Healthcare System Readiness

ENVIRONMENTAL SCAN REPORT

OCTOBER 19, 2018

NATIONAL QUALITY FORUM

This report is funded by the Department of Health and Human Services under contract HHSM-500-2017-00060I 75FCMC18F003.

CONTENTS

BACKGROUND AND PURPOSE

The ability to prepare for, and respond to, natural or manmade disasters such as bioterrorism, disease outbreaks, and inclement weather—is vital to meet the health needs of the nation. While the United States, as a whole, has well developed emergency management capabilities, and has made additional gains in preparedness efforts, regional variations in healthcare resources, capabilities, and capacity to respond are vast.[1] This affects communities' abilities to respond to public health emergencies and disasters, contributing to inequities in healthcare preparedness and response. Regional, state, and federal assets such as the Disaster Medical Assistance Teams (DMATS) and the National Disaster Medical System (NDMS) are key in responding to disasters and public health emergencies. Yet, there is often a delay in deploying them, and they are rarely engaged in the more frequent low to moderate sized events such as mass shootings, bus or train crashes, and large fires. The private sector healthcare system delivers most of the healthcare in the U.S. and is often the first line of defense during these types of disasters and public health incidents. Successful and robust responses to health threats require collaborative action and engagement between public sector entities and private sector healthcare facilities.

Healthcare systems are critical resources during disasters and public health emergencies. Key to this is readiness, which is the ability of hospitals, healthcare systems, and communities to rapidly identify, evaluate, and react to a wide spectrum of emergency conditions. However, quality measurement efforts for readiness are relatively underdeveloped, particularly compared to measurement of everyday care delivery. Quality measurement efforts to date have primarily focused on measuring day-to-day activities and outcomes of providers, clinics, healthcare systems, and health plans. Although healthcare systems are required to have emergency management plans to meet the requirements of accreditation and accountability programs, few metrics exist for healthcare facilities, healthcare systems, and even communities to assess and evaluate readiness. Furthermore, among the measures that do relate to readiness, only a few focus on non-day-to-day healthcare activities such as rapid unscheduled visits related to a particular incident, or structural challenges (flooded basements, loss of power) and operational challenges (staffing, surge capacity) related to maintaining high-quality operations during and following disaster events.[2,3]

Several factors contribute to the challenge of developing metrics for natural and manmade disasters. Unlike routine clinical care, disasters and public health emergencies are relatively infrequent events, making it a challenge for healthcare systems to justify the often vast but necessary resources to be truly ready for any disaster or public health emergency. Nevertheless, these events have steadily increased over the years and are an ever-present challenge for the healthcare enterprise and for communities. Additionally, disasters and public health

emergencies can vary greatly. In the past few years, the U.S. has experienced hurricanes, such as Sandy, Harvey, and Maria; mass shootings at Sandy Hook Elementary, an Orlando nightclub, Las Vegas, and Stoneman Douglas High School; and wildfires in the U.S. Northwest Territories and Northern California. The variety in disasters often presents a unique set of challenges.[4] In addition, measurement strategies for routine clinical care are developed based on evidence generated from observing numerous, frequent cases for one or more specific conditions or situations.[4,5] By comparison, because every disaster is different, little empirical research exists to support readiness practices that can clearly link a particular structure or process with an outcome. The result is a state of literature where most frameworks and guidance for readiness are drawn from case studies and focus on lessons learned from a unique situation.

Understanding the challenges in measuring healthcare readiness, the National Quality Forum (NQF)—a consensus-based entity and an experienced convener of multistakeholder groups for developing consensus around diverse and challenging topics—convened the Regionalized Emergency Medical Care Services (REMCS) Panel in 2012 to provide recommendations around quality measurement for emergency preparedness and care. The Panel's report, **Regionalized Emergency Medical Care Services: Emergency Department Crowding and Boarding, Healthcare System Preparedness and Surge Capacity – Performance Measurement Gap Analysis and Topic Prioritization**, focused on linking daily surge capacity with the readiness of the healthcare system for the next public health emergency, and also focused on furthering the science of measuring ED crowding as well as preparedness.[6] With respect to readiness, the REMCS Panel provided several recommendations for measure developers to consider that could address emergency quality measurement challenges in preparedness and response. These included how measures will drive local resource prioritization, recommendations to move beyond measuring "drill completion" to drill performance, how best practices could serve as a basis for quality measurement, assessing the ability of an organization to adapt following a disaster (i.e., recovery), and adapting existing measures that can be scaled up to the facility, system, and/or population level.

Driven by the work performed by the 2012 REMCS Panel, NQF has taken on a new project at the request of the Department of Health and Human Services (HHS) to develop an actionable measurement framework to assess the readiness of hospitals, healthcare systems, and communities to respond to and recover from disasters and public health emergencies. Developing a framework, key domains, and ultimately outcome measures that objectively measure healthcare system preparedness is critical to determining the nation's readiness to respond.

To accomplish these goals, NQF will:

1. Convene a multistakeholder group to develop a definition of healthcare system readiness,
2. Conduct an environmental scan of developed measures and measure concepts related to readiness,
3. Identify potential measurement proxies for readiness, and
4. Elicit multistakeholder input to prioritize measures, measure concepts, and measure gaps to inform future measure development and quality improvement efforts.

Below we describe the results of the initial environmental scan.

METHODOLOGY AND APPROACH

NQF conducted an environmental scan of the literature to help assess healthcare system readiness, which included a search strategy as well as inclusion/exclusion criteria. A goal of the environmental scan was to identify the current landscape of healthcare readiness, along with the universe of hospital- and community-based quality and performance measures and measure concepts that could be used to assess the readiness of hospital systems and communities to respond to and recover from disasters and public health emergencies. The environmental scan built on the work of the REMCS project. NQF conducted a supplemental scan focused on performance measures related to readiness for all hazards, and included material that had been developed since the 2012 REMCS report.

The scan provides a sample of the universe of measures and measure concepts that could be used to fill gaps in the measurement of healthcare system readiness. In addition, the scan provides materials and context for the Committee to consider such as definitions of what it means to be prepared for various types of hazards including man-made events and naturally occurring disasters.

The environmental scan focused on the concepts of readiness, preparedness, and response for hospitals and healthcare systems and was conducted using a set of research questions. The concept of readiness was defined as a measure of the extent of preparedness, or as an outcome of being prepared for an emergency. Other relevant definitions can be found in **Appendix A**. The questions and definitions guided research efforts and ensured that the information sources collected are relevant to the project objectives. For the purposes of the scan, these questions were used solely for the purposes of searching and selecting appropriate articles and publications with respect to the topic of emergency response along with health system preparedness and readiness. The research questions are presented below:

- What is the current landscape of hospital- and community-based performance measures that can assess the readiness of hospitals systems and communities to respond to and recover from disasters and public health emergencies? What are the measure concepts and proxy outcome measures that can be translated into performance measures to predict hospital and community-level readiness?
- What are the most commonly used frameworks that address emergency readiness? What is already required for readiness by The Joint Commission and the Centers for Medicare and Medicaid Services (CMS) including other regulatory/accreditation bodies (e.g., Federal Emergency Management Agency [FEMA])?
- How do The Joint Commission, CMS, the Hospital Preparedness Program (HPP), and the Healthcare Coalitions (HCCs) or other accreditation and regulatory entities measure readiness?
- What are the key elements specific to readiness for various types of hazards including man-made and naturally occurring disasters? What are the key data elements specific to readiness quality measures?
- How can readiness measures be framed from different perspectives, i.e., patients, hospitals, communities?
- What are priority gaps in healthcare system readiness measurement?

More information on the methodology of the environmental scan can be found in **Appendix B**.

The environmental scan focused only on measures where measure specifications were available. However, the available measure universe was very limited. Besides the 2012 REMCS report, NQF reviewed the NQF Quality Positioning System (QPS), CMS Measures Inventory, and the Healthcare Effectiveness Data and Information Set (HEDIS). Relevant measures are provided in **Appendix C**.

ENVIRONMENTAL SCAN SUMMARY

NQF initially found 917 sources of information on the initial search employing methods outlined in **Appendix B**. The search methods were further refined by determining the relevancy of the sources to the aforementioned research questions. Each source was individually scored (on a 0-2 scale) on how many of the research questions the article addressed, how directly the article addressed the concept of readiness, and if the content of the source was derived from a sound approach (with a maximum score of 6). Sources with a combined score of four or greater were reviewed more closely. This scoring system narrowed the results to 209 sources of information. These sources received an additional review to determine if each source was directly relevant to the scope of the project. This final review identified 56 directly relevant sources comprised of frameworks, guidelines, instruments, lessons learned/best practices, and measures related to healthcare system readiness. The results are described below.

Frameworks

There are many well-defined public health and federal preparedness and emergency response frameworks; however, none is specific to readiness measurement. Additionally, public health emergency preparedness frameworks include guidance for communication and community partnerships, but there are no frameworks or guidance for public and private sector partnerships in disaster response, especially in response and recovery efforts. Five frameworks were identified as most relevant to this project: Common Ground Preparedness Framework (CGPF); National Planning Frameworks; the National Health Security Strategy and Implementation Plan; the National Health Security Preparedness Index; and Centers for Disease Control and Prevention's (CDC) Public Health Preparedness Capabilities: National Standards for State and Local Planning. Table 1 provides more detail about these frameworks.

TABLE 1. FRAMEWORKS

Framework	Descriptions
Common Ground Preparedness Framework[7]	Pre-incident, incident, and post-incident in the following domains: prepare; monitor; investigate; intervene; recover; and manage
FEMA/DHS National Planning Frameworks[8]	There are frameworks for each preparedness mission area and in each describe how the **whole community** works together to achieve the **National Preparedness Goal**. Frameworks include: Prevention; Protection; Mitigation; Response; and Disaster Recovery.
National Health Security Strategy and Implementation Plan[9]	The goal of the NHSS is supported by five strategic objectives: 1. Build and sustain healthy, resilient communities. 2. Enhance the national capability to produce and effectively use both medical countermeasures and nonpharmaceutical interventions. 3. Ensure comprehensive health situational awareness to support decision making before incidents and during response and recovery operations. 4. Enhance the integration and effectiveness of the public health, healthcare, and emergency management systems 5. Strengthen global health security.
National Health Security Preparedness Index (NHSPI)[10]	The Index's conceptual framework and structure were developed by a broad collection of health security and preparedness stakeholders and includes: 1. Health Security Surveillance 2. Community Planning & Engagement Coordination 3. Incident & Information Management 4. Healthcare Delivery 5. Countermeasure Management 6. Environmental & Occupational Health
CDC Public Health Preparedness Capabilities: National Standards for State and Local Planning[11]	Identifies 15 public health preparedness core capabilities: 1. Community Preparedness 2. Community Recovery 3. Emergency Operations Coordination 4. Emergency Public Information and Warning 5. Fatality Management 6. Information Sharing 7. Mass Care 8. Medical Countermeasure Dispensing 9. Medical Material Management and Distribution 10. Medical Surge 11. Non-Pharmaceutical Interventions 12. Public Health Laboratory Testing 13. Public Health Surveillance and Epidemiological Investigation 14. Responder Safety and Health 15. Volunteer Management

There were an additional three frameworks identified in the scan that are not directly relevant but offer important concepts that relate to healthcare system readiness. The additional frameworks include a Donabedian-inspired Public Health Preparedness Logic Model that organizes public health preparedness and response capabilities into three domains: capacities; response capabilities; and objectives. In addition, Barnett et al. provide examples of applying public health readiness and response planning examples to the all-hazard Haddon Matrix framework which applies pre-event, event, and post-event activities to the four influencing factors of host, agent/vehicle, physical environment, and social environment.[12,13] And, Birnbaum et al. in their Disaster Health Conceptual Framework suggest that understanding the epidemiology of disasters is core to preparedness and that a disaster is a failure of resilience for that event.[14]

Because there is no clear, existing framework for quality measurement for readiness, it is likely that a framework for this project will need to be developed anew. A broader goal of this project will be to choose one or more of these frameworks and potentially apply them to quality measurement for readiness under the guidance of the multistakeholder Healthcare System Readiness Committee (**Appendix D**). In addition, developing a framework specific to readiness will allow us to identify measurement principles that are in and out of scope to help focus recommendations and improve the value of the guidance for measure developers in this area.

Guidelines or Guidance

Guidelines and guidance related to public health emergencies and disasters usually focus on structural and process needs related to preparing for emergencies as well as some guidance around cataloguing and quantifying response efforts. Most of these guidelines relate to hospitals and either refer to or build on the national frameworks mentioned previously. The most relevant guidance documents are from CMS, The Joint Commission, and the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR). Table 2 provides more detail on these guidelines. In addition, the American College of Emergency Physicians (ACEP) and the Hospital Incident Command System are nongovernment sources for preparedness-related guidance as well as nonprofit foundations such as the Commonwealth Fund.

The CMS Emergency Preparedness Rule established necessary hospital-related processes and structures needed to foster preparedness and compliance with the regulation that is tied to Medicare and Medicaid payment.[2] Similarly, The Joint Commission provides hospital-based standards for planning and preparedness that will build the organization's readiness capabilities.[3] These criteria are directly linked to hospital credentialing and accreditation. All of these publications address hospital preparedness; however, other agencies such as APSR and CDC also address health system preparedness and public health at large.

Note that nonhospital-related guidance does exist and is usually very specific such as preparedness for bioterrorism and rural mass casualty. Some of these guidelines focus on frameworks and offer broad guidance on core competencies in the form of recommendations. The National Health Security Strategy and the National Biodefense Strategy cover many different topics, all of which are relevant for public health emergencies and disasters.

The guidelines are mostly based on core concepts or broad recommendations. Even though measures currently do not exist, these concepts, such as metrics of readiness and successful simulations, provide topic areas for developing measures in the future.

These organizations and guidance documents include a variety of ways that hospitals and other organizations are held accountable for readiness. Many of these requirements for readiness could serve as candidate measures for further development as well.

TABLE 2. READINESS GUIDANCE

Type of Guidance	Topics and Content Covered
CMS Emergency Preparedness Rule[2]	Establishes national emergency preparedness requirements to ensure adequate planning for all hazards and foster coordination with federal, state, tribal, regional and local emergencies preparedness systems.
The Joint Commission Emergency Management Standards[3]	Hospital-focused emergency management related processes and structures tied to hospital accreditation.
HHS Office of the Assistant Secretary for Preparedness and Response (ASPR)[15]	Provides hospitals, coalitions, and general public health related guidance. Also refers to the National Health Security Strategy and the 2017-2022 Health Care Preparedness and Response Capabilities document.
CDC Emergency Preparedness and Response (including National Health Security Strategy)[16]	Broad as well as specific event-related guidance for safety and security. Also ties guidance to the National Health Security Strategy.
National Health Security Strategy (NHSS)[9]	The National Health Security Strategy (NHSS) is a strategic plan developed by the United States Department of Health and Human Services to help minimize the consequences associated with significant health incidents.
National Biodefense Strategy[17]	The National Biodefense Strategy builds on lessons learned from past biological incidents to develop a more resilient and effective biodefense enterprise. The strategy will include a comprehensive evaluation and monitoring of the nation's biodefense needs across the entire range of biological threats.

Readiness Instruments or Assessment Tools

This scan identified several tools that directly relate to assessing readiness, preparedness, and resilience. These instruments focused for the most part on public health emergency preparedness, but also include hospital and healthcare coalition surge, pediatric readiness domains (included in the Emergency Medical Services for Children Readiness Toolkit), and infectious disease response.[18] In general, the approach to these assessments include the Donabedian structure, process, outcome model. However, one researcher noted that outcomes in the area of preparedness are problematic, as public health emergencies are rare, and the averted morbidity and mortality are difficult to ascertain.[19] A review of preparedness assessment instruments by Asch et al. determined that while there was a great deal of overlap across domains of 27 public health preparedness evaluation instruments, there was very little agreement on what actually constitutes "preparedness." A review of 11 hospital disaster preparedness tools by Heidaranlu et al. found overlap on certain concepts of preparedness but also highlighted the need for greater standardization, a focus on "functional" aspects of preparedness, and development of tools based on empirical testing.[20] Research has proposed that the lack of evidence supporting the processes of public health practice in the area of preparedness has forced a reliance upon expert opinion or upon structural measures that have an unproven relationship to the desired outcomes, such as readiness.[19]

The success of using instruments or assessment tools is complicated by the dearth of systematic evidence linking specific preparedness structures to the ability to effectively respond to the unique needs of a particular incident. Drills and exercises have been highlighted as an opportunity to observe implementation of key processes, yet the evidence linking to health outcomes remains thin.[5]

There are two types of exercises: operations-based and discussion-based tabletop exercises which are either done with no notice or low notice. There is general agreement that while exercises do play an important role in driving process improvement, they are seldom linked to clear performance standards and metrics. The wide range and variation in type of exercises, as well as the roles and levels of personnel included in the exercises, may also contribute to the lack of clear metrics.[5] To be effective, drills and exercise-based metrics must be accompanied by clear performance standards and benchmarks.

Savoia et al. developed a valid and reliable self-assessment performance measurement tool for tabletop exercise participants in public health preparedness.[21] Their study focused on public health officials and assessed five public health functional capabilities: leadership and management; mass casualty care; communication; disease control and prevention; and surveillance and epidemiology. The results showed their 37-item performance measurement tool to be reliable at measuring public health functional capabilities in a tabletop exercise setting. Savoia et al. also developed a hospital-based assessment tool to measure hospitals' communication and operational capabilities during an exercise. Their study population involved hospital personnel and assessed three hospital functional capabilities of: interagency communications; communication with the public; and disaster operations. The results showed their 22-item instrument to be reliable for measuring hospital capabilities.[22]

Due to the variety of tools and assessments available to healthcare systems and public health entities, it can be difficult to assess the state of readiness nationally. The National Health Security Preparedness Index (NHSPI) aims to provide a national snapshot of the country's preparedness efforts. This index can be an important tool to assess readiness via determining the "nation's progress in preparing for, preventing, and responding to potential health incidents."[10]

The Healthcare System Readiness Committee will review these assessment tools and determine if they are an appropriate approach to assessing quality, or if other methods may exist or could be developed to assess performance on drills or the quality of a response.

Lessons Learned or Best Practices

A great deal of literature exists on preparedness, response, and recovery, but most of the literature is specific to individual events, focused on public health as opposed to healthcare readiness, and was determined not to be directly relevant to this project. However, the scan identified seven directly relevant articles and issue briefs on best practices or approaches to preparedness, response, and recovery that have direct relevance to quality measurement in readiness. Table 3 shows key themes from each article. These articles provide perspectives on a variety of different populations including behavioral health, rural health, community engagement, and private- and public-sector partnerships. The source most relevant to readiness and the work of this project is the proceedings from a National Academy of Medicine two-day workshop entitled Engaging the Private-Sector Health Care System in Building Capacity to Respond to Threats to the Public's Health and National Security: Proceedings of a Workshop.[23]

TABLE 3. LESSONS AND BEST PRACTICES

Publication Title	Key Themes
Assessing the Threat of Bioterrorism: Are We Ready?[24]	Federal preparedness; state and local infrastructure; congressional acts to improve preparedness; supplementing the pharmaceutical stockpile; regulatory and legal policies
Challenge of Hospital Emergency Preparedness: Analysis and Recommendations[25]	Inconsistent emergency preparedness across the hospital industry; potential motivational factors that encourage effective emergency management and the obstacles that may impede it; strategies to promote consistent, reproducible, and objectively measured preparedness across the U.S. healthcare industry
Community Engagement: Leadership Tool for Catastrophic Health Events[26]	Working Group on Community Engagement in Health Emergency Planning's recommendations to government decision makers on why and how to catalyze the civic infrastructure for an extreme health event
Doing Good by Playing Well with Others: Exploring Local Collaboration for Emergency Preparedness and Response[27]	To support the need for greater collaboration at the local level among healthcare facilities, public health agencies, emergency medical services, and emergency management agencies. A multiphase, mixed-method, qualitative study was conducted to uncover the extent and quality of existing collaborations, identify what factors impede or facilitate the integration of the preparedness community, and propose measures to strengthen collaboration
Rural Mass Casualty Preparedness and Response: The Institute of Medicine's Forum on Medical and Public Health Preparedness for Catastrophic Events[28]	This report identifies gaps in rural infrastructure that challenge mass casualty incident (MCI) response and potential mechanisms to fill them. The report summarizes the presentations and discussions around six major issues specific to rural MCI preparedness and response: 1. improving rural response to MCI through improving daily capacity and capability, 2. leveraging current and emerging technology to overcome infrastructure deficits, 3. sustaining and strengthening relationships, 4. developing and sharing best practices across jurisdictions and sectors, 5. establishing metrics research and development, and 6. fostering the need for federal leadership to expand and integrate EMS into a broader rural response framework.
The Integration of Mental and Behavioral Health into Disaster Preparedness, Response, and Recovery[29]	Assessment on the progress of the U.S. Department of Health and Human Services (HHS) in integrating mental and behavioral health into disaster and emergency preparedness and response activities. Integration of mental and behavioral health into disaster preparedness, response, and recovery requires it to be incorporated in assessments and services, addressed in education and training, and founded on and advanced through research.
Exploring the Predictors of Organizational Preparedness for Natural Disasters.[30]	Study to assess predictors of preparedness at the organizational level. Results show that organization size (facility level) is a consistent predictor of preparedness at the organizational level.
Engaging the Private-Sector Health Care System in Building Capacity to Respond to Threats to the Public's Health and National Security: Proceedings of a Workshop[23]	Presentations and discussion summarized from workshop designed to identify and understand approaches to aligning healthcare system incentives with the American public's need for a healthcare system that is prepared to manage acutely ill and injured patients during a disaster, public health emergency, or other mass casualty event

Individually, none of these reports directly speak to how to measure the quality of healthcare system readiness; however, some do provide insights on predictors of organizational-level preparedness that could be used to develop quality measures. In addition, many focus on some of the challenges in readiness that exist as barriers to the science of measurement, as well as the broader incentives that will be required to enhance public-private partnerships, collaboration among stakeholders, and integration of specific needs (i.e. mental health; rural considerations).

Existing Readiness Metrics and Measure Concepts

The expectation is that during a public health emergency or disaster that "the right people will do the right things in the right way in the right place at the right time and using the right scale."[31] However, when that does not happen, measures and guidance related to health system readiness during an event are created post-event and is done in an episodic manner. Due to the heterogeneity of all possible types of public health emergencies and disasters, existing metrics tend to be either very generic or very specific. Based on NQF's search, there were no specific readiness metrics available. Most measures are presented as concepts or guidance on steps and activities that are integral to being prepared from a health system perspective. Metrics used to assess preparedness are usually created using a top down methodology where local and state entities develop community-specific measures and activities based on federal guidance and support.

The measure-focused search and review resulted in a series of NQF-endorsed and nonendorsed measures that focus on preparedness (**Appendix C**). In addition, measure concepts that were discussed previously in the REMCS report and are relevant to this work can be found in **Appendix E**.

GAPS AND CHALLENGES

The need to define and establish parameters of readiness-related concepts is necessary since the existence of multiple definitions can lead to confusion, which ultimately hinders readiness measurement. The concepts of readiness and preparedness have many interpretations including some where readiness includes both response and recovery. This all-encompassing umbrella definition allows for the inclusion of disparate yet related activities such as communication, information sharing, coordination of operations across health systems, training and education, creating operating plans and division of activities, continuity of normal operations along with response and recovery efforts, resource availability and distribution during emergencies/disaster response. Experts and the healthcare field can further benefit from a framework that brings together all of the potential readiness-related activities into one organizing framework.

Gaps in measurement of preparedness and response continue. The 2012 REMCS report included a series on recommended input and output metrics, including daily input volume at both community and regional levels and downstream placement to psychiatric beds or nursing homes. Such metrics have not yet been developed. In addition, recommended measures identified as candidates to assess preparedness and response, such as NQF #1909 *Medical Home System Survey,* have not been adapted for broader healthcare system accountability. Metrics of shared accountability continue to be challenging to develop and deploy despite agreement that regional-level performance measures should hold both hospitals and other healthcare entities accountable for their peers' performance as well as their own. While there are existing public health emergency preparedness frameworks, such as the Common Ground preparedness framework, there is a lack of emphasis on healthcare system readiness that includes public- and private-sector partnerships. Individual and shared responsibility of readiness efforts among public and private stakeholders continue to challenge accountability.

Based on the working definitions of preparedness and readiness presented in this document, preparedness may be associated with creating processes and structures that help foster readiness which in turn may be interpreted as the outcome of being prepared. The concept of readiness is thus outcome focused. By virtue of this distinction, preparedness and readiness follow the Donabedian framework of structure, process, and outcome.[32] The development of the framework will draw heavily from this connection of structure, process, and outcome as a foundation for the healthcare system readiness framework.

NEXT STEPS

Based on the findings from this scan, many of the recommendations from the 2012 REMCS report are still relevant with respect to healthcare system readiness. The Donabedian model continues to provide a conceptual framework for measurement specific to healthcare system readiness in which we may adapt the traditional structure-process-outcome model to structures-capacities-capabilities for healthcare system readiness. There are, however, no clear, existing frameworks for healthcare system readiness; therefore, it is likely that a framework for this project will need to be developed from scratch. Additional findings from the scan indicate that guidelines are based mostly on core concepts or broad recommendations, but may provide topic areas for developing measures in the future. Assessment tools identified in the scan may offer an appropriate approach to assessing quality. Finally, literature, or findings from after-action reports, on best practices and lessons learned may provide insights on predictors of organization-level readiness that could be used to develop quality measures, as no quality measures currently exist for readiness.

It will be important for the Panel to consider the following framing questions as they commence development of the measurement framework:

- What outcome is expected if readiness is improved or effective? (adequate surge capacity, vulnerable patients identification, availability of critical drugs, low rates of avoidable deaths)
- What evidence-based processes exist that impact desired outcomes?
- What types of tools or methods may be used or adapted to create measures?

In addition, as the measurement framework is developed, it will be important for the Panel to:

- consider other multidisciplinary models, such as the trauma system model, that have had success in aligning partnerships that cross health system boundaries;
- identify existing data that may support measurement, such as CMS patient-level data, to identify vulnerable patients (e.g., medical devices, oxygen and other supplies) or other information such as nursing homes listings, or tabletop and drill exercise results;
- refine the working definition of health system to identify all organization types and associated metrics for a framework (e.g., hospitals, long-term care, urgent care, home and community-based services); and
- identify existing programs to improve readiness such as ASPR's Regional Disaster Health Response System initiative that may be leveraged for adoption of the framework.

During the October 11, 2018 webinar with the Healthcare System Readiness Expert Panel, the group reiterated the dearth of available metrics for capturing readiness. They did note that successful models do exist but they are event specific and/or lack the ability to bridge the gap between planning and actual response. During the discussion, the group identified the following themes as important considerations with respect to healthcare system readiness:

- Time, cost, and cultural issues related to undertaking readiness activities
- Addressing the patient perspective and capturing patient-reported outcomes related to readiness
- Focusing on community-level issues such as care coordination, the disabled population, home-based services, and accessibility
- Provider and responder training, fatigue, and safety

- Threshold for implementing preparedness training
- Readiness for truly unexpected events and mass casualties
- Inclusion of community resources such as Federally Qualified Health Centers in preparedness plans since they can help alleviate overflow and surge capacity issues at the hospital level.

In general, the group agreed that accreditation-related requirements such as The Joint Commission's Emergency Management Standards do not denote levels of readiness and that efforts need to focus on staff, systems in place, supplies/resources, and the community.

REFERENCES

1 The Robert Wood Johnson Foundation. *The National Health Security Preparedness Index: Summary of Key Findings.*; 2017. https://nhspi.org/wp-content/uploads/2017/08/NHSPI2017_Key-Findings_8_10.pdf. Last accessed June 2018.

2 Centers for Medicare and Medicaid Services (CMS). Medicare and Medicaid Programs; Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers. https://www.federalregister.gov/documents/2016/09/16/2016-21404/medicare-and-medicaid-programs-emergency-preparedness-requirements-for-medicare-and-medicaid. Last accessed July 2018.

3 The Joint Commission. *Emergency Management in Health Care, Third Edition*. Oak Brook, Illinois: The Joint Commission; 2016. https://www.jcrinc.com/emergency-management-in-health-care-third-edition/. Last accessed September 2018.

4 Lazar EJ, Cagliuso NV, Gebbie KM. Are we ready and how do we know? The urgent need for performance metrics in hospital emergency management. *Disaster Med Public Health Prep*. 2009;3(1):57-60.

5 Nelson C, Lurie N, Wasserman J. Assessing public health emergency preparedness: concepts, tools, and challenges. *Annu Rev Public Health*. 2007;28:1-18.

6 National Quality Forum. *Regionalized Emergency Medical Care Services: Emergency Department Crowding and Boarding, Healthcare System Preparedness and Surge Capacity - Performance Measurement Gap Analysis and Topic Prioritization*. Washington, DC: National Quality Forum; 2012. http://www.qualityforum.org/Publications/2012/12/REMCS__Emergency_Department_Crowding_and_Boarding,_Healthcare_System_Preparedness_and_Surge_Capacity.aspx. Last accessed September 2017.

7 Gibson PJ, Theadore F, Jellison JB. The common ground preparedness framework: a comprehensive description of public health emergency preparedness. *Am J Public Health*. 2012;102(4):633-642.

8 Federal Emergency Management Agency (FEMA). National Planning Frameworks website. https://www.fema.gov/national-planning-frameworks. Last accessed October 2018.

9 HHS. National Health Security Strategy and Implementation Plan website. https://www.phe.gov/Preparedness/planning/authority/nhss/Pages/strategy.aspx. Last accessed July 2018.

10 The Robert Wood Johnson Foundation. National Health Security Preparedness Index website. NHSPI. https://nhspi.org/. Last accessed October 2018.

11 Centers for Disease Control and Prevention (CDC). Public Health Preparedness Capabilities: National Standards for State and Local Planning. https://www.cdc.gov/phpr/readiness/capabilities.htm. Published 2011. Last accessed July 2018.

12 Barnett DJ, Balicer RD, Blodgett D, et al. The application of the Haddon matrix to public health readiness and response planning. *Environ Health Perspect*. 2005;113(5):561-566.

13 Stoto MA, Nelson C, Savoia E, et al. A public health preparedness logic model: assessing preparedness for cross-border threats in the European region. *Health Secur*. 2017;15(5):473-482.

14 Birnbaum ML, Daily EK, O'Rourke AP, et al. Research and evaluations of the health aspects of disasters, part II: the Disaster Health Conceptual Framework revisited. *Prehospital Disaster Med*. 2015;30(5):523-538.

15 HHS. Public health emergency website. https://www.phe.gov/about/aspr/pages/default.aspx. Last accessed October 2018.

16 Centers for Disease Control and Prevention (CDC). Emergency preparedness and response website. https://emergency.cdc.gov/index.asp. Last accessed October 2018.

17 Departments of Defense, Health and Human Services, Homeland Security, and Agriculture. *National Biodefense Strategy 2018*. Washington, DC: The White House; 2018. https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Biodefense-Strategy.pdf.

18 Emergency Medical Services for Children Innovation and Improvement Center (EMSC IIC). Pediatric Readiness Toolkit website. https://emscimprovement.center/projects/pediatricreadiness/readiness-toolkit/. Last accessed October 2018.

19 Asch SM, Stoto M, Mendes M, et al. A review of instruments assessing public health preparedness. *Public Health Rep Wash DC 1974*. 2005;120(5):532-542.

20 Heidaranlu E, Ebadi A, Khankeh HR, et al. Hospital disaster preparedness tools: a systematic review. *PLoS Curr*. 2015;7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4575155/. Last accessed October 2018.

21 Savoia E, Testa MA, Biddinger PD, et al. Assessing public health capabilities during emergency preparedness tabletop exercises: reliability and validity of a measurement tool. *Public Health Rep Wash DC 1974*. 2009;124(1):138-148.

22 Savoia E, Biddinger PD, Burstein J, et al. Inter-agency communication and operations capabilities during a hospital functional exercise: reliability and validity of a measurement tool. *Prehospital Disaster Med*. 2010;25(1):52-58.

23 National Academies of Sciences, Engineering, and Medicine. *Engaging the Private-Sector Health Care System in Building Capacity to Respond to Threats to the Public's Health and National Security: Proceedings of a Workshop*. Washington, DC: The National Academies Press; 2018. https://www.nap.edu/read/25203/chapter/1. Last accessed September 2018.

24 Keenan PS, Kline J. Assessing the threat of bioterrorism: are we ready? *Issue Brief Commonw Fund*. 2002;(535):1-8.

25 Barbera JA, Yeatts DJ, Macintyre AG. Challenge of hospital emergency preparedness: analysis and recommendations. *Disaster Med Public Health Prep*. 2009;3(S1):S74-S82.

26 Schoch-Spana M, Franco C, Nuzzo JB, et al. Community engagement: leadership tool for catastrophic health events. *Biosecurity Bioterrorism Biodefense Strategy Pract Sci*. 2007;5(1):8-25.

27 Toner ES, Ravi S, Adalja A, et al. Doing good by playing well with others: exploring local collaboration for emergency preparedness and response. *Health Secur*. 2015;13(4):281-289.

28 Viswanathan KP, Bass R, Wijetunge G, et al. Rural mass casualty preparedness and response: the Institute of Medicine's Forum on Medical and Public Health Preparedness for Catastrophic Events. *Disaster Med Public Health Prep*. 2012;6(3):297-302.

29 Pfefferbaum B, Flynn BW, Schonfeld D, et al. The integration of mental and behavioral health into disaster preparedness, response, and recovery. *Disaster Med Public Health Prep*. 2012;6(1):60-66.

30 Sadiq A-A, Graham JD. Exploring the predictors of organizational preparedness for natural disasters. *Risk Anal*. 2016;36(5):1040-1053.

31 McCabe OL, Barnett DJ, Taylor HG, et al. Ready, willing, and able: a framework for improving the public health emergency preparedness system. *Disaster Med Public Health Prep*. 2010;4(2):161-168.

32 Donabedian A. *Explorations in Quality Assessment and Monitoring Vol. 1. The Definition of Quality and Approaches to Its Assessment*. Ann Arbor, MI: Health Administration Press; 1980.

33 Federal Emergency Management Agency (FEMA). Emergency Management Institute website search for "four phases of emergency management." https://search.usa.gov/search?affiliate=netc&query=four+phases+of+emergency+management&op=Search. Last accessed September 2018.

34 National Quality Forum. *A Roadmap for Promoting Health Equity and Eliminating Disparities: The Four I's for Health Equity*. Washington, DC: National Quality Forum; 2017.

35 Inter-American Association of Sanitary and Environmental Engineering (AIDAS), Pan American Health Organization (PAHO). *Glossary. In: Emergencies and Disasters in Drinking Water Supply and Sewerage Systems: Guidelines for Effective Response*. http://helid.digicollection.org/en/d/Js2919e/9.html#Js2919e.9. Last accessed September 2018.

36 North Atlantic Treaty Organization Euro-Atlantic Disaster Response Coordination Centre (NATO EADRCC). Standard Operating Procedures for the Euro-Atlantic Disaster Response Coordination Centre website. https://www.nato.int/eadrcc/sop/sop_eadrcc/sop_eadrcc.htm. Last accessed September 2018.

APPENDIX A:
Operational Definitions

All Hazards:[33] Natural, technological, or human-caused incidents that warrant action to protect life, property, environment, and public health or safety, and to minimize disruptions of school activities.

Disaster:[33] An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries.

Emergency:[33] Any incident, whether natural, technological, or human-caused, that requires responsive action to protect life or property.

Hazard:[33] Something that is potentially dangerous or harmful, often the root cause of an unwanted outcome.

Incident:[33] An occurrence, natural or human-caused, that requires a response to protect life or property.

Measure concept:[34] An idea for a measure (or a description of an existing or potential assessment tool or instrument) that includes a description of the measure, including planned target and population.

Performance measure:[34] A fully developed metric that includes detailed specifications and may have undergone scientific testing.

Preparedness:[35] The organization, education, and training of the population and all relevant institutions to facilitate effective control, early warning, evacuation, rescue, relief and assistance operations in the event of a disaster or emergency. Preparedness encompasses processes and structures that organize resources, policies, procedures and drills to prepare for sudden unforeseen events.

Readiness: The ability of hospitals, healthcare systems, and communities to rapidly identify, evaluate and react to a wide spectrum of emergency conditions. Being fully prepared for an unforeseen event such as an emergency and/or hazardous situation. Literature defines readiness as a composite construct where all parties involved such as individuals, agencies, and organizations are available and prepared for prompt action, service or duty and possess all human and material resources necessary for timely responses.[31]

Recovery:[33] A specific set of procedures that are taken to return to a normal or a safer situation post-disaster and takes place post emergency.

Response:[36] A sum of decisions and actions taken during and after disaster, including immediate relief, rehabilitation, and reconstruction. Essentially, response is operationalizing and putting preparedness plans into action.[33]

APPENDIX B:
Environmental Scan

NQF conducted a review of key terms related to healthcare system readiness by using resources such as PubMed, as well as grey literature and web searches through Google to identify reports, white papers, and other documentation related to healthcare system readiness. In addition, NQF used the following literature and information to inform the environmental scan:

- Review of NQF's portfolio of endorsed measures
- Review of the CMS Measures Inventory, including measures under development
- Review of the Healthcare Effectiveness Data and Information Set (HEDIS)
- Disaster and Response Standards / Frameworks / Guidelines
  - CMS Emergency Preparedness Rule
  - The Joint Commission – Disaster Preparedness and Response for Hospitals
  - CDC – public health
  - Department of Veterans Affairs Comprehensive Emergency Management Program (CEMP)
  - ASPRs Health Care Preparedness and Response Capabilities – Healthcare Coalitions metrics (Hospital Preparedness Program).
  - Integrated healthcare system – Kaiser, etc.
  - FEMA
- CMS Resources:
  - Data – if available from CMS' Emergency Preparedness Rule https://www.cms.gov/Medicare/Provider-Enrollment-and-certification/SurveyCertEmergPrep/Emergency-Prep-Rule.html
  - CMS Emergency Preparedness Training Online Course: https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertEmergPrep/Downloads/CMS-Online-Training-for-Emergency-Preparedness.pdf
- Other grey literature (i.e., academic or policy literature that is not commercially published):
  - Government publications (e.g., Congressional reports, federal or state agency reports, rules and regulations, etc.)
  - Reports or publications from foundations, associations, or nonprofit groups (e.g., Commonwealth Fund, Kaiser Family Foundation, AcademyHealth, The Joint Commission, medical/healthcare associations, or specialty societies, etc.)
  - Conference papers, abstracts, or proceedings
  - Previous NQF reports

NQF used the parameters defined in Table B1 to narrow the search. A cutoff of 2001 was selected because the events of 9/11 significantly altered the emergency preparedness arena. Since this work builds on the work done in the 2012 REMCS report, the focus for articles from 2001 to 2012 (was solely on readiness. NQF focused on readiness and preparedness for articles published after 2012.

NQF used specific "terms" or "strings" to search for information sources. As additional information was gathered, NQF revisited and refined the list of terms as appropriate. For the environmental scan of measures, these terms may be combined with terms like "measure," "metric," "standard," "survey," "scale," "quality," etc. The terms were:

- Capacity Building
- Disaster Planning
- Emergencies
- Emergency Responders
- Health Services Needs and Demand

TABLE B1. SEARCH PARAMETERS

Included	Excluded
• Developed or published after 2001 OR originally published prior to 2001 and still current • Measures that include specifications that meet the operational definitions of healthcare system readiness • Instruments, scales, survey tools, and surveys	• Published before 2001 and not current • Not available in English

APPENDIX C:
Initial List of Potential Quality Measures Related to Readiness

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	AAR/IPs developed following an exercise or real incident. After Action Reports/ Improvement Plans (ARR/IPs)	Process	The intent of this performance measure is to demonstrate the capability to analyze response actions, describe needed improvements, and prepare a plan for making improvements. States and localities are required to report details on a minimum of two AAR/IPs. States and localities can report an unlimited number of AAR/IPs, but can only provide details for a maximum of 12 for the entire year (a maximum of six for each of the two reporting periods within the entire year). This CDC report provides information on the detailed AAR/IPs. States and localities may have developed additional AAR/IPs.	CDC
	AAR/IPs developed within target time of 60 days	Process	Development of an AAR/IP within 60 days is calculated using the date following the end of the exercise or public health emergency response operations as determined by the incident commander, and the date the draft AAR/IP was submitted for clearance within the public health agency.	CDC
	Ability of the CDC PHEP-funded Laboratory Response Network chemical (LRN-C) laboratories to collect relevant samples for clinical chemical analysis, package, and ship those samples	Process	Perform sample management	CDC
	Access to Care	Process	Enrollee experience related to the following: Got care for illness/injury as soon as needed Got non-urgent appointment as soon as needed Based on CAHPS Health Plan 5.0 Easy to get care after regular office hours How often it was easy to get necessary care, tests, or treatment Got appointment with specialists as soon as needed. The QRS Access to Care measure includes two separate NQF-endorsed measures (Getting Needed Care and Getting Care Quickly) along with an additional CAHPS Health Plan Supplemental question regarding getting after-hours care. Based on CAHPS Health Plan 5.0 and CAHPS Health Plan 5.0-Supplemental Item	Agency for Healthcare Research and Quality (AHRQ)

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Access to medical equipment	Outcome	This measure assesses the percentage of individuals needing medical equipment for a health problem, who indicated that it was easy to get or replace the medical equipment through their health plan during the last six months. The measure is based on responses to optional supplemental survey items used in the Consumer Assessment of Healthcare Providers and Systems (CAHPS) for Health Plans (adults), Medicare Advantage (MA) and Prescription Drug Plans (PDP) - currently, these supplemental items are required only when the survey is fielded amongst Medicare-Medicaid (MMP) plans.	Mathematica
	Access to Specialists	Patient Reported Outcome	The CAHPS for ACOs survey includes core questions from version 2.0 of the CG CAHPS survey and supplemental items from sources including the CAHPS Patient Centered Medical Home Survey, Core CAHPS Health Plan Survey Version 5.0, existing CAHPS supplemental items, and new content written for the CAHPS for ACOs survey.	AHRQ
	Acute Care Hospitalization (Claims Based)	Outcome	Percentage of home health stays in which patients were admitted to an acute care hospital during the 60 days following the start of the home health stay.	Centers for Medicare and Medicaid Services (CMS)
	Acute Care Hospitalization (OASIS Based)	Outcome	Percentage of home health episodes of care that ended with the patient being admitted to the hospital.	CMS
0497 (Endorsed)	Admit decision time to ED departure time for admitted patients	Process	Median time from admit decision time to time of departure from the emergency department for emergency department patients admitted to inpatient status	CMS

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Biological Monitoring of Terrorism Agents develop new methods for evaluating internal doses following a terror event.	Process	These methods would reduce the number of workers affected since more rapid and accurate identification of those with significant absorption of the terror agent would occur, and appropriate treatment would be instituted for those who need it. In addition, such methods would permit better monitoring of the effectiveness of exposure protections and more precise identification of those needing further medical follow-up or monitoring. Strategic Goal: Emergency response and remediation workers will reduce the potential impact of exposures to terror agents by utilizing improved biological monitoring methods. Discussion: When a terror event occurs, the causative agent, whether chemical, biological, or radiologic/nuclear, needs to be quickly identified and exposures assessed. At times, the terror event may entail multiple agents released either simultaneously or sequentially. Better methods to identify absorbed chemical or biological agents and to quantify internal exposure are needed. In particular, rapid methods for measuring what or how much agent is actually absorbed into the body using various biomonitoring techniques would be beneficial, especially when clinical evaluation is needed. Cumulative exposures to chemical agents (and perhaps some biological agents) at levels insufficient to produce acute symptoms or illness may over time lead to frank disease or other adverse health effects, and biomonitoring is an important tool for early identification and monitoring of such exposures. Additionally, vaccination can augment protection against some biothreat agents. Successful vaccination results in measurable antibody titers. Exposure to biothreat agents also can induce natural immunity, which can serve as a biological marker of remote or recent exposure. Critical gaps exist in the efficient measurement of antibodies to numerous biothreat agents, as existing methods can measure only one analyze per assay.	CDC-NIOSH

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Care Coordination	Patient Engagement/ Experience	Enrollee experience related to the following: Doctor seemed informed and up-to-date about care from other health providers Doctor had your medical records Doctor followed up about blood test, x-ray results Got blood test, x-ray results as soon as you needed them Doctor talked about prescription drugs you are taking Got help you needed from doctor s office manage your care among different providers CAHPS Health Plan 5.0- Supplemental Items	CMS
	Characterization/ Assessment of Potential Hazards: Overall Performance Goal: Reduce the incidence and severity of injuries and illnesses through improved and more rapid characterization/ assessment of potential hazards.	Outcome	Develop new methods for identifying environmental contamination in case of a terror event. These methods would reduce the number of workers exposed and injured since more rapid identification of the terror agent would occur and the appropriate protection, workplace controls would be instituted.	CDC-NIOSH
	Communication between PHEP-funded Laboratory and Sentinel Clinical Laboratories Bio Only	Process	Time for sentinel clinical laboratories to acknowledge receipt of an urgent message from PHEP-funded laboratory. Measurement Specifications: Start time: Time PHEP-funded laboratory sends urgent message to first sentinel clinical laboratory. Intermediate stop time 1: Time at least 50% of sentinel clinical laboratories acknowledged receipt of urgent message. Intermediate stop time 2: Time at least 90% of sentinel clinical laboratories acknowledged receipt of urgent message. Stop time: Time last sentinel clinical laboratory acknowledged receipt of urgent message	CDC
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Activate dispensing modalities	CDC
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Dispense medical countermeasures to identified population	CDC
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Direct and activate medical material management and distribution	CDC
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Acquire medical material	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Maintain updated inventory management and reporting system	CDC
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Establish and maintain security	CDC
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Distribute medical material	CDC
	Composite performance indicator from the Division of Strategic National Stockpile in CDC's Office of Public Health Preparedness and Response	Process	Recover medical material and demobilize distribution operations	CDC
	Comprehensive assessment for patients with complex needs	Process	Percent of beneficiaries with complex care coordination needs who received a comprehensive assessment including documentation of beneficiary goals.	NCQA
	Conducted at least one unannounced activation	Process	States and localities must be able to demonstrate that all eight core ICS functional role scan be staffed rapidly outside of normal business hours without advance warning.	CDC
	Conducted at least one unannounced notification outside of normal business hours	Process	States and localities must be able to demonstrate that all eight core ICS functional roles can be staffed rapidly outside of normal business hours without advance warning.	CDC
	CP – Identification of key organizations Annual	Process	Median number of community sectors in which local health departments (LHDs) identified key organizations to participate in public health, medical, and/or mental/ behavioral health-related emergency preparedness efforts. Measurement Specifications: When the numbers of community sectors engaged by each participating LHD are arranged from highest to lowest [maximum is 11, minimum is zero], the median is the midpoint number where half of the LHDs engaged a number of sectors at or above the midpoint and the other half of the LHDs engaged a number of sectors at or below it.	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	CP – Community engagement in risk identification Annual	Process	Median number of community sectors that LHDs engaged in using hazards, and vulnerabilities assessment (HVA) data to determine local hazards, vulnerabilities, and risks that may impact public health, medical, and/or mental/behavioral health systems and services. Measurement Specifications: When the numbers of community sectors that each LHD engaged to determine local hazards, vulnerabilities, and risks are arranged from highest to lowest [maximum is 11, minimum is zero], the median is the midpoint number where half of the LHDs engaged a number of sectors at or above the midpoint and the other half of the LHDs engaged a number of sectors at or below it.	CDC
	CP – Community engagement in public health preparedness activities Annual	Process	Proportion of key organizations that LHDs engaged in a significant public health emergency preparedness activity. Measurement Specifications: Numerator: Number of key organizations that LHDs engaged in one or more of the following significant public health emergency preparedness activities: Development of key organizations' emergency operations or response plans related to public health, medical, and/or mental/behavioral health Exercises containing objectives or challenges (e.g. injects) related to public health, medical, and/or mental/behavioral health. Competency-based training related to public health, medical, and/ or mental/behavioral health emergency preparedness and response. Denominator: Total number of key organizations identified by LHDs (as specified in data element #2 for CP 1)	CDC
	CP – Community engagement in recovery planning Annual	Process	Median number of community sectors that LHDs engaged in developing and/ or reviewing a community recovery plan related to the restoration and recovery of public health, medical, and/or mental/ behavioral health systems and services. Measurement Specifications: When the numbers of community sectors that each LHD engaged in developing and/ or reviewing their community recovery plan are arranged from highest to lowest [maximum is 11, minimum is zero], the median is the midpoint number where half of the LHDs engaged a number of sectors at or above the midpoint and the other half of the LHDs engaged a number of sectors at or below it.	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
0498 (Not Endorsed)	Door to Diagnostic Evaluation by a Qualified Medical Personnel	Process	Time of first contact in the ED to the time when the patient sees qualified medical personnel for patient evaluation and management	Louisiana State University
	EI – Exposure Investigation Reports Annual	Process	Percentage of EI of acute environmental exposures that generate reports. Measurement Specifications: Numerator: Number of EI reports of acute environmental exposures generated. Denominator: Number of EI of acute environmental exposures	CDC
	EI – Exposure Reports with Minimal Elements Annual	Process	Percentage of EI reports of acute environmental exposures that contain all minimal elements. Measurement Specifications: Numerator: Number of EI reports of acute environmental exposures containing all minimal elements. Denominator: Number of EI reports of acute environmental exposures generated	CDC
	EI – Outbreak Investigation Reports Annual	Process	Percentage of infectious disease outbreak investigations that generate reports. Measurement Specifications: Numerator: Number of infectious disease outbreak investigation reports generated. Denominator: Number of infectious disease outbreaks investigated	CDC
	EI – Outbreak Reports with Minimal Elements Annual	Process	Percentage of infectious disease outbreak investigation reports that contain all minimal elements. Measurement Specifications: Numerator: Number of infectious disease outbreak investigation reports containing all minimal elements. Denominator: Number of infectious disease outbreak reports generated	CDC
0291 (Endorsed)	Emergency Department Transfer Communication Measure(EDTC)	Process	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that REQUIRED information was communicated to the receiving facility prior to departure OR WITHIN 60 MINUTES OF TRANSFER	University of Minnesota Rural Health Research Center
	Emergency Department Use with Hospitalization (OASIS Based)	Outcome	Percentage of home health episodes of care during which the patient needed urgent, unplanned medical care from a hospital emergency department, immediately followed by hospital admission.	CMS
	Emergency Department Utilization	Process	For members 18 years of age and older, the risk-adjusted ratio of observed to expected emergency department (ED) visits during the measurement year	NCQA

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Emergency Medical Services	Process	Composite: Average Response Time, Number of available hospital/clinic beds, Number of medical personnel (per thousand population)	University of Louisville
	Emergent Care for Injury Caused by Fall	Outcome	Percentage of patients who need urgent, unplanned medical care due to an injury caused by fall.	CMS
	Engineering/ Technological Interventions and Controls: Overall Performance Measure: Reduce exposure through improved engineering/ technological interventions and controls.	Outcome	Strategic Goal: As appropriate and feasible, improve engineering controls, technology, and tools to reduce responder's exposures to or hazards associated with CBRN, toxic industrial compounds, and other hazardous materials. Discussion: Poor integration of engineering controls during structural design and procedural development usually results in almost total dependence on PPE to minimize exposures or hazards during emergency response operations. Engineering control interventions should be evaluated and implemented, even though complete control of CBRN, toxic industrial compounds, and hazardous exposures may not be possible by engineering controls alone.	CDC-NIOSH
	Ensure that State and District of Columbia health departments establish training, plans, and protocols and conduct annual multi-institutional exercises to prepare for response to natural and technological disasters.	Process	Topic or Condition: Population Sub-Topic or Sub-Condition: Environmental Health Domain: Process Care Setting: Health System Numerator: Number of States including District of Columbia that have established preparedness plans and scheduled exercises Denominator: Not applicable Explanation If No Numerator/ Denominator: Number, not a rate	Department of Health and Human Services - Office of the Assistant Secretary for Health (HHS-OASH)

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Environmental Microbiology: Overall Performance Goal: Improve the ability to evaluate, understand risk of infection, and improve risk reduction strategies for biological threat agents.	Process	Strategic Goal: Emergency response organizations will improve their understanding of environmental microbiology threat agents, including environmental factors that influence the introduction, spread, and control of these agents. Emergency responders will enhance their capability to respond to a biological threat, whether naturally occurring or deliberately introduced. Discussion: Critical gaps exist in our knowledge about environmental microbiology, and these disparities impede the ability of public health responders to take appropriate action in emergency situations that involve microbial agents. Microbial agents are considered to include bioterrorism agents, emerging infectious pathogens, and non-select agents. Establishing the presence and level of threat agents in the environment ideally would be supported by validated and effective sampling, detection, and quantification of the target agents, as well as specific identification of pathogens and their antimicrobial susceptibilities. It is also critical to have the capacity to estimate risk of infection to human populations using data such as number and viability of organisms in an environment, persistence of agents in the environment, dose-infection relationships through various environmental media, and antimicrobial resistance patterns. Finally, it is important to develop and understand the effectiveness of a range of risk reduction strategies for contaminated environments, including environmental controls; personal protective equipment; disinfection strategies; and, when Available and indicated, medical countermeasures like immunization or antimicrobial prophylaxis.	CDC-NIOSH
	EOC – Staff Assembly Annual	Process	Time for pre-identified staff covering activated public health agency incident management lead roles (or equivalent lead roles) to report for immediate duty. Measurement Specification: Start time: Date and time that a designated official began notifying staff to report for immediate duty to cover activated incident management lead roles. Stop time: Date and time that the last staff person notified to cover an activated IM lead role reported for immediate duty.	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	EOC – Priority Goal (50 states only) Annual	Process	Time for pre-identified staff covering activated public health agency incident management lead roles (or equivalent lead roles) to report for immediate duty. Performance Target: 60 minutes. Measurement Specification: Start time: Date and time that a designated official began notifying staff to report for immediate duty to cover activated IM lead roles. Stop time: Date and time that the last staff person notified to cover an activated IM lead role reported for immediate duty.	CDC
	EOC - IAP	Process	Production of the approved Incident Action Plan (IAP) before the start of the second operational period. Measurement Specifications: Was a written IAP approved before the start of the second operational period [Yes/No]?	CDC
	EOC - AAR and IP Annual	Process	Time to complete a draft of an After Action Report (AAR) and Improvement Plan (IP). Measurement Specifications: Start time: Date exercise or public health emergency operation completed (may be prior to or during current BP). Stop time: Date the draft AAR and IP were submitted for clearance within the public health agency.	CDC
	EPIW - Public Message Dissemination	Process	Time to issue a risk communication message for dissemination to the public. Measurement Specifications: Start time: Date and time that a designated official requested that the first risk communication message be developed. Stop time: Date and time that a designated official approved the first risk communication message for dissemination.	CDC
	EUROHIS-QOL	Outcome	The World Health Organization (WHO) developed the WHO Quality of Life (WHOQOL), an international quality of life instrument with scores that are comparable across different cultures. The EUROHIS-QOL is an 8 item version that includes two items from each of the four domains-physical health; psychological health; social relationships; and environment.	Mathematica

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Inpatient Hospital Average Length of Stay (risk adjusted)	Process	Overall inpatient hospital average length of stay (ALOS) and ALOS by medical service category. Numerator: Total number of inpatient days of care for the admissions in the denominator. Denominator: • Denominator 1: Total number of inpatient admissions during the reporting period. • Denominator 2: Total number of inpatient admissions for the selected APR-DRG or DRG service category during the reporting period. oAPR-DRG and DRG service categories: medical, surgical, neonatal intensive care unit, mental health, substance abuse, obstetrics, and transplants (see Table 1 for DRG statistics and service categories).	United Health Group
	Inpatient Hospital Utilization	Process	For members 18 years of age and older, the risk-adjusted ratio of observed to expected acute inpatient discharges during the measurement year reported by Surgery, Medicine, and Total	NCQA
0703 (Not Endorsed)	Intensive Care: In-hospital mortality rate	Outcome	For all adult patients admitted to the intensive care unit (ICU), the percentage of patients whose hospital outcome is death; both observed and risk-adjusted mortality rates are reported with predicted rates based on the Intensive Care Outcomes Model - Mortality (ICOMmort).	Philip R. Lee Institute for Health Policy Studies
	Laboratorian Reporting Bio & Chem	Process	Time for initial laboratorian to report for duty at the PHEP-funded laboratory. Measurement Specifications: Start Time: Date and time that a public health designated official began notifying on-call laboratorian(s) to report for duty at the PHEP-funded LRN laboratory. Stop Time: Date and time that the first laboratorian reported for duty at the PHEP-funded LRN laboratory	CDC
	LRN-EPI 24/7 Emergency Contact Drill Bio & Chem Annual	Process	Time to complete notification between CDC, on-call laboratorian, and on-call epidemiologist Performance Target: 45 minutes. Measurement Specifications: Start Time: Date and time that CDC Emergency Operations Center official began notification to on-call laboratorian. [In BP11, this applies only to LRN-B in this direction.] Stop Time: Date and time on-call epidemiologist (after receiving notification from on-call laboratorian) notifies CDC Emergency Operations Center that notification drill is complete.	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	LRN-EPI 24/7 Emergency Contact Drill Bio & Chem Annual	Process	Time to complete notification between CDC, on-call epidemiologist, and on-call laboratorian Performance Target: 45 minutes. Measurement Specifications: Start Time: Date and time that CDC Emergency Operations Center official began notification to on-call epidemiologist. Stop Time: Date and time on-call laboratorian (after receiving notification from on-call epidemiologist) notifies CDC Emergency Operations Center that notification drill is complete. [In BP11, this applies only to LRN-C in this direction.]	CDC
	LRN Emergency Response Pop Proficiency Test (PopPT) Exercise Chem Only Annual	Process	Ability of PHEP-funded LRN-C Level 1 and/or Level 2 laboratories to detect and quantify biomarkers of chemical agents in clinical samples during the LRN Emergency Response Pop Proficiency Test (PopPT) Exercise. Measurement Specifications: Numerator: Number of biomarkers of chemical agents detected by Level 1 and/or Level 2 laboratories. Denominator: Number of biomarkers of chemical agents in the exercise.	CDC
	Measure 1: Proportion of reports of selected reportable diseases received by a public health agency within the jurisdiction required time frame288	Process	Numerator: Number of reports of selected reportable disease received by a public health agency within the jurisdiction-required time frame Denominator: Number of reports of selected reportable disease received by a public health agency	CDC
	Measure 1: Percentage of infectious disease outbreak investigations302 that generate reports	Process	Numerator: Number of infectious disease outbreak investigation reports generated Denominator: Number of infectious disease outbreak investigation reports investigated	CDC
	Measure 2: Percentage of infectious disease outbreak investigation reports that contain all minimal elements303	Process	Numerator: Number of infectious disease outbreak investigation reports generated containing all minimal elements Denominator: Total number of infectious disease outbreak investigation reports generated	CDC
	Measure 3: Percentage of acute environmental exposure304 investigations that generate reports	Process	Numerator: Number of acute environmental exposure investigation reports generated Denominator: Number of acute environmental exposures investigated	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Measure 4: Percentage of acute environmental exposure reports that contain all minimal elements	Process	Numerator: Number of acute environmental exposure reports generated containing all minimal elements Denominator: Number of acute environmental exposure investigation reports generated	CDC
	Measure 1: Proportion of reports of selected reportable diseases for which initial public health control measure(s) were initiated within the appropriate time frame309	Process	Numerator: Number of reports of selected reportable diseases for which public health control measure(s) were initiated within an appropriate time frame Denominator: Number of reports of selected reportable diseases received by a public health agency	CDC
0496 (Endorsed)	Median time from ED arrival to ED departure for Discharged ED patients	Process	Median time from emergency department arrival to time of departure from the emergency room for patients discharged from the emergency department.	CMS
0495 (Endorsed)	Median time from ED arrival to ED departure for admitted ED patients	Process	Median time from emergency department arrival to time of departure from the emergency room for patients admitted to the facility from the emergency department	CMS
	Medical and public health surge outcome	Process	Percentage of volunteers trained to provide mass prophylaxis (e.g. mass vaccinations or mass antibiotic distribution in the event of a public health emergency)	Centers for Disease Control and Prevention (CDC)
0530 (Endorsed)	Mortality for Selected Conditions	Composite	A composite measure of in-hospital mortality indicators for selected conditions.	AHRQ
	Notification Drill associated with Proficiency Testing Bio Only Annual	Process	Ability of PHEP-funded LRN-B reference laboratory to contact the CDC Emergency Operations Center within 2 hours during LRN notification drill. Measurement Specifications: Notification drill results [Passed/did not pass/did not participate]	CDC
	Notification to Partners Bio & Chem Annual	Process	Time for PHEP-funded laboratory to notify public health partners of significant laboratory results. Measurement Specifications: Start time: Time PHEP-funded laboratory obtains a significant laboratory result. Stop time: Time PHEP-funded laboratory completes notification of public health partners of significant laboratory results (i.e., time when last public health partner was notified, if partners were not simultaneously notified)	CDC
	PCP notification of inpatient admission	Process	Percentage of hospital discharges where the PCP received timely notification of hospital admission.	NCQA

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Percentage of Laboratory Response Network (LRN) clinical specimens without any adverse quality assurance events received at the CDC PHEP- funded LRN-B laboratory for confirmation or rule- out testing from sentinel clinical laboratories	Outcome	Perform sample management	CDC
	Percentage of LRN non-clinical samples without any adverse quality assurance events received at the CDC PHEP-funded LRN-B laboratory for confirmation or rule- out testing from first responders	Outcome	Perform sample management	CDC
	Performance Measure 74 (formerly PM 66c medical)	Outcome	The percent of hospitals recognized through a statewide, territorial, or regional standardized system that are able to stabilize and/or manage pediatric medical emergencies. NUMERATOR: Number of hospitals with an ED that are recognized through a statewide, territorial or regional standardized system that are able to stabilize and/or manage pediatric medical emergencies. DENOMINATOR: Total number of hospitals with an ED in the State/Territory.	EMSC-Emergency Medical Services for Children
	Performance Measure 75 (formerly PM 66c trauma)	Outcome	The percent of hospitals recognized through a statewide, territorial, or regional standardized system that are able to stabilize and/or manage pediatric traumatic emergencies. NUMERATOR: Number of hospitals with an ED that are recognized through a statewide, territorial or regional standardized system that are able to stabilize and/or manage pediatric traumatic emergencies. DENOMINATOR: Total number of hospitals with an ED in the State/Territory.	EMSC-Emergency Medical Services for Children

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Performance Measure 73(formerly PM 66b)	Structure	The percent of patient care units in the state/territory that have essential pediatric equipment and supplies as outlined in national guidelines. NUMERATOR (BLS (basic life support) patient care units): Number of BLS patient care units that have the essential pediatric equipment and supplies according to the data collected. DENOMINATOR (BLS patient care units): Total number of BLS patient care units for which data was collected. NUMERATOR (ALS- Advanced life support- patient care units): Number of ALS patient care units that have the essential pediatric equipment and supplies according to the data collected. DENOMINATOR (ALS patient care units): Total number of ALS patient care units for which data was collected.	EMSC-Emergency Medical Services for Children
	Personal Protective Equipment (PPE): Overall Performance Measure: Reduce the number of injuries and illnesses to first responders as a result of improper selection or use (or non-use) of PPE.	Process	Strategic Goal: Emergency response organizations with responsibilities associated with hazardous materials response will reduce exposures to inhalation and dermal hazards. Discussion: During the earliest phases of response operations, before technical expertise can be brought to bear or supplemental safety equipment can be located, responders and safety managers need guidelines, checklists, or other decision- making tools to assist in developing appropriate initial and reevaluated protection strategies.	CDC-NIOSH
	Physician Information	Process	Percentage of patients transferred to another HEALTHCARE FACILITY whose medical record documentation indicated that physician information was communicated to the receiving FACILITY within 60 minutes of departure	University of Minnesota Rural Health Research Center
	Physician Notification Guidelines Established	Process	Percentage of home health episodes of care in which the physician-ordered plan of care, at start/resumption of care, establishes parameters (limits) for notifying the physician of changes in patient status.	CMS

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
1768 (Endorsed)	Plan All-Cause Readmissions (PCR)	Process	For patients 18 years of age and older, the number of acute inpatient stays during the measurement year that were followed by an unplanned acute readmission for any diagnosis within 30 days and the predicted probability of an acute readmission. Data are reported in the following categories: 1. Count of Index Hospital Stays* (denominator) 2. Count of 30-Day Readmissions (numerator) 3. Average Adjusted Probability of Readmission *An acute inpatient stay with a discharge during the first 11 months of the measurement year (e.g., on or between January 1 and December 1).	NCQA
	Pre-identified staff acknowledged notification within the target time of 60 minutes	Process	This performance measure, related to the measure above, considers the time for staff with public health agency ICS functional responsibilities to acknowledge the notification.	CDC
	Pre-identified staff notified to fill all eight Incident Command System (ICS) core functional roles due to a drill, exercise, or real incident	Process	The intent of this performance measure is to demonstrate the capability to rapidly notify staff with incident management functional responsibilities that the EOC (Emergency Operations Center) is being activated (see Activations below). States and localities are required to report details on a minimum of two notification drills, exercises, or real incidents. States and localities can report an unlimited number of drills, exercises, or real incidents, but can only provide details for a maximum of 12 for the entire year (a maximum of six for each of the two reporting periods within the entire year). This CDC report provides information on the detailed notification drills, exercises, or incidents. States and localities may have conducted additional notifications.	CDC
	Pre-identified staff reported to the public health EOC within the target time of 2.5 hours	Process	This performance measure, related to the measure above, considers the time for staff with public health agency Incident Command System functional responsibilities to report for duty at the public health agency's EOC.	CDC
	Production of the approved Incident Action Plan before the start of the second operational period	Process	Develop incident response strategy	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Proficiency Testing Bio Only Annual	Process	Proportion of LRN-B proficiency tests successfully passed by PHEP-funded laboratories. Measurement Specifications: Numerator: Number of LRN-B proficiency tests successfully passed by PHEP-funded laboratory(ies). Denominator: Total number of LRN-B proficiency tests participated in by PHEP-funded laboratory(ies)	CDC
	Proficiency Testing - Chemical Additional Chem Only Annual	Process	Proportion of LRN-C proficiency tests (additional methods) successfully passed by PHEP-funded laboratory. Measurement Specifications: Numerator: Number of LRN-C additional methods successfully proficiency tested by the PHEP-funded laboratory. Denominator: Total number of LRN-C additional methods for which the PHEP-funded laboratory is qualified to test	CDC
	Proficiency Testing - Chemical Core Chem Only Annual	Process	Proportion of LRN-C proficiency tests (core methods) successfully passed by PHEP- funded laboratory. Measurement Specifications: Numerator: Number of LRN-C core methods successfully proficiency tested by the PHEP-funded laboratory. Denominator: Total number of LRN-C core methods (9)	CDC
	Public health EOC (Emergency Operations Center) activated as part of a drill, exercise, or real incident	Process	The intent of this performance measure is to demonstrate the capability for all eight staff having core ICS functional responsibilities to report for duty at the public health EOC. States and localities are required to report a minimum of two activations. States and localities can report an unlimited number of activations, but can only provide details for a maximum of 12 for the entire year (a maximum of six for each of the two reporting periods within the entire year). This CDC report provides information on the detailed activations. States and localities may have conducted additional activations.	CDC
	Risk-Adjusted Average Length of Inpatient Hospital Stay	Process	Percentage of inpatient & outpatients with excessive in-hospital days. Numerator: Number of excess in-hospital days in a given inpatient population. Denominator: Patients admitted to a hospital. Patient population can be aggregated as any grouping of patients (e.g., by hospital, physician, diagnosis code, procedure, DRG, etc.)	Premier, Inc.
	Re-evaluated response capabilities following approval and completion of corrective actions identified in AAR/Ips	Process	The systematic reevaluation of response capabilities is critical for providing evidence that planned corrective actions have been effective in improving response.	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Safety Climate: Overall Performance Measure: Develop and evaluate a set of new best practices or recommended performance measures to improve the organization of emergency response activities and to promote a pro- active crew-based safety climate. Reduce exposures, illnesses, or injuries attributable to improvements in safety climate	Process	Strategic Goal: Reduce injuries and enhance the health, safety, and resilience of emergency responders by improving the organization of emergency response work. Discussion: Improved preparation, better organization, and more consistent adherence to best practices during emergency operations will minimize exposures, prevent consequent injuries and illnesses, and promote workforce resilience. The overall safety climate in an emergency setting is influenced by many factors, including the nature of the hazards, management practices, crew-based collaboration, communication, preparation, and training, that address all phases of a response, from pre-event preparation to after-action review and treatment.	Centers for Disease Control and Prevention – National Institute for Occupational Safety and Health (CDC-NIOSH)
	Sample Collection, Packing, and Shipping (SCPaS) Chem Only Annual	Process	Ability of PHEP-funded LRN-C laboratory to collect, package, and ship samples properly during LRN exercise. Measurement Specifications: SCPaS Exercise Results [Passed/Did not pass]	CDC
	Sample Quality-First Responders Bio Only Annual	Process	Percentage of LRN nonclinical samples received at the PHEP-funded laboratory for confirmation or rule-out testing from first responders without any adverse quality assurance events. Measurement Specifications: Numerator: Number of LRN nonclinical samples received at the PHEP-funded laboratory for confirmation or rule-out testing from first responders without any adverse quality assurance events. Denominator: Total number of LRN nonclinical samples received at the PHEP-funded laboratory for confirmation or rule-out testing from first responders	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Severity- Standardized Average Length of Stay -- Routine Care (risk adjusted)	Process	Standardized average length of hospital stay (ALOS) for routine inpatient care (i.e., care provided outside of intensive care units). Numerator: Number of accommodation days in Routine Care hospital units for discharges in the denominator. Denominator: Number of inpatient hospital discharges (for respective condition) Inclusions: Global time period = Cases with discharge dates falling within six-month measurement time period Cases meeting global Clinical Criteria for Acute Myocardial Infarction (AMI), Coronary Artery Bypass Graft (CABG), Percutaneous Coronary Intervention (PCI), or Pneumonia, respectively Patients aged 18-64 years at admission Primary source of payment = private/ commercial health insurance plan Cases with Routine Care accommodation Days 0 or more, whole number values, defined by UB-92 revenue codes	Leapfrog Group
	Specimen Quality- Sentinel Clinical Laboratories Bio Only Annual	Process	Percentage of LRN clinical specimens received at PHEP-funded laboratory for confirmation or rule-out testing from sentinel clinical laboratories without any adverse quality assurance events. Measurement Specifications: Numerator: Number of LRN clinical specimens received at PHEP-funded laboratory for confirmation or rule-out testing from sentinel clinical laboratories without any adverse quality assurance events. Denominator: Total number of LRN clinical specimens received at CDC PHEP-funded laboratory for confirmation or rule-out testing from sentinel clinical laboratories	CDC
1463 (Endorsed)	Standardized Hospitalization Ratio (SHR) for Dialysis Facilities	Outcome	Standardized hospitalization ratio for dialysis facility patients. This measure is calculated as a ratio but can also be expressed as a rate.	CMS
0369 (Endorsed)	Standardized Mortality Ratio for Dialysis Facilities	Outcome	Standardized mortality ratio for dialysis facility patients. This measure is calculated as a ratio but can also be expressed as a rate.	CMS

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
2496 (Endorsed)	Standardized Readmission Ratio (SRR) for dialysis facilities	Outcome	The Standardized Readmission Ratio (SRR) is defined to be the ratio of the number of index discharges from acute care hospitals that resulted in an unplanned readmission to an acute care hospital within 4-30 days of discharge for Medicare-covered dialysis patients treated at a particular dialysis facility to the number of readmissions that would be expected given the discharging hospitals and the characteristics of the patients as well as the national norm for dialysis facilities. Note that in this document, "hospital" always refers to acute care hospital.	CMS
	surge capacity: beds	Structure	Number of additional beds for which a recipient could make patient care available within 24 hours	Health Resources and Services Administration (HRSA)
	Surge Capacity Exercise Chem Only Annual	Process	Ability of each PHEP-funded LRN-C Level 1 laboratory to process and report results to CDC for 500 samples during the LRN Surge Capacity Exercise. Measurement Specifications: Start Time: Date and time of delivery of 500 samples to LRN-C Level 1 laboratory. Stop Time: Date and time result from last sample was reported to CDC	CDC
	SURV – Disease Control Annual	Process	Proportion of reports of selected reportable diseases for which initial public health control measure(s) were initiated within the appropriate timeframe. Measurement Specifications: Numerator: Number of reports of selected reportable diseases for which public health control measure(s) were initiated within an appropriate timeframe. Denominator: Number of reports of selected reportable diseases received by a public health agency	CDC
	SURV – Disease Reporting Annual	Process	Proportion of reports of selected reportable diseases received by a public health agency within the awardee-required timeframe. Measurement Specifications: Numerator: Number of reports of selected reportable disease received by a public health agency within the awardee-required timeframe. Denominator: Number of reports of selected reportable disease received by a public health agency	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
	Surveillance: Overall performance measure: Reduce the development of illnesses or injuries attributable to occupational exposure during disaster response through the use of prevention tools developed from information from short and long-term surveillance reporting systems.	Outcome	Strategic Goal: Emergency response organizations will use the results from analyses of data from a surveillance system(s) developed by NIOSH to improve emergency responder safety and health. The surveillance system will identify problems for corrective action through the systematic collection, analysis, and interpretation of exposure, hazard, injury, and illness data. Discussion: The systematic collection, analysis, and interpretation of health and exposure data can give decision makers valuable information for improving the safety and health of those called upon during disasters. Surveillance data can also be useful to identify subgroups at risk of exposure to specific hazards so that appropriate prevention can be implemented, follow-up can be planned, and possible intervention can be implemented. For example, the rapid identification of specific respiratory illnesses among emergency responders may allow for monitoring of other workers and facilitate the introduction of controls and risk management at the site, as well as for long- term surveillance of affected workers.	CDC-NIOSH
	Time for pre- identified staff covering activated public health agency incident management lead roles (or equivalent lead roles) to report for immediate duty. Performance Target: 60 minutes or less	Process	Activate public health emergency operations	CDC
	Time for initial laboratorian to report for duty at the CDC PHEP-funded laboratory	Process	Manage laboratory activities	CDC
	Time for sentinel clinical laboratories to acknowledge receipt of an urgent message from the CDC Public Health Emergency Preparedness (PHEP)-funded Laboratory Response Network biological (LRN-B) laboratory	Process	Manage laboratory activities	CDC
	Time to complete a draft of an After Action Report and Improvement Plan	Process	Demobilize and evaluate public health emergency operations	CDC
	Time to issue a risk communication message for dissemination to the public	Process	Issue public information, alerts, warnings, and notifications	CDC

NQF ID if applicable (Endorsement Status)	Measure Title	Measure Type	Measure Description, if available	Developer/ Steward
0489 (Not Endorsed)	The Ability for Providers with HIT to Receive Laboratory Data Electronically Directly into their ONC-Certified EHR System as Discrete Searchable Data	Structure	Documents the extent to which a provider uses certified/qualified electronic health record (EHR) system that incorporates an electronic data interchange with one or more laboratories allowing for direct electronic transmission of laboratory data into the EHR as discrete searchable data elements.	CMS
0491 (Not Endorsed)	Tracking Clinical Results between Visits	Structure	Documentation of the extent to which a provider uses a certified/qualified electronic health record (EHR) system to track pending laboratory tests, diagnostic studies (including common preventive screenings) or patient referrals. The Electronic Health Record includes provider reminders when clinical results are not received within a predefined timeframe.	CMS
	Use of Certified EHR Technology	Process	Percentage of eligible clinicians (ECs) participating in the ACO who successfully meet the Advancing Care Information (ACI) Base Score.	CMS
	Vital Signs	Process	Percentage of patients transferred to another HEALTHCARE FACILITY whose medical record documentation indicated that the entire vital signs record was communicated to the receiving FACILITY within 60 minutes of departure	University of Minnesota Rural Health Research Center

APPENDIX D:
Healthcare System Readiness Committee and NQF Staff

COMMITTEE CO-CHAIRS

Paul Biddinger, MD
Director, Center for Disaster Medicine, Massachusetts General Hospital/Harvard University
Boston, Massachusetts

Margaret Weston, MSN, RN, CPHQ
Healthcare Quality Solutions Director, Johnson and Johnson Health Systems Inc.
Titusville, New Jersey

COMMITTEE MEMBERS

Scott Aronson, MS
Principal, RPA / Practice Leader - Healthcare, RPA, a Jensen Hughes Company
Plainville, Connecticut

Sue Anne Bell, PhD, FNP-BC, NHDP-BC
Assistant Professor, University of Michigan School of Nursing
Ann Arbor, Michigan

Emily Carrier, MD, MSc
Senior Manager, Manatt Health
Washington, DC

Cullen Case, EMPA, CEM, CBCP, CHEP, SCPM
Program Manager, Radiation Injury Treatment Network (RITN)
Minneapolis, Minnesota

Barbara Citarella, RN, MS, NHDP-BC
President, RBC Limited
Staatsburg, New York

Katelyn Dervay, PharmD, MPH, BCPS, FASHP
Pharmacotherapy Specialist - Emergency Medicine, PGY2 Emergency Medicine Residency Director, Tampa General Hospital
Tampa, Florida

Alexander Garza, MD, MPH
Chief Quality Officer, SSM Health
St Louis, Missouri

Jennifer Greene, MA, LPC
Integrated Care Project Manager, Partners Behavioral Health Management
Gastonia, North Carolina

Angela Hewlett, MD, MS
Associate Professor, University of Nebraska Medical Center
Omaha, Nebraska

Feygele Jacobs, DrPH, MPH, MS
President and CEO, RCHN Community Health Foundation
New York, New York

Mark Jarrett, MD, MBA, MS
Chief Quality Officer, SVP and Associate Chief Medical Officer, Northwell Health
New Hyde Park, New York

June Kailes
Disability Policy Consultant, Center for Disability and Health Policy at Western University of Health Sciences
Playa del Rey, California

Matthew Knott, MS, EFO, CFO, CEM, CEMSO, FM
Division Chief, Rockford Fire Department
Rockford, Illinois

Stacey Kokaram, MPH
Director, Office of Public Health Preparedness, Boston Public Health Commission
Boston, Massachusetts

Steven Krug, MD
Head, Division of Emergency Medicine, Ann & Robert H. Lurie Children's Hospital of Chicago
Chicago, Illinois

Nicolette Louissaint, PhD
Executive Director, Healthcare Ready
Washington, DC

David Marcozzi, MD, MHS-CL, FACEP
Associate Professor of Emergency Medicine, Director of Population Health and Assistant CMO for Acute Care, University of Maryland School of Medicine and University of Maryland Medical Center
Baltimore, Maryland

Glen Mays, PhD, MPH
Professor of Health Systems and Services Research, University of Kentucy College of Public Health
Lexington, Kentucky

James Paturas, MPA
Director, CEPDR, Yale New Haven Health
New Haven, Connecticut

Patrick Reilly, MD, FCCP, FACS
Professor of Surgery, University of PA Health System
Philadelphia, Pennsylvania

Marcie Roth
CEO, Partnership for Inclusive Disaster Strategies
Charleston, South Carolina

Lucy Savitz, PhD, MBA
VP, Health Research, Kaiser Permanente Northwest Region
Portland, Oregon

Jay Taylor, MSgt
EMS Program Manager, Pennsylvania Department of Health
Harrisburg, Pennsylvania

NQF STAFF

Elisa Munthali, MPH
Senior Vice President

Kyle Cobb, MS
Senior Director

Debjani Mukherjee, MPH
Senior Director

Poonam Bal, MHSA
Senior Project Manager

May Nacion, MPH
Project Manager

APPENDIX E:
Measure Concepts Related to Readiness

- ED beds at capacity > 6 hours or hallways filled > 6 hours
- No. of full rooms
- No., mean no., or % of boarders
- Boarding time
- Boarding time components
- Inpatient occupancy level
- ED volume/inpatient bed capacity
- Number of staffed acute care beds
- Alternate level of care bed availability
- Percentage of open appointments in ambulatory care clinics
- Staff Present
- ED workload Rate (# of daily ED visits x mean LOS / number of ED beds available)
- Physicians feel rushed
- Clinician opinion of crowding
- Emergency Physician satisfaction
- Waiting time
- Waiting room filled > 6 hours/day
- Time to physician
- No. of ED arrivals
- No. of pts in ED waiting room
- No. of pts registered
- No. or % of ambulance patients registered

ISBN 978-1-68248-095-3

NATIONAL QUALITY FORUM
1030 15TH STREET, NW, SUITE 800
WASHINGTON, DC 20005

http://www.qualityforum.org