Key Changes to the 2017 Preparedness Index

The purpose of this document is to delineate the key differences between the 2017 Index and the 2016 Index. While we discuss some aspects of the Index methodology here, one should refer to 2017 National Health Security Preparedness Index Methodology for a more detailed and comprehensive discussion of the Index's structure, composition, and methodology.

The National Health Security Preparedness Index tracks the nation's progress in preparing for, responding to, and recovering from disasters and other large-scale emergencies that pose risks to health and well-being in the United States. Because health security is a responsibility shared by many different stakeholders in government and society, the Index combines measures from multiple sources and perspectives to offer a broad view of the health protections in place for nation as a whole and for each U.S. state.

Each state and the District of Columbia has an overall Preparedness Index score that, theoretically, can range from 0 to 10. This score is determined by how well a state performs on 139 factors or *item measures*. An example of an item measure is the number of physicians and surgeons per 100,000 in the state. Some measures vary significantly across the states and DC, with some scoring high and others low. A select number of measures, however, do not vary across the states—that is, all states score uniformly high or satisfy the requirements of the measure. An example is the CDC's Behavioral Risk Factor Surveillance System (BRFSS), a critically important annual survey of a state's population to estimate individual health behaviors, practices, and outcomes. Since all 50 states and the District of Columbia participate in the BRFSS, this item measure—along with 18 others—has achieved the status of *foundational measure*. We distinguish between *variable* item measures and foundational measures, which are by definition *constants*, because we treat them differently when calculating Index scores. All item measures are grouped into categories like health security surveillance, healthcare delivery, and other areas that we refer to as *domains* and *subdomains*.

In total, the Index has 139 measures derived from 59 different sources. These measures are organized into 6 domains and 19 subdomains. Index values are calculated for 4 years, 50 states, and the District of Columbia, for each subdomain, domain, and an overall Index score.

KEY CHANGES FROM 2016 RELEASE

Geographic Expansion:
Data are added for all measures for the District of Columbia (DC).

Total Index Measures:
The total number of Index measures increased from 134 in 2016 to 139 in 2017, including both Item measures and Foundational measures (see Table 1):

Table 1: Measure Type and Count, 2016 and 2017 Releases		
	2016 Release	2017 Release
Variable Item measures	116	120
Foundational measures	18	19
Total measures	**134**	**139**

Key Changes to Index Measures from 2016:
The changed measures are listed on the following pages (see Table 2), grouped by the Index Domains and Subdomains including:

- Nine item measures that are NEW to the 2017 Index and were not included in 2016, and data were added for all four years as available;
- One item measure in the 2016 Index that is a Foundational Measure in the 017 Index release;
- Seven item measures with changed specifications from the 2016 to the 2017 Index release as recommended by Association of Public Health Laboratories, which fields the survey from which data for these measures is drawn, with changes made to all years of data as available; and
- Four measures that were in the 2016 Index but REMOVED from the 2017 release; three removed because updated data are no longer being collected, and one removed because the function is no longer a required state responsibility.

Methodology:
All methodological changes implemented for the 2016 Index continue in the 2017 Index release (see 2017 National Health Security Preparedness Index Methodology), including:

- Normalization of each measure to a standard ten-point scale;
- Weighting of each measure based on expert panel ratings;
- Imputation for missing values;
- Longitudinal comparisons for measures for four years of data (increased from three years in 2016 Index); and
- Confidence Intervals for national summary measures.

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TABLE 2: Key Measure Changes for the 2017 Index	
Domain 1: Health Security Surveillance	
Subdomain 1.1: Health Surveillance & Epidemiological Investigation	
M256 - Does your state public health laboratory participate in either of the following federal surveillance programs [Foodborne Diseases Active Surveillance Network (FoodNet) or National Molecular Subtyping Network for Foodborne Disease Surveillance (PulseNet)]?	Changed to a foundational measure **and** specification changed for 2017
Subdomain 1.2: Biological Monitoring & Laboratory Testing	
M1314 - Has your chemical terrorism/threat (CT) laboratory OR radiological terrorism/threat (RT) laboratory been certified or accredited by College of American Pathologists (CAP) or Clinical Laboratory Improvement Amendments (CLIA)? (1=Yes, 0=No)	Specification changed for 2017
M8 - Does your state public health laboratory (PHL) 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)? Or, does your PHL have a plan to handle a significant surge in testing over a six to eight week period in response to an outbreak or other public health event?	Specification changed for 2017
M211 - 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 meningitides serotyping, Plasmodium identification, Salmonella serotyping, Shigella serotyping, Varicella serology] The state's value is equal to the percentage of these tests performed.	Specification changed for 2017
M216 - 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] The state's value is equal to the percentage of these tests performed.	Specification changed for 2017
M911 - Does your {state public health} laboratory provide or assure testing for soil?	**New measure for 2017**
M902 - An indication of whether the state has a Level 1 or Level 2 LRN-C Laboratory	**New measure for 2017**
Domain 2: Community Planning & Engagement Coordination	
Subdomain 2.1: Cross-Sector / Community Collaboration	
M47 - Is your state education agency a member of the state emergency planning committee?	*Removed, updated data are no longer collected*
M9031 - Percentage of {hospitals} that participate in Health Care Coalitions supported through the federal Hospital Preparedness Program of the Office of the Assistant Secretary for Preparedness and Response.	**New measure for 2017**
M9032 - Percentage of {emergency medical service agencies} that participate in Health Care Coalitions supported through the federal Hospital Preparedness Program of the Office of the Assistant Secretary for Preparedness and Response.	**New measure for 2017**

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TABLE 2: Key Measure Changes for the 2017 Index	
M9033 - Percentage of {emergency management agencies} that participate in Health Care Coalitions supported through the federal Hospital Preparedness Program of the Office of the Assistant Secretary for Preparedness and Response.	**New measure for 2017**
Subdomain 2.1: Cross-Sector / Community Collaboration, continued	
M9034 - Percentage of {local health departments} that participate in Health Care Coalitions supported through the federal Hospital Preparedness Program of the Office of the Assistant Secretary for Preparedness and Response.	**New measure for 2017**
Domain 4: Healthcare Delivery	
Subdomain 4.2: Hospital and Physician Services	
M906 - The percentage of short-term general and Critical Access hospitals that have demonstrated meaningful use of certified electronic health record technology (CEHRT). This includes the demonstration of meaningful use through either the Medicare and Medicaid EHR Incentive Programs. Critical Access hospitals are facilities with no more than 25 beds and located in a rural area further than 35 miles from the nearest hospital, and/or are located in a mountainous region.	**New measure for 2017**
M907 - The percentage of all office-based medical doctors and doctors of osteopathy that have demonstrated meaningful use of certified electronic health record technology (CEHRT). This includes the demonstration of meaningful use through either the Medicare and Medicaid EHR Incentive Programs.	**New measure for 2017**
Subdomain 4.3: Long-Term Care	
M311 - {State average} nursing home staffing turnover. Recommend deleting this measure.	*Removed, updated data are no longer collected*
M312 - {Percentage of} long-stay nursing home residents hospitalized within a six-month period.	*Removed, updated data are no longer collected*
Domain 5: Countermeasure Management	
Subdomain 5.1: Medical Materiel Management, Distribution, & Dispensing	
M68 - Degree to which state has a repackaging procedure in place, particularly for bulk medications for public dispensing	*Removed, this function is no longer required*
Domain 6: Environmental & Occupational Health	
Subdomain 6.1: Food & Water Security	
M276 - 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. The state's value equals the percentage of tests performed.	Specification changed for 2017

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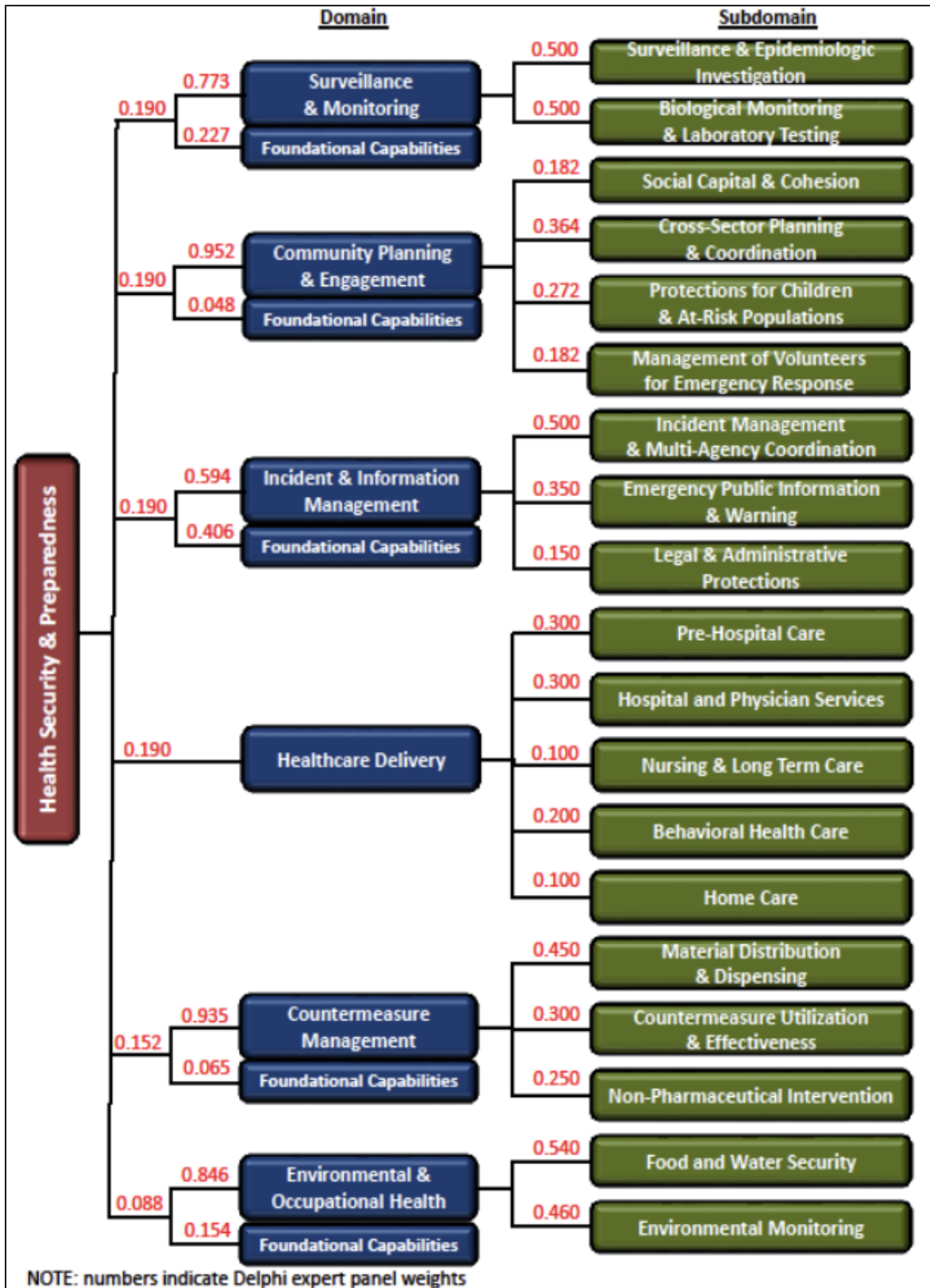| TABLE 2: Key Measure Changes for the 2017 Index	
Subdomain 6.2: Environmental Monitoring	
M272 - Does your {state public health} laboratory test for contaminants {in environmental samples}: asbestos, explosives, gross alpha and gross beta, inorganic compounds (e.g., nitrates), metals, microbial, lead, persistent organic pollutants, pesticides (including organophosphates), pharmaceuticals, radon, or volatile organic compounds? The state's value is equal to the percentage of these tests performed.	Specification changed for 2017
M904 - {Number of} Environmental Scientists and Specialists, Including Health {per 100,000 population}	**New measure for 2017**

UPDATES TO THE INDEX WEIGHTING

We used an expert panel methodology to derive weights for each of the 9 item measures listed in the table above that are identified as a new measure for the 2017 Index. Adopting the same approach that was used for the 2016 Index, we utilized an online multi-stage Delphi process (refer to Methodology for the 2016 National Health Security Preparedness Index for details).

A separate expert panel was convened for each domain included in the Index model, with each panel comprised of subject matter experts who were identified through a nomination process and reviews of the preparedness scientific and professional literature. In total, 185 experts were identified and invited to participate in the item measure assessment, with 71 experts participating (38 percent) in the first round and 74 (40 percent) in the second round. The iterative Delphi assessment of individual measures was conducted from January 9, 2017 to February 17, 2017. The final weights used in Index calculations are shown in Figure 1 below. Some of the weights are slightly different from the weights used in the 2016 Index.

Figure 1:
Delphi Weights for Constructing 2017 Index Subdomain, Domain, and Overall Summary Measures

NOTE: numbers indicate Delphi expert panel weights

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