an indicator of the quality of post-acute care and care transitions, rather than an indicator of preparedness capabilities in the home care setting. Including a measure of a construct that is different from the intended capability will cause Index composite scores to be misleading.

Healthcare Delivery

Home Care ←

Recommendation: Combine Long-Term Care and Home Care Subdomains into a single subdomain devoted to post-acute and long-term care.

{Number of} home health and personal care aides per 1,000 population aged 65 or older

ID	M293	Type	Structure
Measure last updated	2014 (2010–2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Home health and personal care aides provide important supportive care to those unable to live independently at home. These care providers are important to maintain the health and wellbeing of the clients under their care. During a health emergency, these providers may be crucial to implementing the emergency care plan for the home-based client.

Limitations of Measure

The number of home health and personal care aides per 1,000 population aged 65 and older gives an indication of the total capacity of home health aides available. However, that information in itself does not describe their availability during a health emergency or the number of providers that have emergency care plans for their clients.

Use of Measure

The measure by itself is of limited usefulness in describing the capacity and capability of the state's home care system. This measure should be viewed with other measures in the Home Care sub-domain to evaluate the health emergency preparedness capability of the home care system.

Data Source

AARP. The Commonwealth Fund. The SCAN Foundation. *Raising Expectations: A State Scorecard on Long-Term Services and Supports for Older Adults, People with Disabilities, and Family Caregivers*. 2014 (2010–2012 data). Additional details about this measure are available from the source. Data are compiled from the American Community Survey, U.S. Census Bureau.

Target Setting

Statistically calculated

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Data Type Quantitative

Data Integration Number per 1,000 population aged 65 and older

Data Normalization State score divided by target

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which state has developed a plan including Strategic National Stockpile (SNS) elements

ID	M60	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on a comprehensive, written plan essential to facilitate the receipt, distribution, and dispensing of Strategic National Stockpile (SNS) assets quickly and efficiently.

Limitations of Measure

The measure only considers the content and adequacy of a written plan and does not evaluate if the state has the resources and ability to implement the plan in a timely and effective manner.

Use of Measure

The measure is a proxy for the state's competency and knowledge in facilitating logistics for SNS assets during a public health emergency and should be used with other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain to evaluate pre-event capacity to receive, distribute, and dispense SNS assets

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Score (0–100)
Data Normalization	State score divided by target

Recommendation: Exclude measure from Index due to poor construct validity as indicated on internal consistency reliability tests and multi-trait scaling analysis. Measure has limited variation across states and reflects a low performance threshold that all or most states already meet, contributing to poor measure sensitivity and specificity. Consider current and future measures related to plan testing, implementation, and quality/comprehensiveness.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which a state has demonstrated ability to manage the Strategic National Stockpile (SNS), including updated staffing, call-down exercises, Incident Command System (ICS) integration, testing, and notification of volunteers

ID	M61	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on management, command-and-control, and coordination of Strategic National Stockpile (SNS) assets.

Limitations of Measure

The measure considers a roster and notification protocol for key staff and volunteers needed to implement the state's SNS plan. It does not measure the number of staff or volunteers that would actually be available during an emergency.

Use of Measure

The measure is a proxy for the state's competency and knowledge in facilitating logistics of SNS assets during a public health emergency and should be viewed in line with other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Score (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Level of completeness and utility of state plans and procedures in place for requesting Strategic National Stockpile (SNS) material from local authorities

ID	M62	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on plans for deciding how to deploy SNS assets, a collaborative effort among local, state, and federal officials to provide prophylaxis to the population within 48 hours.

Limitations of Measure

The measure considers the completeness of state plans to distribute SNS assets to local health departments but it does not measure if the state and local health departments have the capacity to implement the plan.

Use of Measure

The measure is a proxy for the state's competency and knowledge in facilitating logistics of SNS assets during a public health emergency and should be viewed in line with other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Score (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which a state has communications plans in place for Strategic National Stockpile (SNS) usage

ID	M63	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Each state has access to the country's Strategic National Stockpile (SNS) to supplement and resupply the state's own supply of life-saving medicines, vaccines, and equipment (materiel) when responding to a large-scale public health emergency. Part of a state's ability to receive, stage, coordinate, distribute, and keep track of these supplies depends on (1) timely and effective communications between people in disparate locations involved in moving and using supplies, and (2) devices and technology that can support such communication. This measure focuses on the availability and strength of the state's plan to communicate and coordinate tactics involving the SNS during an emergency.

Limitations of Measure

A limitation of the measure, which is a state-level score reported by the Centers for Disease Control and Prevention (CDC) after conducting technical assistance reviews with states, is that important variations in local readiness across the state may not be readily apparent. Additionally, the measure indicates the degree to which the state has completed a plan, but it does not address the quality of that the plan or whether it has been tested and improved.

Use of Measure

The bulk of on-the-ground work to transport and communicate about SNS supplies happens at the local level and depends on people and technology in many different places throughout the state.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Score (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which a state has completed security planning for coordination of medical countermeasures dispensing, management, and mass prophylaxis

ID	M65	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

When a public health emergency requires large numbers of people to receive pharmaceutical interventions, such as vaccine, antibiotics, or antivirals, a state must be able to safely provide supplies to the appropriate people and locations. The measure focuses on the degree to which the state has put in place a plan that makes the process secure and ensures the safety of the staff involved in receipt, distribution, and dispensing operations.

Limitations of Measure

The measure indicates the degree to which the state has completed a plan, but it does not address the quality of that the plan or whether it has been tested and improved.

Use of Measure

The measure is an indicator for security planning to protect personnel and medical countermeasures during distribution and dispensing in a public health emergency. The measure should be viewed alongside other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain to indicate how safely and effectively the state manages the procurement, management, and distribution of medical countermeasures.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Score (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which a state has demonstrated receipt, stage, and store (RSS) plans and procedures developed to coordinate all logistics concerning Strategic National Stockpile (SNS) materiel

ID	M66	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Each state has access to the country's SNS to supplement the state's own supply of life-saving medicines, vaccines, and equipment (materiel) when responding to a large-scale public health emergency. The size, location, and characteristics of the warehouse facilities involved affect the ability of the state to mount an effective emergency response. The measure focuses on the state's ability to receive, stage, and store medical countermeasures.

Limitations of Measure

The bulk of on-the-ground work to receive, stage, store, move, track, and keep secure SNS supplies happens at the local level and depends on people and technology in many different places throughout the state. A limitation of the measure, which is a state-level score reported by the Centers for Disease Control and Prevention (CDC) after conducting technical assistance reviews with states, is that important variations in local readiness across the state may not be readily apparent.

Use of Measure

The measure is a proxy for competency and knowledge in the state to receive, stage, and store medical countermeasures in public health emergency. The measure should be viewed alongside other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain as an indicator of the state's ability to acquire, maintain, transport, distribute, and track medical materiel (e.g., pharmaceuticals, gloves, masks, and ventilators) both before and during an incident, as well as to recover and account for unused medical materiel after an incident.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Score (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which state is observed to have a controlling inventory procedure in place, including an Inventory Management System (IMS) to track Strategic National Stockpile (SNS) materiel

ID	M67	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Each state has access to the country's SNS to supplement the state's own supply of life-saving medicines, vaccines, and equipment (materiel) when responding to a large-scale public health emergency. Each state needs clear procedures and an effective system to manage and track these critical, often limited supplies. The measure focuses on establishment within the state of a robust inventory management system to monitor the receipt of medical countermeasures, track their distribution, and record dispensing.

Limitations of Measure

The bulk of on-the-ground work to receive, stage, store, move, track, and keep secure SNS supplies happens at the local level and depends on people and technology in many different places throughout the state. A limitation of the measure, which is a state-level score reported by the Center for Disease Control and Prevention (CDC) after conducting technical assistance reviews with states, is that important variations in local readiness across the state may not be readily apparent.

Use of Measure

The measure is a proxy for a robust inventory management system to manage medical countermeasures during a public health emergency. The measure should be viewed alongside other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain as an indicator of the state's ability to acquire, maintain, transport, distribute, and track medical materiel (e.g., pharmaceuticals, gloves, masks, and ventilators) both before and during an incident, as well as to recover and account for unused medical materiel after an incident.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Score (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which state has a repackaging procedure in place, particularly for bulk medications for public dispensing

ID	M68	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Each state has access to the country's Strategic National Stockpile (SNS) to supplement the state's own supply of life-saving medicines, vaccines, and equipment (materiel) when responding to a large-scale public health emergency. The majority of oral medicines that come from the SNS are prepackaged. However, states may need to repackage bulk items in certain circumstances. The measure focuses on plans for repackaging bulk medications for public dispensing.

Limitations of Measure

The measure focuses on the completeness of a plan to repackage bulk medicines and does not measure the state's ability to implement the plan.

Use of Measure

The measure should be viewed alongside other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain as an indicator of the state's ability to acquire, maintain, transport, distribute, and track medical materiel (e.g., pharmaceuticals, gloves, masks, and ventilators) both before and during an incident, as well as to recover and account for unused medical materiel after an incident.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Score (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

Degree to which state has distribution plans and procedures in place for physical delivery of Strategic National Stockpile (SNS) assets from the receipt, stage, and store (RSS) facility to sites

ID	M69	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Each state has access to the country's SNS to supplement the state's own supply of life-saving medicines, vaccines, and equipment (materiel) when responding to a large-scale public health emergency. States are responsible for developing distribution networks that account for challenges and barriers unique to their areas. Clear communication is paramount between planners and facilities where countermeasures are received, staged, and stored. The measure focuses on the state's plan for physical delivery of SNS assets from the receipt, stage, and store (RSS) facility to dispensing sites, treatment centers, and regional distribution sites.

Limitations of Measure

The bulk of on-the-ground work to receive, stage, store, move, track, and keep secure SNS supplies happens at the local level and depends on people and technology in many different places throughout the state. Although the measure addresses the state's responsibility to tackle the cross-jurisdictional challenges and barriers, a limitation is that it is a state-level score reported by the Centers for Disease Control and Prevention (CDC) after conducting technical assistance reviews with states and important variations in local readiness across the state may not be readily apparent.

Use of Measure

The measure is proxy for competency and knowledge in a range of areas, from delivering to dispensing medical countermeasures, during a public health emergency. The measure should be viewed alongside other measures in the Medical Materiel Management, Distribution, & Dispensing sub-domain as an indicator of the state's ability to acquire, maintain, transport, distribute, and track medical materiel (e.g., pharmaceuticals, gloves, masks, and ventilators) both before and during an incident, as well as to recover and account for unused medical materiel after an incident.

Data Source

Centers for Disease Control and Prevention (CDC). Office of Public Health Preparedness and Response (OPHPR). Division of State and Local Readiness (DSLRL). 2012. Additional details about this measure are available from the source. Data were obtained directly from the source.

Target Setting

Statistically calculated

Data Type Quantitative

Data Integration Score (0–100)

Data Normalization State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

{Number of} pharmacists {per 100,000 population}

ID	M161	Type	Structure
Measure last updated	2013	Obtained for the Index	May-14

Rationale for Measure

Pharmacists are highly educated, trained, and licensed healthcare professionals who dispense prescription medications to patients and offer advice on their safe use in a range of settings, including retail drugs store, healthcare facilities, and academic research and training centers. They play a key and increasingly larger role in disaster-related countermeasure management and the dispensing of medicine. The measure focuses on state's workforce capacity of pharmacists.

Limitations of Measure

The measure may underrepresent the number of pharmacists available to respond during an emergency. The measure is a ratio of the number of pharmacists per 100,000 people in the state, not the total number. It does not account for any mutual aid arrangements with neighboring states that could boost the number of pharmacists available for disaster response.

Use of Measure

The measure is a proxy for the state's pharmacist workforce's ability to surge following an emergency event and capacity to dispense medications to a population affected by disaster.

Data Source

Bureau of Labor Statistics (BLS). Occupational Bureau of Labor Statistics (BLS). *Occupational Employment Statistics* (OES). 2013. Additional details about this measure are available from the source. OES wage and employment data have been collected in each state since 1996. The OES survey covers all full-time and part-time wage and salary workers in nonfarm industries. The survey does not cover self-employed owners, partners in unincorporated firms, household workers, or unpaid family workers.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Number per 100,000
Data Normalization	State score divided by target

Recommendation: Exclude measure from Index due to poor construct validity as indicated on internal consistency reliability tests and multi-trait scaling analysis. Consider replacing with a more sensitive and specific measure such as the number of pharmacists participating in MRC (see volunteer subdomain).

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

{Percentage of} hospital facilities {in the state that} participate in a group purchasing arrangement

ID	M270	Type	Process
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

Hospitals that participate in group purchasing can improve their effectiveness by attaining leverage with suppliers. This allows resources to concentrate on operational and clinical issues with a vision of improved patient outcomes.

Limitations of Measure

The data source is primarily used to facilitate sales, planning, and marketing activities; it is not focused on preparedness. There is no single factor that affects shortages of drugs and/or other medical supplies. There are combinations of economic and non-economic factors that create gaps in the supply chain. However, given that the report is produced annually by the AHA and has been relied on by government agencies since 1946, the limitations of the measure do not outweigh its value.

Use of Measure

There is a potential for improving organizational effectiveness by advancing a strategic vision for the supply chain function. The measure is an indicator that hospitals, and therefore patients, have access to life-saving drugs and/or other medical supplies when needed and that there will not be delays in care or compromised quality of patient care. Group purchasing may improve supply chain and logistical operations during a health emergency.

Data Source

American Hospital Association (AHA). *2012 AHA Annual Survey of Hospitals*. 2013 (2012 data). Additional details about this measure are available from the source. AHA collects and verifies hospital and health system data annually. Data were obtained directly from the source. For more information, contact the NHSPI Project Team through the NHSPI website at www.nhspl.org.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Given the widespread use of group purchasing, this measure is unlikely to have sufficient sensitivity and specificity related to preparedness capabilities.

Countermeasure Management

Medical Materiel Management, Distribution, & Dispensing

State maintains a supplemental cache (beyond normal operational needs) of personal protection equipment (PPE), antidotes, antivirals, and/or antibiotics for their local disaster response needs

ID	M271	Type	Process
Measure last updated	2011 (2010–2011 data)	Obtained for the Index	Jul-14

Rationale for Measure

It is important to plan and prepare for a disaster response. An emergency response may quickly consume local stores of PPE and medical countermeasures. Having a state-maintained cache of these items will shorten the resupply time to emergency responders. This may help protect first responders and prevent morbidity and mortality. It may also be anticipated that the incident will require antidotes or supplies not normally maintained within normal EMS operations and patient care parameters.

Limitations of Measure

Data for this measure were obtained from the National Association of State Emergency Medical Services Officials (NASEMSO) 2011 EMS Industry Snapshot survey distributed to the director of each state's EMS regulatory office. The aggregate result of any survey question is based on a combination of fact and opinion, and each state's response is dependent on available data sources and the operational awareness of the respective responder. While 47 states provided information, data was not available for 3 states.

Use of Measure

Disasters require resources beyond the normal capacity of any local public safety agency, and this measure recognizes whether a state maintains a supplemental cache of PPE, antidotes, antivirals, and/or antibiotics for rapid resupply of local disaster response needs in event of a mass casualty incident.

Data Source

Federal Interagency Committee on Emergency Medical Services (FICEMS). 2011 National EMS Assessment. 2011 (2010–2011 data). Additional details about this measure are available from the source. Data for this measure were compiled in the National Association of State Emergency Medical Services Officials (NASEMSO) 2011 EMS Industry Snapshot, an internal membership survey of the 56 U.S. state and territorial Emergency Medical Services (EMS) Offices completed between October 2010 and March 2011. All 50 states and 4 territories participated. NASEMSO has published measures along with a variety of surveys since 2004.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity as indicated on internal consistency reliability tests and multi-trait scaling analysis. Availability of updated data within a 3 year periodicity cycle is not confirmed.

Countermeasure Management

Countermeasure Utilization & Effectiveness

The average percentage of children ages 19-35 months who have received these individual vaccinations: four or more doses of diphtheria, tetanus, and pertussis vaccine, three or more doses of poliovirus vaccine, one or more doses of any measles-containing vaccine, and three or more doses of Hepatitis B vaccine

ID	M24	Type	Outcome
Measure last updated	2013 (2012 data)	Obtained for the Index	Jul-14

Rationale for Measure

The measure is used by the Centers for Disease Control and Prevention (CDC) and states to monitor health status and is an important measure of achievement of immunization program objectives. The measure is a pre-event indicator of the capacity of the state's public and private immunization infrastructure needed to respond to an emerging vaccine-controllable disease.

Limitations of Measure

The measure is for routine vaccine preventable disease in pre-school age children and may not reflect the vaccination rates for a severe emerging disease.

Use of Measure

The measure is a proxy indicator of basic, pediatric population vaccination coverage. The measure should be used with other measures in the Countermeasure Utilization & Effectiveness sub-domain to gain a sense of the pre-event capacity of the state's public and private immunization system.

Data Source

United Health Foundation (UHF). *America's Health Rankings*. 2013 (2012 data). Additional details about this measure are available from the source. This measure was obtained from the *America's Health Rankings* report. The data were compiled by the Centers for Disease Control and Prevention's (CDC) *National Immunization Survey* (NIS), which has collected data annually since 1994. The NIS is used to obtain national, state, and selected urban area estimates of vaccination coverage. The NIS is a random digit dialing telephone survey of households with age-eligible children, followed by a mail survey of the children's vaccination providers to validate immunization information. The measure continues to be collected.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Coverage rates for routine age-appropriate vaccinations are not direct measures of countermeasure distribution, and they may achieve better construct validity by using them as indicators in the Pre-Event Community Status domain.

Countermeasure Management

Countermeasure Utilization & Effectiveness

Senior seasonal flu vaccination rate

ID	M32	Type	Structure
Measure last updated	2013–2014	Obtained for the Index	Oct-14

Rationale for Measure

The measure focuses on adults aged 65+ who have had an influenza vaccination within the past year. This measure is used by the Centers for Disease Control and Prevention (CDC) and states to monitor health status and is an important measure of achievement of immunization program objectives. The measure is a pre-event indicator of the capacity of the state's public and private immunization infrastructure needed to respond to an emerging vaccine controllable disease.

Limitations of Measure

The measure has no apparent limitations.

Use of Measure

The measure is a proxy for senior citizen vaccination coverage against a widespread, seasonal infectious disease. This measure should be viewed alongside other measures in the Countermeasures Utilization & Effectiveness sub-domain to indicate the level to which the state has achieved preparedness in terms of vaccination and immunization, as well as the level to which the community completes a course of countermeasure usage or follows through in the use of an intervention.

Data Source

Centers for Disease Control and Prevention (CDC). *FluVaxView 2013–14 State, Regional, and National Vaccination Report*. 2013–2014. Additional details about this measure are available from the source. FluVaxView data were compiled from the CDCs' National Immunization Survey (NIS) and the Behavioral Risk Surveillance System (BRFSS). The NIS is used to obtain national, state, and selected urban area estimates of vaccination coverage annually since 1994. The BRFSS is a nationwide behavior surveillance system, and is conducted by telephone (including mobile phones). Data are collected monthly from all 50 states, the District of Columbia, American Samoa, Palau, Puerto Rico, the U.S. Virgin Islands, and Guam. BRFSS has been publishing data since 1984.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Rate expressed as a percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Coverage rates for routine age-appropriate vaccinations are not direct measures of countermeasure distribution, and they may achieve better construct validity by using them as indicators in the Pre-Event Community Status domain.

Countermeasure Management

Countermeasure Utilization & Effectiveness

Senior pneumococcal vaccination rate

ID	M33	Type	Structure
Measure last updated	2013	Obtained for the Index	Oct-14

Rationale for Measure

The measure focuses on adults aged 65+ who have ever had a pneumonia vaccination. The measure should be viewed alongside other measures in the Countermeasures Utilization & Effectiveness sub-domain as an indicator of pre-event capacity of the state's immunization system.

Limitations of Measure

The measure has no apparent limitations.

Use of Measure

The measure is a proxy for senior citizen vaccination coverage against a widespread infectious disease.

Data Source

Centers for Disease Control and Prevention (CDC). Division of Population Health (DPH). National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). *Behavioral Risk Factor Surveillance System (BRFSS): Prevalence and Trends Data*. 2013. Additional details about this measure are available from the source. The BRFSS is a nationwide behavior surveillance system, and is conducted by telephone (including mobile phones). Data are collected monthly from all 50 states, the District of Columbia, American Samoa, Palau, Puerto Rico, the U.S. Virgin Islands, and Guam. BRFSS has been publishing data since 1984. Data for this measure have been collected through BRFSS since 2002 and the most recent data are for 2013 for all states.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Rate expressed as a percentage (0–
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Coverage rates for routine age-appropriate vaccinations are not direct measures of countermeasure distribution, and they may achieve better construct validity by using them as indicators in the Pre-Event Community Status domain.

Countermeasure Management

Countermeasure Utilization & Effectiveness

Pediatric seasonal flu vaccination rate

ID	M34	Type	Structure
Measure last updated	2013–2014	Obtained for the Index	Jul-14

Rationale for Measure

The measure is used by Centers for Disease Control and Prevention (CDC) and states to monitor health status and is an important measure of the achievement of the state's immunization objectives. The measure serves as a pre-event indicator of the capacity of the immunization infrastructure in the state needed to respond to an emerging vaccine-controllable disease.

Limitations of Measure

This measure only includes children aged six months to four years old, so coverage of the pediatric population is incomplete. The measure is for routine seasonal influenza and may not reflect the coverage rates for a severe emerging disease.

Use of Measure

The measure should be viewed alongside other measures in the Countermeasures Utilization & Effectiveness sub-domain as an indicator of pre-event capacity of the state's immunization system.

Data Source

Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHC). *National Immunization Survey (NIS)*. 2013–2014. Additional details about this measure are available from the source. The NIS is sponsored by the CDC's National Center for Immunizations and Respiratory Diseases (NCIRD) and is conducted by NCIRD and NCHC. The NIS is used to obtain national, state, and selected urban area estimates of vaccination coverage annually since 1994. The NIS is a random digit dialing telephone survey of households with age-eligible children, followed by a mail survey of the children's vaccination providers to validate immunization information. The measure continues to be collected.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Rate expressed as a percentage (0–
Data Normalization	State score divided by target

Recommendation: Retain measure based on adequate construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Coverage rates for routine age-appropriate vaccinations are not direct measures of countermeasure distribution, and they may achieve better construct validity by using them as indicators in the Pre-Event Community Status domain.

Countermeasure Management

Countermeasure Utilization & Effectiveness

Adult seasonal flu vaccination rate

ID	M35	Type	Structure
Measure last updated	2013–2014	Obtained for the Index	Oct-14

Rationale for Measure

The measure focuses on influenza vaccination coverage for adults aged 18–64 years. This measure is used by the Centers for Disease Control and Prevention (CDC) and states to monitor health status and is an important measure of achievement of immunization program objectives. The measure is a pre-event indicator of the capacity of the state's public and private immunization infrastructure needed to respond to an emerging vaccine-controllable disease.

Limitations of Measure

This measure is for routine seasonal influenza and may not reflect vaccination coverage rates for a severe emerging disease.

Use of Measure

The measure is a proxy for adult vaccination coverage against a widespread, seasonal infectious disease. This measure should be viewed alongside other measures in the Countermeasures Utilization & Effectiveness sub-domain as an indicator of pre-event capacity of the state's immunization system.

Data Source

Centers for Disease Control and Prevention (CDC). *FluVaxView 2013–14 State, Regional, and National Vaccination Report*. 2013–2014. Additional details about this measure are available from the source. FluVaxView data were compiled from the CDCs' National Immunization Survey (NIS) and the Behavioral Risk Surveillance System (BRFSS). The NIS is used to obtain national, state, and selected urban area estimates of vaccination coverage annually since 1994. The BRFSS is a nationwide behavior surveillance system, and is conducted by telephone (including mobile phones). Data are collected monthly from all 50 states, the District of Columbia, American Samoa, Palau, Puerto Rico, the U.S. Virgin Islands, and Guam. BRFSS has been publishing data since 1984.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Rate expressed as a percentage (0–
Data Normalization	State score divided by target

Recommendation: Retain measure despite poor construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Coverage rates for routine age-appropriate vaccinations are not direct measures of countermeasure distribution, and they may achieve better construct validity by using them as indicators in the Pre-Event Community Status domain.

Environmental & Occupational Health

*Environmental Monitoring***Does your {state public health} laboratory provide or assure testing for air**

ID	M202	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The measure focuses on the capability of a state public health laboratory to perform testing from air samples.

Limitations of Measure

The measure is limited to one environmental matrix and does not specify what kind of testing should be performed. The measure does not address how many of these types of samples could be tested.

Use of Measure

This and other measures describe the range of different environmental matrices (water, soil, air) that state public health laboratories are capable of testing.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Environmental & Occupational Health

Environmental Monitoring

Which of the following {organizations} provide certification or accreditation of your state public health laboratory? [American Industrial Hygiene Association (AIHA), U.S. Environmental Protection Agency (EPA), National Environmental Laboratory Accreditation Conference (NELAC)]

ID	M257	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

State public health laboratories that provide environmental health testing are required to meet certain industry standards to ensure safe and accurate testing of specimens and/or samples. Certification or accreditation provides assurance that a laboratory is meeting these standards to conduct laboratory tests properly.

Limitations of Measure

The measure has no apparent limitations.

Use of Measure

The measure is a proxy for the implementation of quality standards in environmental laboratory testing. This and related measures can indicate whether a laboratory is meeting agreed upon third-party standards.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of organizations out of three

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Measure sensitivity and specificity can be enhanced by specifying these as 3 separate dichotomous variables rather than as a count variable.

Environmental & Occupational Health

Environmental Monitoring

Does your {state public health} laboratory provide or assure testing for radiologic agents in environmental samples?

ID	M197	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Being able to test environmental samples for radiological agents is an important capability for the response to and recovery from an accidental or intentional release of radiological material. Characterization of the amount and type of contamination is vital to being able to prevent unnecessary exposure and to allow re-entry after the event. Having this capability within the state can minimize turnaround time for these samples.

Limitations of Measure

The measure only indicates if the state public health laboratory has the capability, or assures it through agreement with another laboratory. It does not measure the capacity of the laboratory to process the number of samples that would be required for a response. The measure does not indicate if the agreement laboratory is appropriately located to minimize sample transport time.

Use of Measure

The measure should be used to understand if a state has the capability to test for radiological agents in environmental samples.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Environmental & Occupational Health

Environmental Monitoring

Does your {state public health} laboratory provide or assure testing for environmental samples in the event of suspected chemical terrorism?

ID	M196	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

A state needs to be capable of determining, by appropriate scientific methods, agents involved in a suspected act of chemical terrorism. It is also necessary to be able to determine the prevalence of such agents in air, food, and water resources by testing environmental samples. This is both a measurement indicative of the incident and a measure of mitigation and recovery effectiveness.

Limitations of Measure

The measure is based on a response to the *Comprehensive Laboratory Services Survey* distributed to the 51 state laboratories represented by the Association of Public Health Laboratories (APHL), and the response is subject to the objectivity of the survey responder. The survey question asks if the laboratory provides or assures testing of environmental samples in the event of suspected chemical terrorism, which may or may not include air, food, and/or water.

Use of Measure

Having the laboratory capacity to assess contaminants released as part of a terrorist act, accidental chemical release, or similar incident with potential to affect the quality of air, food, or water is critical to a state's ability to assess and respond to a public health emergency, and this measure indicates if states maintain such capacity. The measure should be viewed with other measures in the Food & Water Security sub-domain to better understand the capacity and capability of the state's preparedness to respond to health emergencies.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey* (CLSS). 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity as indicated on internal consistency reliability tests and multi-trait scaling analysis. No validation results from prior studies are available to support the measure. Measure may represent a low performance threshold that is already met by all or most states. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Environmental & Occupational Health

Environmental Monitoring

Does your {state public health} laboratory test for {number of following} contaminants {in environmental samples}: asbestos, explosives, gross alpha and gross beta, inorganic compounds (e.g., nitrates), metals, microbial, lead, persistent organic pollutants, pesticides (including organophosphates), pharmaceuticals, radon, or volatile organic compounds?

ID	M272	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

The ability of a state's public health laboratory to test for a broad spectrum of potential environmental contaminants known to cause human health effects is important. Environmental monitoring for these contaminants during a health emergency will allow responders to identify areas that should be restricted and help establish protective actions to minimize public and first responder exposure.

Limitations of Measure

The measure only indicates that a state public health laboratory has the ability to test these contaminants. The measure does not indicate the quality of the testing or the through-put or capacity of the laboratory testing. Because this measure only evaluates state public health laboratories, another laboratory in a state may provide these testing services.

Use of Measure

The measure should be used to better understand a state's ability to test for contaminants of health concern. The measure should be used with other measures in the Environmental Monitoring sub-domain to more fully understand a state's ability and capacity to test for environmental contamination.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Data Type Qualitative

Data Integration Predefined choice

Data Normalization Number of contaminants out of twelve

Environmental & Occupational Health

Environmental Monitoring

Does your {state public health} laboratory provide or assure testing for hazardous waste?

ID	M273	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Disasters and other events can cause the release of substances that are the by-product or waste of industrial processes into the environment. These substances are often toxic and hazardous to human health. It is important that the state laboratory has the capability to test for hazardous substances (or can assure that this capability exists). This capability is significant in characterizing the area contaminated by the release and is also essential to the clean-up and site remediation/restoration.

Limitations of Measure

The measure only considers the ability to test for substances, not the overall capacity for timely response and characterization of the release of hazardous waste to the environment.

Use of Measure

The measure should be used with other measures in the Environmental Monitoring sub-domain to understand a state's capacity and capability to respond to environmental contamination during health emergencies.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Environmental & Occupational Health

Environmental Monitoring

State participates in the National Plant Diagnostic Network (NPDN)

ID	M274	Type	Process
Measure last updated	2014	Obtained for the Index	Jul-14

Rationale for Measure

The National Plant Diagnostic Network (NPDN) was established in 2002 in response to the need to enhance agricultural security through protecting health and productivity of plants in agricultural and natural ecosystems in the U.S. The NPDN is a national consortium of plant diagnostic laboratories with the specific purpose of quickly detecting and identifying plant pests and pathogens of concern.

Limitations of Measure

A “yes” response to this measure indicates that a state is participating in the NPDN. The limitation is that there is no indication as to what level or how effectively the state is participating (i.e., how many resources has the state committed, or how successful the state is in meeting the goal of quickly detecting and identifying pathogens).

Use of Measure

Participation in the NPDN supports a national surveillance function that is important in protecting agricultural, forest, and landscape plants from pests and pathogens and the subsequent potential adverse human health and economic effects that plant and crop damage can have. Participation in the NPDN also provides states with training opportunities as well as establishing secure communications protocols.

Data Source

National Plant Diagnostic Network (NPDN). National Plant Diagnostic website. 2014. Additional details about this measure are available from the source. NPDN maintains a map of states that participate.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Boolean
Data Normalization	Yes=1, No=0

Recommendation: Exclude measure from Index due to lack of variation across states and poor performance as indicator of capability. Measure reflects a low performance threshold that all states already meet, contributing to poor measure sensitivity and specificity. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Environmental & Occupational Health

Food & Water Security

Which of the following {organizations} provide certification or accreditation of your state public health laboratory? [Food & Drug Administration (FDA), United States Department of Agriculture (USDA)]

ID	M258	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

State public health laboratories must have federal certification or accreditation to conduct food testing. Certification or accreditation provides assurance that a laboratory is meeting industry standards for the ability to conduct proper food testing.

Limitations of Measure

The measure has no apparent limitations.

Use of Measure

The measure is a proxy for the implementation of quality standards in food testing. This and related measures can indicate whether a laboratory is meeting federal and industry standards.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of organizations out of

Recommendation: Exclude measure from Index due to poor construct validity as indicated on internal consistency reliability tests and multi-trait scaling analysis. No validation results from prior studies are available to support the measure. Measure may represent a low performance threshold that is already met by all or most states. Inclusion of measures with low performance thresholds may also limit scientific and professional credibility of the Index.

Environmental & Occupational Health

Food & Water Security

Does your {state public health} laboratory test for {number of following types of} water: drinking, private well-water, recreational, surface, underground storage tanks, or waste?

ID	M275	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Having the capability at a state public health laboratory to test different types of water samples is important to the characterization of various water-based environments that may be contaminated or otherwise affected by a health security event. Being able to rapidly characterize the level of contamination is important for preventing exposure and being able to allow re-entry/use during the recovery phase of an event.

Limitations of Measure

The measure only indicates whether the state public health laboratory has the capability to test water in various environments. The measure does not evaluate if other state laboratories have this capability, or if the public health laboratory has the capacity to test the amount of samples necessary to respond to a health security event.

Use of Measure

The measure is an indicator that the state public health laboratory has the ability to test water in various environments. This measure should be viewed with other measures in the Food & Water Security sub-domain to gain a better understanding of a state's capacity and capability to investigate food- and waterborne illness.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of tests out of six

Recommendation: Retain measure due to acceptable construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests.

Environmental & Occupational Health

Food & Water Security

For which of the following organisms or their toxins does your {state public health} laboratory provide or assure testing for food and or water samples to assist with foodborne disease outbreak investigations:

Bacillus cereus, Brucella sp., Campylobacter sp., Clostridium botulinum, Clostridium perfringens, Cryptosporidium sp., Cyclospora cayetanensis, Listeria monocytogenes, norovirus, Salmonella, Shigella, Staphylococcus aureus, STEC non-O157, STEC O157, Vibrio sp., Yersinia enterocolitica

ID	M276	Type	Process
Measure last updated	2012	Obtained for the Index	Jul-14

Rationale for Measure

Being able to test for the most important agents that cause foodborne disease is an important capability of a state public health laboratory. Rapid identification of these agents in food and water samples can enhance the investigation of foodborne disease outbreaks and is important in identifying the source of the contamination.

Limitations of Measure

The measure indicates that the state public health laboratory either has these testing capabilities or assures that the tests can be done by agreement with another laboratory. Agreement laboratories may not be located to facilitate rapid transport and timely testing.

Use of Measure

The measure should be used to understand the state's capability to test for the most important causes of foodborne illness. This measure should be viewed with other measures in the Food & Water Security sub-domain to gain a better understanding of a state's capacity and capability to investigate food- and waterborne illness.

Data Source

Association of Public Health Laboratories (APHL). *Comprehensive Laboratory Services Survey (CLSS)*. 2012. Additional details about this measure are available from the source. Data have been compiled by APHL biennially since 2004. The CLSS covers the 50 states, the District of Columbia, and Puerto Rico. State-level data are not available to the public but can be accessed by public health laboratory directors, among others. Data were obtained directly from the source.

Target Setting

Subject matter expert opinion

Data Type	Qualitative
Data Integration	Predefined choice
Data Normalization	Number of organisms out of sixte

Recommendation: Retain measure despite low construct validity as indicated on multi-trait scale analysis and internal consistency reliability tests. Prior studies have confirmed construct validity and reliability of the measures individually. Specification as a count variable contributes to validation problems by introducing inconsistencies in scaling. Measure sensitivity and specificity may be improved by using dichotomous measures of a subset of specific testing modalities that can serve as sentinel signals of capability.

Environmental & Occupational Health

Food & Water Security

Percent of community water systems {in the state} that meet all applicable health-based standards through approaches that include effective treatment and source water protection

ID	M195	Type	Outcome
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

Safe and sanitary drinking water is vital to a community's health and wellbeing. Community (public) water supplies and systems that have difficulty providing water that meets the health-based standards are more likely to be systems that are not adequately maintained or operated.

Limitations of Measure

The measure does not cover drinking water supplies that are non-public (private) and does not directly provide information on community water supplies that were adversely affected by emergencies or disasters.

Use of Measure

The measure is a proxy for the quality of the state's communities' drinking water systems and their potential vulnerability during a health emergency or disaster.

Data Source

U.S. Environmental Protection Agency (EPA). *Safe Drinking Water Information System Federal (SDWIS/FED) Drinking Water Data*. 2013. Additional details about this measure are available from the source. EPA SDWIS/FED compiles data on approximately 156,000 public water systems in the United States.

Target Setting

Statistically calculated

Data Type	Quantitative
Data Integration	Percentage (0–100)
Data Normalization	State score divided by target

Recommendation: Modify measure due to poor construct validity as indicated on internal consistency reliability tests and multi-trait scaling analysis. Measure sensitivity and specificity can be improved by recalibrating the measure as: the percent of the state population served by public water systems that exceeded no EPA standards for safe drinking water during the past year.

Environmental & Occupational Health

Food & Water Security

State operate{s} its own meat and/or poultry inspection program

ID	M277	Type	Structure
Measure last updated	2013	Obtained for the Index	Jul-14

Rationale for Measure

The U.S. Department of Agriculture's Food Safety and Inspection Service conducts at least annual comprehensive reviews of state meat and poultry inspection (MPI) programs and their requirements—including enforcement of those requirements—with respect to slaughter, preparation, processing, storage, handling, and distribution of livestock carcasses and parts, meat and meat food products, and poultry products. States are not required to provide MPI programs but may opt to provide an equivalent regulatory program.

Limitations of Measure

The measure does not indicate the competency and capacity of the state-run MPI regulatory program.

Use of Measure

The measure may be used as an indicator of a state's capability and capacity to insure the safety of meat and poultry. Should a large scale (multi-state) event take place, federal resources would be potentially stretched to cover all affected states. States having their own capacity and capability would be better positioned to maintain continuity of inspection services.

Data Source

United States Department of Agriculture (USDA). Food Safety and Inspection Service (FSIS). *States Operating Their Own Meat and Poultry Inspection (MPI) Programs*. 2013 data. Additional details about this measure are available from the source. USDA FSIS maintains a list of states operating their own MPI programs.

Target Setting

Subject matter expert opinion

Data Type Qualitative

Data Integration Boolean

Data Normalization Yes=1, No=0

Recommendation: Exclude measure from Index due to poor construct validity as indicated on internal consistency reliability tests and multi-trait scaling analysis. No validation results from prior studies are available to support the measure.

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