

Regional Treatment Network for Ebola and Other Special Pathogens



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Executive Summary

Purpose of the Report

This report, prepared by the Department of Health and Human Services (HHS), Office of the Assistant Secretary for Preparedness and Response (ASPR), Office of Emergency Management's Division of National Healthcare Preparedness Programs, is in response to a request by the House Committee on Appropriations in House Report 114-699 accompanying H.R. 5926, the Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Bill, 2017:

Regional Treatment Centers—The Committee is aware that HHS has created a regional treatment network for future infectious disease outbreaks through a tier system using Ebola funds. The Committee requests a report on the Department's plans, including funding and timetables, for each tier outlining capabilities for infrastructure, training, and other key parameters, such as waste management. HHS should make a public version of the report available on the HHS website.

Background

Beginning in March 2014, West Africa experienced the largest Ebola virus disease outbreak on record. Unlike many smaller previous outbreaks of Ebola, this outbreak spread to multiple African countries and caused 28,616 suspected, probable, and/or confirmed human cases.¹ In August 2014, the first American patient with Ebola was flown to the United States (U.S.) for treatment. Additional patients were subsequently medically evacuated to the U.S. and two returned travelers were diagnosed and treated in Dallas, Texas, and New York City, New York. These experiences, and the secondary infections of two health care workers in a Dallas hospital, identified opportunities to improve preparedness for and treatment of suspected and confirmed patients with Ebola. In response, Congress appropriated emergency supplemental funding in fiscal year (FY) 2015, in part to ensure that the health care system would be adequately prepared to respond to future Ebola outbreaks. In doing so, Congress directed HHS to develop a regional approach to caring for future patients with Ebola.

Building upon a state- and jurisdiction-based tiered hospital approach and meeting Congress' regional directive, ASPR worked to develop a nationwide, regional treatment network for Ebola and other special pathogens, which balances geographic need, considers differences in institutional capabilities, and accounts for the potential need to care for a patient with Ebola. The Department's statutory authority for implementing this regional approach is derived from Title VI of Division G of the Consolidated and Continuing Appropriations Act, 2015, and section 311 of the Public Health Service Act, as amended. The funding provided through the ASPR Hospital Preparedness Program (HPP) [Ebola Preparedness and Response Activities Funding Opportunity Announcement \(FOA\)](#) cooperative agreement is intended to ensure that the nation's health care system is ready to safely and successfully identify, isolate, assess, transport, and treat patients with Ebola or patients under investigation for Ebola, and that it is well prepared for a future Ebola or other special pathogen outbreak. While the focus has been

¹ As of April 13, 2016, which marks the end of updated case counts after the World Health Organization terminated the Public Health Emergency of International Concern. [2014 Ebola Outbreak in West Africa - Case Counts](http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html), Centers for Disease Control and Prevention. <http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html>. Accessed May 3, 2017.

preparedness for Ebola, it is likely that preparedness for other novel, highly pathogenic diseases will also be enhanced through these activities.

“While the focus is on Ebola preparedness and response, it is likely that other novel, highly infectious diseases will also be enhanced through Ebola-related activities. The preparatory work funded through the (HPP) initiative has led to the beginning stages of the establishment of an in-state infectious disease system that includes a network of assessment hospitals, EMS/inter-facility transport services, and health care coalition.” (HPP awardee)

Since 2015, the HPP *Ebola Preparedness and Response Activities* cooperative agreement has provided significant support to build the regional tiered network from a framework on paper to a prepared, functional system of care for Ebola and other special pathogens; however, it is important to note that the current capacity of this system is not likely to be sufficient for many types of infectious disease outbreaks (e.g., pandemic influenza and other respiratory pathogens).

Section I: Regional Treatment Network Approach

Progression from Interim Guidance to the Regional Treatment Network

In December 2014, HHS released its initial [Interim Guidance for U.S. Hospital Preparedness for Patients under Investigation or with Confirmed Ebola Virus Disease: A Framework for a Tiered Approach](#)², which outlined the different roles U.S. acute health care facilities could play in preparing to identify, isolate, and evaluate patients with possible Ebola or to treat patients with confirmed Ebola. These roles included serving as Ebola treatment centers, assessment hospitals, and frontline health care facilities. Beginning in fall 2014, hospitals that had been assessed by a Centers for Disease Control and Prevention (CDC)-led Rapid Ebola Preparedness (REP) team were designated by state health officials to serve as Ebola treatment centers. HPP staff participated in REP team assessments of potential Ebola treatment centers during that time.

Experience with patients with Ebola in the U.S. has shown that care of such individuals is clinically complex, requiring highly skilled health care providers and technologically-advanced care. This led Congress, experts, and key health stakeholder groups to suggest that, subsequent to the interim guidance, care for patients with Ebola should be concentrated in a small number of facilities. At the same time, however, a patient may present at any U.S. health care facility with any number of symptoms, exposures, or travel histories; therefore, all of the nation’s acute care facilities must be prepared to identify, isolate, and provide initial treatment to one or more simultaneous clusters of patients with Ebola until they can be transferred to a facility that can provide a more thorough assessment and/or definitive care. To that end, HHS built upon the interim approach that focused on state- and jurisdiction-based tiered hospitals to develop a strategy for a nationwide, regional treatment network for Ebola and other infectious diseases, which balances geographic need, differences in institutional capabilities, and accounts for the potential risk of needing to care for a patient with Ebola.

² Centers for Disease Control and Prevention (CDC). [Interim Guidance for U.S. Hospital Preparedness for Patients under Investigation \(PUI\) or with Confirmed Ebola Virus Disease \(EVD\): A Framework for a Tiered Approach](#). Available at: <http://www.cdc.gov/vhf/ebola/healthcare-us/preparing/hospitals.html>. Updated August 28, 2015.

Four Tiers in the Regional Treatment Network

The regional tiered approach allows for each of HHS' 10 regions to augment preparedness and response coverage across the spectrum of required capabilities, while also strategically concentrating resources at regional Ebola and other special pathogen treatment centers to maximize the impact of federal funding and minimize the risk of exposure to a highly infectious disease like Ebola.

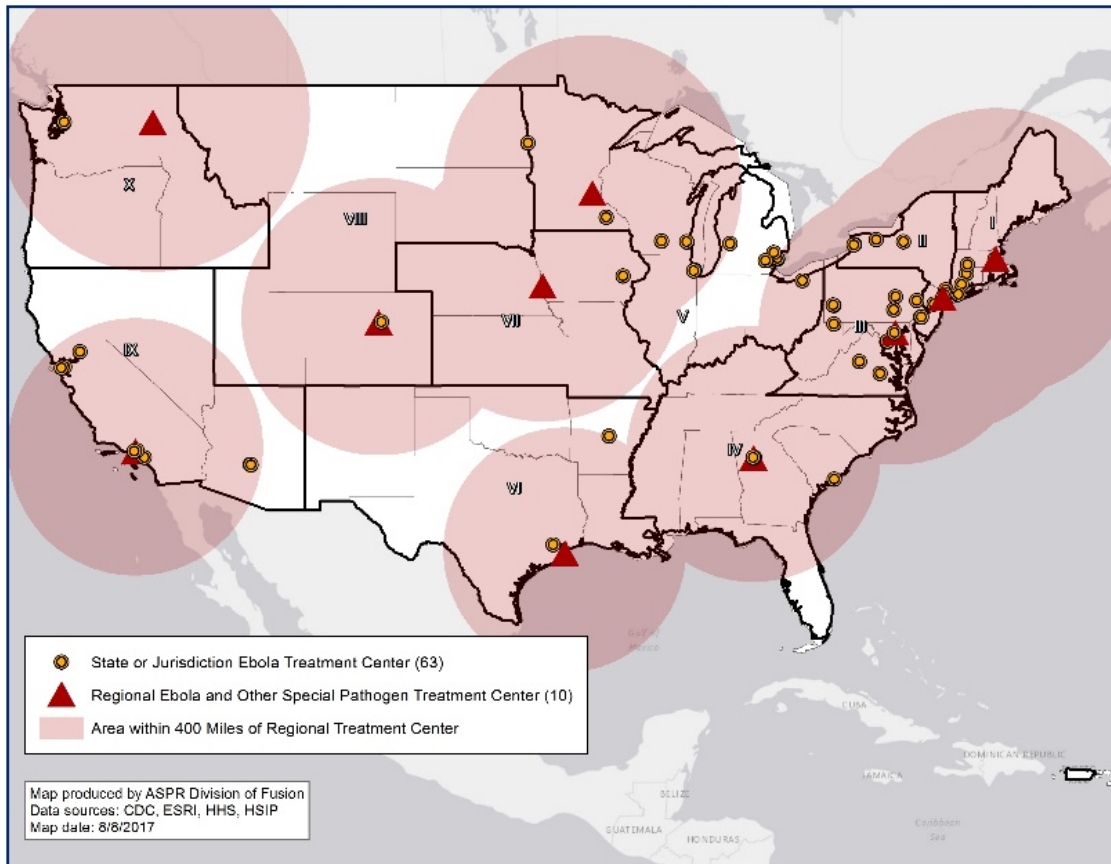


Figure 1: Regional Ebola Treatment Network

The HHS regional framework for the tiered approach designates four roles for health care facilities: frontline health care facilities, Ebola assessment hospitals, Ebola treatment centers, and regional Ebola and other special pathogen treatment centers (see Figure 1). To implement the approach, state and local public health officials collaborated with private health care system stakeholders to designate health care facilities across the state and in the regions to serve in one of these four roles. Aligned to the HHS framework and guidance, the nationwide regional treatment network for Ebola and other infectious diseases currently contains the following:

- **Regional Ebola and other special pathogen treatment centers** that can be ready within eight hours to receive a patient with confirmed Ebola from their region, across the U.S., or medically-evacuated from outside of the U.S., as necessary. These hospitals have enhanced capacity to care for other highly infectious diseases. The HPP-financed regional Ebola and other special pathogen treatment centers are:

- Region 1: Massachusetts Department of Public Health in partnership with Massachusetts General Hospital (Boston, Massachusetts);
 - Region 2: New York City Department of Health and Mental Hygiene in partnership with New York City Health and Hospitals Corporation/HHC Bellevue Hospital Center (New York City, New York);
 - Region 3: Maryland Department of Health and Mental Hygiene in partnership with Johns Hopkins Hospital (Baltimore, Maryland);
 - Region 4: Georgia Department of Public Health in partnership with Emory University Hospital and Children’s Healthcare of Atlanta/Egleston Children’s Hospital (Atlanta, Georgia);
 - Region 5: Minnesota Department of Health in partnership with University of Minnesota Medical Center (Minneapolis, Minnesota);
 - Region 6: Texas Department of State Health Services in partnership with University of Texas Medical Branch at Galveston (Galveston, Texas);
 - Region 7: Nebraska Department of Health and Human Services in partnership with Nebraska Medicine – Nebraska Medical Center (Omaha, Nebraska);
 - Region 8: Colorado Department of Public Health and Environment in partnership with Denver Health Medical Center (Denver, Colorado);
 - Region 9³: California Department of Public Health in partnership with Cedars-Sinai Medical Center (Los Angeles, California); and,
 - Region 10: Washington State Department of Health in partnership with Providence Sacred Heart Medical Center and Children’s Hospital (Spokane, Washington).
- **State or jurisdiction Ebola treatment centers** that can safely care for patients with Ebola in the event of a cluster of patients with Ebola that overwhelms the regional Ebola and other special pathogen treatment center. Clinical judgment, available logistical resources, and patient preference may indicate that the patient should receive treatment at a state or jurisdiction Ebola treatment center rather than be transferred to a regional Ebola and other special pathogen treatment center.
 - **Assessment hospitals** that can receive and isolate patients under investigation for Ebola and care for the patient until a diagnosis of Ebola can be confirmed or ruled out and until discharge or transfer is completed.
 - **Frontline health care facilities** that are prepared to rapidly identify and isolate patients who may have Ebola. These facilities must be able to promptly inform the hospital/facility infection control program and state and local public health agency and assessment hospitals or Ebola treatment centers (as necessary) to arrange patient transfer. Frontline health care facilities are also responsible to provide stabilizing treatment, per the Emergency Medical Treatment and Labor Act (EMTALA) requirements.⁴

³ Region 9 did not have a Part B awardee in budget period one. Cedars-Sinai was named the Region 9 awardee in June 2016.

⁴ The Emergency Medical Treatment and Labor Act (EMTALA) (1986).

Table 1: Regional Treatment Network Capabilities Required by Tier

Tier and Count*	Role and Capabilities Required ⁵⁶
Frontline health care facility (4,845)	<ul style="list-style-type: none"> • Quickly identifies and isolates patients with possible Ebola; • Notifies the hospital/facility infection control program, other appropriate facility staff, state and local public health agencies, and assessment hospitals or Ebola treatment centers (as necessary) to arrange patient transfer; • Has enough Ebola personal protective equipment (PPE) for at least 12–24 hours of care; and, • Provides stabilizing treatment per EMTALA requirements.
Ebola assessment hospital (217)	<ul style="list-style-type: none"> • Safely receives and isolates a patient with possible Ebola; • Provides immediate laboratory evaluation and coordinates Ebola testing; • Has enough Ebola PPE for up to 96 hours of evaluation and care for patient(s) under investigation for Ebola; • Has staffing plans to support 96 consecutive hours of clinical care. All staff involved in or supporting patient care are appropriately trained for their roles; • Cares for a patient for up to 96 hours (including evaluation and management of alternative diagnoses) until Ebola diagnosis is confirmed or ruled out; • Secured the services of a waste management vendor capable of managing and transporting Category A infectious substances; and, • Coordinates with necessary stakeholders (including transport providers) to transport a patient to an Ebola treatment center, depending on the status of the patient and the capacity of the Ebola assessment hospital.
Ebola treatment center (63)	<ul style="list-style-type: none"> • Collaborates with the state and local public health agency, emergency medical services provider(s) on the development of interfacility transportation plans; • Safely receives and isolates a patient with confirmed Ebola; • Cares for patients with Ebola for duration of illness; • Has enough Ebola PPE for at least seven days of care (will restock as needed); • Has sustainable staffing plan to manage several weeks of care. Staff members who will be involved in managing the patient are familiar with the clinical protocols for management of patients with Ebola; • Secured the services of a waste management vendor capable of managing and transporting Category A infectious substances; and, • CDC Ebola Response Teams are ready to deploy to provide assistance as needed.
Regional Ebola and other special pathogen treatment centers (10)	<p>These hospitals are part of the network of Ebola treatment centers across the country but have what HHS calls "enhanced capabilities." The selected hospitals are required to do the following:</p> <ul style="list-style-type: none"> • Accept patients within eight hours of notification; • Be able to treat simultaneously at least two patients with Ebola for duration of illness; • Have respiratory infectious disease isolation capacity or negative pressure rooms for at least 10 patients; • Conduct trainings and exercises each quarter; • Be able to treat pediatric patients with Ebola or another highly infectious disease or partner with a nearby facility to do so; • Be able to safely handle waste from such patients; and,

* Frontline and assessment hospital counts are current as of 2015-2016 data. Ebola treatment center and regional Ebola and other special pathogen treatment center counts reflect July 2017 data. HPP will have updated hospital counts for all tiers of the regional treatment network following the validation and analysis of 2016-2017 reported data. Final 2016-2017 performance data was due from awardees to ASPR in September 2017. ASPR's validation and analysis of the data will be complete by late 2017.

⁵ [Interim Guidance for U.S. Hospital Preparedness for Patients under Investigation \(PUI\) or with Confirmed Ebola Virus Disease \(EVD\): A Framework for a Tiered Approach](#). <http://www.cdc.gov/vhf/ebola/healthcare-us/preparing/hospitals.html>.

⁶ [HPP Ebola Preparedness and Response Activities FOA](#) <https://www.grants.gov/web/grants/view-opportunity.html?opId=274709>.

	<ul style="list-style-type: none"> • Receive annual readiness assessment from the National Ebola Training and Education Center.
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Patient Decision Algorithm for the Regional Treatment Network

In addition to the overarching framework and guidance outlined in the table above, HHS developed an Ebola patient decision algorithm that helps stakeholders across the regional treatment network decide where a patient under investigation for Ebola should be screened, evaluated, and treated based on factors such as availability of logistical resources (e.g., available beds and transport resources), facility capacity, and clinical judgement. This Ebola patient decision algorithm provides critical guidance on how the regional treatment tiers, as described above in Table 1, should work together to safely and successfully treat a patient with Ebola.

A visual depiction and simplification of the algorithm is shown in Figure 2, below.

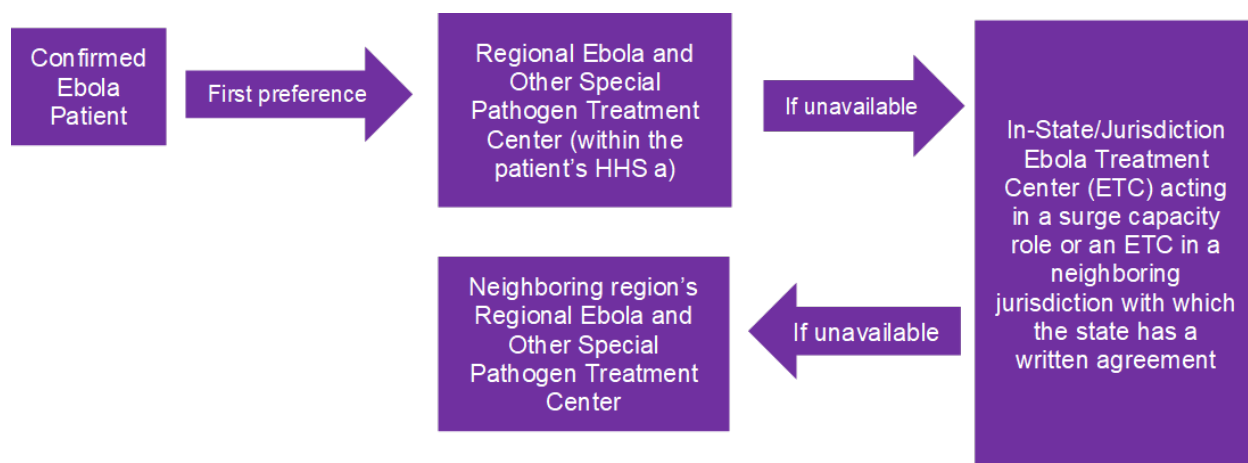


Figure 2: Ebola Patient Decision Algorithm Depiction

Section II: Oversight and Financing for the Regional Treatment Network

Regional Treatment Network Funding Strategy

In response to the 2014-2015 Ebola outbreak, Congress appropriated \$5.4 billion in emergency supplemental funding to a number of federal agencies, including HHS, which have a key role in response and preparedness activities. This emergency Ebola funding was directed towards supporting international response, research and development, and the U.S. domestic response. Within the federal government, HHS is primarily responsible for overseeing domestic preparedness and response for Ebola and other emerging infectious disease outbreaks.⁷ Of the \$5.4 billion in total emergency funding, \$259.7 million was directed to HHS for Ebola preparedness and response activities in support of the regional treatment network. HHS' standup of the regional treatment network was a key feature of the U.S. domestic response.

⁷ [National Response Framework and Public Health Service Act: https://www.phe.gov/Preparedness/planning/authority/Pages/default.aspx.](https://www.phe.gov/Preparedness/planning/authority/Pages/default.aspx)

Table 2: Regional Treatment Network Funding

Funding Type	Funding Amount	Goal of Funding
HPP Ebola Part A	\$181,171,000	Support state- or jurisdiction-level preparedness for frontline health care facilities, assessment hospitals, state or jurisdiction Ebola treatment centers, and health care coalitions, in addition to emergency medical services (EMS) and the overall health care system.
HPP Ebola Part B	\$32,500,000	Establishment of an Ebola and other special pathogen treatment center (one per each of the 10 HHS regions).
National Ebola Training and Education Center (NETEC)	\$24,000,000 <i>Jointly funded by ASPR and CDC</i>	Establish a national training and education center to increase the competency of health care and public health workers and the capability of health care facilities to deliver safe, efficient, and effective care to patients with Ebola and other special pathogens.
Health Care System Training Simulation and Quarantine Center for Ebola and Other Special Pathogens	\$20,000,000	Establish a training, simulation, and quarantine center for Ebola and other special pathogens.
ASPR Technical Resources, Assistance Center, and Information Exchange (TRACIE)	\$2,000,000	Support ASPR TRACIE to develop and disseminate topic collections and resources specific to Ebola (e.g., EMS checklist for Ebola preparedness), which are available to all health care stakeholders.
Total	\$259,671,000	

Although building on the all-hazards health care preparedness and response capacity and capabilities developed since 2002 through ASPR’s HPP, the U.S. regional treatment network for Ebola is primarily supported through emergency supplemental funding. Through the *Ebola Preparedness and Response Activities* cooperative agreement, ASPR HPP has awarded \$213.7 million for the establishment of the regional treatment network for Ebola and other special pathogens. HHS has also used the emergency Ebola funding to establish the National Ebola Training and Education Center (NETEC) and support the development of the Health Care System Training Simulation and Quarantine Center for Ebola and Other Special Pathogens. The funding directly supports the development of key capabilities needed for response to an Ebola outbreak in the U.S.

ASPR purposefully distributed the vast majority of the supplemental funding in the first year of the five-year HPP project period to encourage a rapid buildup of key capabilities across each facility tier. The remaining years of supplemental and competitive funds are intended to sustain and maintain the regional treatment network’s preparedness and response capabilities. FY 2019 marks the final year in which emergency funds provided for Ebola will be available to support the regional treatment network. Per the cooperative agreements with HPP awardees, ASPR’s staff and subject matter experts have substantial involvement with Ebola preparedness activities that is above and beyond routine grant administration. ASPR’s active participation amplifies the impact of Ebola preparedness activities; for example, HPP Field Project Officers participate in NETEC site assessment visits and also monitor outcomes from the HPP-required exercises.

The HPP Ebola preparedness and response funding for the regional tiered approach are split into two parts: Part A and Part B, which are described below.

Part A: Health Care System Preparedness for Ebola

ASPR allocated Part A funding to all current 62 HPP awardees (the 50 states, the District of Columbia, three directly-funded cities, and all U.S. territories and freely associated states) over a five-year project period. HPP allocated \$181.2 million in Part A funding to support state- or jurisdiction-level preparedness for frontline health care facilities, assessment hospitals, state or jurisdiction Ebola treatment centers, and health care coalitions, in addition to emergency medical services (EMS) and the overall health care system. ASPR's Part A funding strategy included a base amount + population + Ebola risk formula that determined funding levels for each awardee, which ranged from \$203,000 to \$15.8 million, with an average award of \$2.9 million. The risk portion was based on the percentage of returning travelers from impacted countries and reflected West African diaspora population centers and jurisdictions with enhanced airport screenings.⁸ Through Part A, jurisdictions could use a portion of the funding to compensate health care facilities retroactively for Ebola preparedness activities undertaken since July 2014; build additional capabilities to ensure that the nation's health care system and health care workers are ready to safely and successfully identify, isolate, assess, transport, and treat patients under investigation for Ebola or confirmed to have Ebola; and be well prepared for a future Ebola-like event. HPP requires that all entities (Ebola treatment centers, assessment hospitals, and health care coalitions) receiving funding through Part A establish a plan to maintain their readiness to care for a patient with Ebola for the duration of the full five-year project period (May 2015-May 2019) through annual staff trainings and exercises and sustainment of Ebola PPE.

Part B: Development of a Regional Treatment Network for Ebola Patient Care

For Part B, ASPR competitively awarded funding to 10 HPP awardees who partnered with a health care facility (or facilities) within their jurisdictions to develop regional Ebola and other special pathogen treatment centers (one in each of the 10 HHS regions). Part B funding totaled \$32.5 million, with \$3.25 million in funding allocated to each of the 10 Part B awardees over the course of the five-year project period. Each regional Ebola and other special pathogen treatment center serves as a regional asset and is required to accept patients from outside of its jurisdiction. The regional Ebola and other special pathogen treatment centers have enhanced preparedness capabilities to ensure that they are the leading provider of care and treatment for patients with Ebola in the U.S. and that they have the capabilities needed to manage other high-containment infectious diseases in the future.⁹ Part B awardees also lead the coordinated regional planning effort for all jurisdictions within their region, including agreements and plans for the inter-facility transfer of patients within the region.

Of the total Part B funding amounts, HPP provided at least \$2.25 million during the first year and allocated \$250,000 in the four subsequent years for each regional Ebola and other special pathogen treatment center to sustain and maintain capabilities. The funding is initially received by the awardee, who then directs no less than 90 percent of funds to their regional Ebola and other special pathogen center hospital partners. Through the funding agreement, HPP requires

⁸ High-risk jurisdictions include: California, Chicago, Connecticut, District of Columbia, Georgia, Maryland, Massachusetts, Minnesota, New Jersey, New York, New York City, North Carolina, Ohio, Pennsylvania, Rhode Island, Texas, Virginia, and Washington. Risk is based on the percentage of returning travelers from affected countries and reflects West African diaspora population centers and jurisdictions with enhanced airport entrance screenings.

⁹ [Hospital Preparedness Program \(HPP\) Ebola Preparedness and Response Activities FOA](https://www.grants.gov/web/grants/view-opportunity.html?oppld=274709)
<https://www.grants.gov/web/grants/view-opportunity.html?oppld=274709>.

the Part B awardee to provide lead support for regional planning for the development of the regional network for Ebola care in addition to developing, supporting, and maintaining center capabilities to provide immediate and effective care to a patient with Ebola.

National Ebola Training and Education Center (NETEC)

Key lessons learned from the initial health care system response to Ebola cases include the importance of protecting the health care workforce and the critical role of early case recognition in improving outcomes, given the clinical complexity of caring for a patient with Ebola. Building on these fundamental lessons, ASPR and CDC partnered to allocate \$24 million in emergency Ebola funds to establish the NETEC. The NETEC is funded through a five-year CDC and ASPR joint cooperative agreement that began in 2015. The NETEC uses HHS funding to support the regional treatment network by leveraging public and private expertise to share promising practices and scale activities to address Ebola. More information about NETEC is provided in a separate section below.

Health Care System Training Simulation and Quarantine Center for Ebola and Other Special Pathogens

Through evaluation of the domestic Ebola response, HHS also found a significant gap in quarantine capacity in the U.S. health care delivery system. The U.S. lacked adequate space to monitor individuals coming to the U.S. who may have been exposed to Ebola patients from impacted regions. To close this gap, HPP awarded nearly \$20 million to the University of Nebraska Medical Center (UNMC) for a training, simulation, and quarantine center. Upon completion in 2018, this center will provide simulated clinical training to federal responders (the National Disaster Medical System and the U.S. Public Health Service Commissioned Corps) and now has the capacity to quarantine up to 20 individuals simultaneously, if necessary, on the UNMC campus.

Section III: The State of Preparedness

Regional Treatment Network Performance Measurement Strategy

Prior to the 2014-2015 Ebola outbreak, the U.S. did not have a systematic approach to preparing for and responding to an outbreak of a highly infectious special pathogen. Through HHS' investments, specifically the *HPP Ebola Preparedness and Response Activities* cooperative agreement and NETEC, the U.S. health care system has achieved marked progress in the development of a regional network of tiered hospitals specifically for Ebola and other special pathogens.

HPP Ebola Cooperative Agreement Performance Measurement

As required in the *HPP Ebola Preparedness and Response Activities* cooperative agreement, HPP collects annual performance measures data, which allow the U.S. government to evaluate and monitor the "state of preparedness" across the U.S. HPP collects and analyzes quantitative and qualitative data from awardees, regional Ebola and other special pathogen treatment centers, state or jurisdiction Ebola treatment centers, assessment hospitals, and health care coalitions to understand comprehensively the strengths, progress, and gaps across the regional treatment network.¹⁰ At the request of the House Committee on Appropriations, the Department also details the U.S. regional treatment network's state of preparedness at a system and tier level for clarity and to demonstrate how each tier and the overarching regional treatment network are progressing against the required capabilities needed to ensure health security in the emerging infectious disease space.

Report of the Independent Panel on the HHS Ebola Response

In the immediate aftermath of the Ebola outbreak, the Secretary of HHS tasked ASPR with convening an independent expert panel to review the HHS Ebola response and provide recommendations on improving the Department's preparedness and response efforts.

The independent panel released its findings in the June 2016, *Report of the Independent Panel on the U.S. Department of Health and Human Services (HHS) Ebola Response*. Shortly thereafter, the Department released the *U.S. Department of Health and Human Services Ebola Response Improvement Plan*, outlining how the panel's findings and recommendations would be addressed. The independent panel report captured many of the overarching systematic gaps that prevented the U.S. from being adequately prepared for its first Ebola case in 2014.

The panel found that the U.S. government was not prepared to activate a coordinated response and did not anticipate complications associated with establishing domestic Ebola treatment centers. Furthermore, federal, local, and state governments issued conflicting guidance for response measures (e.g., waste management).¹⁰ The panel's report and the Department's response plan captured key lessons learned from the domestic response to the 2014-2015 Ebola outbreak that serve as a foundation for building and assessing the regional treatment network's state of preparedness.

¹⁰ At the time the Department prepared this report, year one (2015-2016) HPP Ebola performance and impact data were available.

National Ebola Regional Training and Education Center: Role and Progress in Support of Regional Treatment Network Readiness

NETEC's Role, Purpose, and Achievements

The NETEC's purpose is to increase the competency of the health care and public health workforce and improve the capability of health care facilities to deliver safe, efficient, and effective care to patients with Ebola and other special pathogens. Although it is a separate entity from the actual tiers, the NETEC's establishment and ongoing support of the regional treatment network is critical to elevating the nation's state of readiness for an Ebola or other special pathogen threat.



Figure 3: Regional Ebola Treatment Network and NETEC Combined Logo

The NETEC is a consortium of the three U.S. health facilities that safely and successfully treated a confirmed patient with Ebola in the U.S. during the 2014-2015 outbreak: Emory University in Atlanta, Georgia; UNMC in Omaha, Nebraska; and the New York City Health and Hospitals Corporation/HHC Bellevue Hospital Center in New York, New York. NETEC experts work directly with ASPR and CDC to provide direct training, peer assessment, and technical consultation with health care facilities to support their preparedness efforts for Ebola and other special pathogens. Many of the NETEC's activities directly benefit the regional treatment network, including NETEC metrics that assess facility and workforce readiness for Ebola patient care; annual, on-site peer assessments at regional Ebola and other special pathogen treatment centers and state or jurisdiction Ebola treatment centers; and a suite of educational resources including exercises and trainings related to care of patients with Ebola or other special pathogens.

Since its establishment in 2015, the NETEC has proven to be a unique national resource that has supported the tiered, regional treatment network through education and collaboration. From June 2015 through July 2017, the NETEC developed metrics to measure facility and health care worker readiness to care for patients with Ebola and other special pathogens; trained over 3,000 participants in special pathogens readiness trainings; and completed annual site visits and readiness assessments at each of the 10 regional Ebola and other special pathogen treatment centers, among other accomplishments outlined in the table below. The NETEC releases an annual report that outlines its activities, site assessment findings, areas for improvement, and recommendations for strengthening national capabilities for an Ebola or special pathogens outbreak response; the [NETEC Annual Report FY 2016](#) will be referenced throughout this report.¹¹ Table 3, provided below, outlines selected NETEC year one and year two accomplishments.

Table 3: NETEC Key Achievements, 2015-2017

June 2015-June 2016 (Year One)	June 2016-June 2017 (Year Two)
<ul style="list-style-type: none"> • One hundred percent of HHS regions were represented at the May 2016 Regional Ebola Treatment Center Summit hosted by NETEC; • Ten domains were developed by NETEC to measure facility and health care worker readiness 	<ul style="list-style-type: none"> • Fifteen facilities assessed for readiness in 14 U.S. states or territories; • Forty states, the District of Columbia, and five U.S. territories represented at in-person trainings;

¹¹ [NETEC Annual Report FY 2016](#)

https://netec.org/wp-content/uploads/2017/05/NETEC-Annual-Report-FY-2016_v7_111016-Final.pdf.

June 2015-June 2016 (Year One)	June 2016-June 2017 (Year Two)
<p>to care for patients with Ebola and other special pathogens;</p> <ul style="list-style-type: none"> • NETEC visited all 10 HHS designated regional Ebola and other special pathogen treatment centers for readiness assessments; • Five NETEC faculty members took part in five symposia and exercises in Hawaii, Louisiana, Maryland, Minnesota, and New Jersey; • Thirty-four exercise design templates were developed by NETEC for use in an Ebola exercise; • Six readiness assessment state visits were conducted by NETEC in Hawaii, Idaho, Illinois, New Jersey, Texas, and at the Chicago Ebola Response Network; • NETEC.org website received 1,058 page views; • Four didactic Ebola preparedness courses were conducted by NETEC faculty; • Thirty-two clinicians participated in hands-on practice of several skills needed to care for a patient with Ebola at NETEC's one clinical Ebola preparedness simulation course; and, • Three hundred eighty attendees participated in the clinical course and the four didactic Ebola preparedness courses conducted. 	<ul style="list-style-type: none"> • Twenty-four educational activities held, including eight immersive simulation scenarios used for training; • NETEC educational activities reached 3,490 people (189 percent increase since year one); • Six new and 38 updated exercise design templates were developed; • Six hundred and six technical assistance requests addressed; • NETEC.org website received 31,687 page views; • One hundred thirty-eight people attended the 2017 NETEC Regional Ebola Treatment Center Summit, representing all 10 regional Ebola and other special pathogen treatment centers; • Health care facility self-assessment tool developed and implemented: 132 self-assessment metrics were reviewed and revised by 20 subject matter experts; • Health care facility on-site assessment process developed and implemented: 23 capabilities developed; • Special Pathogens Research Network established; and, • A 24/7/365 phone line established for emergency consultation with federal partners and health care facilities requiring assistance with patients suspected of or proven to have infections with special pathogens.

NETEC's Hospital Readiness and Assessment Activities

The NETEC's activities and assessments have benefits across all four tiers of the regional treatment network. Regional Ebola and other special pathogen treatment centers work most closely with the NETEC to guide investment, development, training, and exercising for advanced treatment capabilities.

NETEC experts worked with CDC and ASPR to conduct non-punitive, non-regulatory, non-accreditation assessment site visits at hospitals. In 2016 and 2017, NETEC experts conducted annual site visits to the nation's 10 regional Ebola and other special pathogen treatment centers; these visits facilitated best practice sharing and also allowed for experts to assess regional Ebola and other special pathogen treatment centers' strengths and gaps. In the [NETEC Annual Report FY 2016](#), NETEC's experts outlined year one (2015-2016) aggregated insights from their site assessments at regional Ebola and other special pathogen treatment centers and described the focus areas where regions felt the least and most prepared. The NETEC found that in the first year, regions felt least ready in the areas of clinical care and special populations, pre-hospital transport plans, and management of the deceased. According to NETEC analysis, regions felt most prepared in patient placement, PPE and procedures for donning and doffing, and staffing, training, and management of the patient care team. Further analysis of where regional Ebola and other special pathogen treatment centers are the least and most ready is detailed in Figure 4 below.

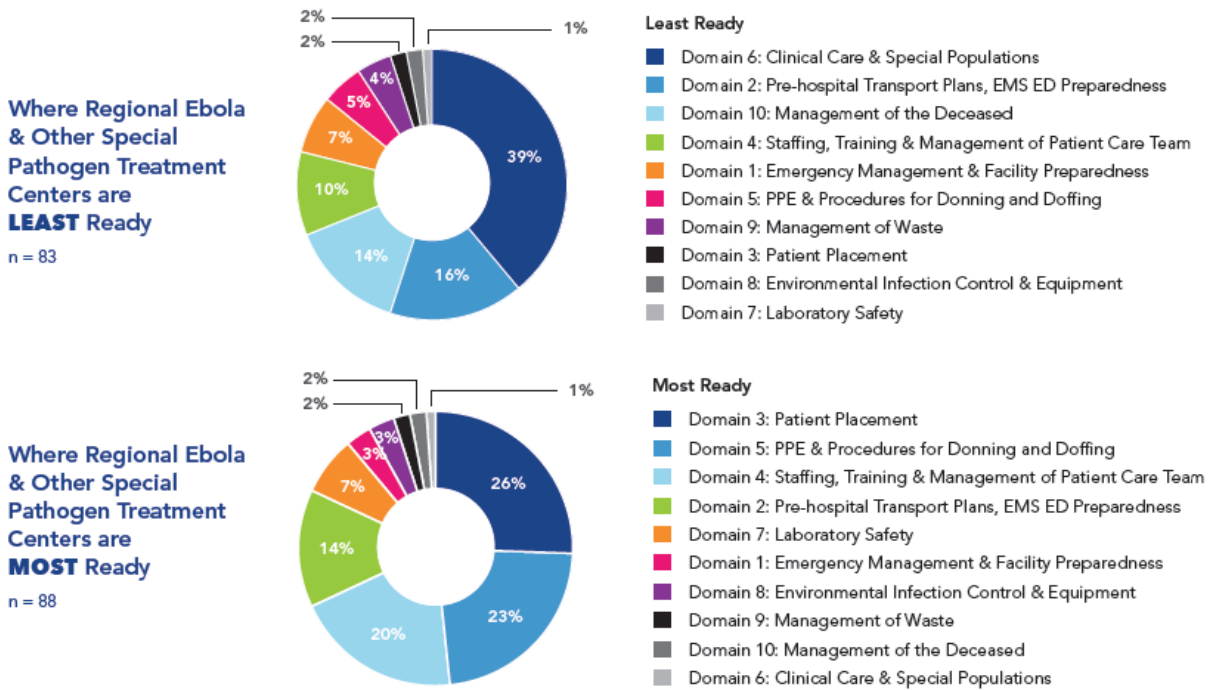


Figure 4: NETEC Regional Readiness Year One Findings¹²

The NETEC's year two (2016-2017) site assessments initial results show that treatment and care (specifically special population care), laboratory, external transport, and staff and family well-being within health care worker management are areas for growth in future years. The NETEC developed mitigation strategies to provide targeted training, technical assistance, and resources in year three (2017-2018) to address these gaps. The NETEC works with hospital partners to proactively identify current barriers and areas of future need, enabling NETEC to develop recommendations and provide appropriate support.

In 2017, the NETEC hosted a Regional Ebola Treatment Summit; 138 individuals attended from all 10 regional Ebola and other special pathogen centers, CDC, and ASPR. These regional partners shared innovations and best practices, engaged in breakout groups in key topic areas, discussed national gaps, and developed working groups to address ongoing challenges in the maintenance and advancement of the regional treatment network. During the Summit, attendees identified the following regional or national issues as requiring further discussion or guidance:

- Laboratory specimen transportation;
- Coordinating regional EMS transportation;
- PPE validation, standardization, and training;
- Sustaining funding and stakeholder engagement; and,
- Waste management and transportation.

In year three, NETEC aims to expand its online course offerings, host courses at partner facilities, and continue to provide specialized courses such as a Clinical Pediatrics Infectious Disease Simulation course. Throughout the next year, NETEC plans to increase the number of online resources and will establish a repository to increase accessibility of NETEC guidance, protocols, and educational materials. Through the remaining three years of the cooperative

¹² [NETEC Annual Report FY 2016](https://netec.org/wp-content/uploads/2017/05/NETEC-Annual-Report-FY-2016_v7_111016-Final.pdf)

https://netec.org/wp-content/uploads/2017/05/NETEC-Annual-Report-FY-2016_v7_111016-Final.pdf.

agreement, NETEC will continue to conduct annual site assessments at regional Ebola and other special pathogen treatment centers. The NETEC's year one and two findings inform its future training and educational activities for regional Ebola and other special pathogen treatment centers, which will enable continued learning and advancement of enhanced capabilities at this "top tier" of the regional treatment network.

Progress and Capabilities by Tier

As described earlier in this report and detailed in Table 1, all U.S. acute health care facilities have a role in preparing to identify, evaluate, and facilitate treatment for patients under investigation for Ebola and other emerging infectious diseases. HPP awardees are required to report annually on a small set of ASPR-defined performance measures that will demonstrate or show progress toward the accomplishment of program outcomes of the cooperative agreement. There are specific HPP performance measures that measure readiness at each tier of the regional treatment network; selected year one findings and associated strategies are outlined in the tier-specific sections below.

Regional Ebola and Other Special Pathogen Treatment Centers

The regional Ebola and other special pathogen treatment centers are the cornerstone of the regional treatment network. These advanced, leading patient-care centers are encouraged to work outside of state lines to truly collaborate within their regions and the greater U.S. to support planning, coordination, and development of innovative treatment protocols and practices that benefit the regional treatment network as a whole.

HPP has eight distinct performance measures that guide and account for foundational planning and exercise activities for the regional Ebola and other special pathogen treatment centers.¹³ The planning performance measures ensure the regional Ebola and other special pathogen treatment centers are engaging the correct stakeholders within their region. This required engagement promotes better coordination between all facility tiers within a region. Regional Ebola and other special pathogen treatment centers were largely successful in meeting their required planning goals in the initial budget period:

- One hundred percent of regional Ebola and other special pathogen treatment centers coordinated with public health and emergency management leaders and elected officials, such as governors, to ensure permissible movement of patients between states.
- Eight of the nine regional Ebola and other special pathogen treatment centers had 100 percent participation rate from their region's states and jurisdictions in the development of the regional concept of operations (CONOPS).
- Four regional Ebola and other special pathogen treatment centers were successful in ensuring a written and signed agreement was in place to transfer patients from assessment hospitals or Ebola treatment centers to the regional Ebola and other special pathogen treatment center. ASPR recognizes that this measure will be an area for improvement in future years, as the regional treatment network relies on clearly defined, tactical plans and protocols for the transport of patients between the different facility tiers.

¹³ Please note, at the time of writing, HPP had budget period one data available (June 2015-June 2016); HHS region 9 did not have a regional treatment center during the first budget period.

The regional Ebola and other special pathogen treatment center performance measures also account for workforce training, in addition to investment in essential, advanced treatment equipment and infrastructure needed to care for a patient with Ebola or other special pathogen. HPP's requirements allow for regional flexibility and encourage regional Ebola and other special pathogen treatment centers to invest in the PPE and infrastructure their facility needs to ensure their facility's infrastructure is ready and policies are established to accept a patient with Ebola or emerging infectious disease within eight hours of notification. Key year one capability progress includes:

- Five hundred eighty-four total rostered staff across the regional Ebola and other special pathogen treatment centers were pre-identified to provide care for patients with confirmed Ebola; 98 percent of these pre-identified rostered staff received quarterly training in infection control, safety, and care for a patient with Ebola.
- One hundred percent of regional Ebola and other special pathogen treatment centers have seven days of PPE supply on hand, as recommended by CDC; 100 percent of centers also have a plan for just-in-time acquisition of PPE for additional needs.
- Seven of the nine regional Ebola and other special pathogen treatment centers have an on-site, high volume autoclave or incinerator to handle Ebola-contaminated or other highly-contaminated infectious waste.

Finally, the regional Ebola and other special pathogen treatment centers practiced their ability to activate improved response capabilities in each region. All of the regional Ebola and other special pathogen treatment centers conducted quarterly exercises that incorporated unannounced first-person drills, patient transport, and patient care simulation and were successful in meeting the HPP exercise goals.

Ebola Treatment Centers

The regional treatment network depends on the willingness and capabilities of a small number of acute health care facilities distributed throughout the U.S. to care for a patient with Ebola or another highly infectious special pathogen for the duration of their illness. HHS overcame significant challenges to establish the first Ebola treatment centers. In its report, the Independent Panel on the HHS Ebola Response found that costs and concerns around contagion initially discouraged hospitals from volunteering to serve as Ebola treatment centers.¹⁴ Given these barriers, it is a significant achievement that the Department was able to quickly establish a network of these higher capability facilities.

As of July 2017, there are currently 63 state- or jurisdiction-designated Ebola treatment centers across the nation.¹⁵ During the first budget period, awardees allocated \$47.3 million to support preparedness activities at Ebola treatment centers. HPP requires Ebola treatment centers to participate in and report back on regional planning, training, and exercise activities in coordination with other members of the regional tiered system. HPP Ebola performance measures for this tier test are accessibility of the facility's PPE supply; whether facility staff are trained in proper PPE donning and doffing protocol; the facility's effectiveness and efficiency in preparation to admit an Ebola patient; facility communication systems; and, capability of a facility to fulfill Ebola or other special pathogen staffing needs. First-year data and performance

¹⁴ [Report of the Independent Panel on the U.S. Department of Health and Human Services \(HHS\) Ebola Response](https://www.phe.gov/Preparedness/responders/ebola/EbolaResponseReport/Pages/default.aspx)
<https://www.phe.gov/Preparedness/responders/ebola/EbolaResponseReport/Pages/default.aspx>.

¹⁵ The number of state- or jurisdiction-designated Ebola treatment centers does not include the regional Ebola and other special pathogen treatment centers.

results from the HPP Ebola cooperative agreement associated with the state of readiness for Ebola treatment centers include the following:

- One-hundred-twelve percent (7,046 of 6,265) of rostered staff¹⁶ in Ebola treatment centers across the U.S. are trained in safely donning and doffing PPE (goal is 100 percent). HPP recognizes that this performance measure may exceed 100 percent because more staff were trained in PPE use than the number of staff pre-identified to care for a patient with Ebola. HPP will assist awardees in understanding how to report this data in future performance years.¹⁷
- Ninety-six percent of Ebola treatment centers met the goal of accessing their PPE supply within 10 minutes of a suspected Ebola patient's arrival.
- Ebola treatment centers averaged approximately 33.7 hours to execute required just-in-time refresher trainings on Ebola care protocols and procedures with their identified treatment staff. Every facility met the 72-hour target.
- Ebola treatment centers averaged 11.8 hours to prepare their facility to be fully ready to admit a suspected patient with Ebola; the goal is 72 hours. Every Ebola treatment center met the 72-hour goal.
- Sixty-five percent, or 4,073 of 6,265, of the rostered staff were contacted by the hospital within four hours of a patient confirmed with Ebola or other special pathogen admitted to a regional Ebola and other special pathogen treatment center (goal is 100 percent).
- Eighty-nine percent, or 3,612 of 4,073, of the contacted rostered staff indicated that they are able to fulfill Ebola-related staffing needs within 72 hours (goal is 100 percent).

In subsequent budget years, HPP will continue to track Ebola treatment center activities to ensure facilities across this tier have and maintain the required capabilities to respond to an Ebola or other special pathogen outbreak. The majority of state- or jurisdiction-designated Ebola treatment centers met the HPP exercise targets in year one. To help these Ebola treatment centers enhance their capabilities for other special pathogens outside of Ebola, the NETEC has developed a special pathogen (airborne) tabletop [exercise template](#).

"The program [HPP Ebola Activities] has had a profound, positive impact through the multiple tabletop, functional and full-scale exercises, and trainings that have been provided as a direct result of the HPP Ebola funding." (HPP Part A awardee)

Ebola Assessment Hospitals

Assessment hospitals are pre-designated facilities that are prepared to receive and isolate a patient under investigation and have the capabilities to care for the patient until an Ebola or other special pathogen diagnosis can be confirmed or ruled out. The HPP FOA recommends that the 18 states/jurisdictions at higher risk for Ebola will have assessment hospitals located within 75 miles of at least 85 percent of their returning traveler populations. All other states/jurisdictions will have at least one assessment hospital.¹⁸ This geographic guidance aims

¹⁶ Rostered staff are individuals that have been pre-identified to provide ongoing care and treatment to patients with confirmed Ebola or under investigation for Ebola.

¹⁷ It is possible that facilities trained a higher number of staff in donning and doffing PPE than the number of staff they identified to provide Ebola care.

¹⁸ [EP-U3R-15-002 Hospital Preparedness Program \(HPP\) Ebola Preparedness and Response Activities FOA](https://www.grants.gov/view-opportunity.html?opId=274709)
<https://www.grants.gov/view-opportunity.html?opId=274709>.

to ensure a sufficient number of facilities are prepared for assessment activities across the regional treatment network.

In the first year of the HPP Ebola cooperative agreement, awardees reported that 217 U.S. hospitals¹⁹ across the U.S. serve as Ebola assessment hospitals. During the first year of the HPP Ebola cooperative agreement, awardees allocated \$26.4 million to support Ebola assessment hospitals.

HPP has seven required performance measures to assure and test readiness at the assessment hospital tier; these measures are primarily tested through exercise. These performance measures are tactical in nature, and test at the facility-level how quickly patients are isolated upon arrival, the accessibility of the proper PPE, and proportion of health care facility and EMS workers in the appropriate PPE that come into contact with the suspected Ebola patient. First-year data and performance results from the HPP Ebola cooperative agreement associated with the state of readiness for Ebola assessment hospitals include the following:

- Assessment hospitals averaged 147 seconds to isolate a patient under active monitoring for Ebola symptoms upon arrival to the facility (goal is 60 seconds); 108 of the reporting assessment hospitals met the 60-second goal.
- Assessment hospitals averaged 8.5 minutes to isolate a patient suspected with Ebola following an emergency department triage, as evidenced by an exercise (goal is five minutes).
- Two hundred two, or 93 percent, of assessment hospitals reported the ability to access their PPE supply within 10 minutes of a suspected Ebola patient's arrival or notification of potential arrival.
- More than 26,000 assessment hospital emergency department staff and nearly 20,000 intensive care unit staff were trained on infection control.

In many cases, the year one data outlined above reflects a facility's first attempt at an exercise that practices an Ebola or other special pathogen event. HPP will continue to administer technical assistance and other educational and exercise support at the assessment hospital tier for the remainder of the five-year cooperative agreement project period.

The NETEC also developed resources, exercises, and templates tailored to assessment hospitals that should facilitate improvement in readiness. Assessment hospitals have access to the NETEC's [tabletop exercise template](#) and [assessment hospital special pathogen \(airborne\) tabletop exercise template](#) to practice skillsets required to respond to an Ebola or other special pathogen outbreak. In the NETEC's second year (2016-2017), assessment hospital representatives made up the largest proportion of in-person training participants (24 percent).

Frontline Health Care Facilities

The overwhelming majority of U.S. acute health care facilities that are equipped for emergency care fall into this tier. In the first year of the HPP Ebola cooperative agreement, awardees reported a total of 4,845 frontline facilities across the U.S. Frontline facilities are acute care centers that are not designated as Ebola assessment hospitals or Ebola treatment centers, but

¹⁹ It is also important to note that per HHS guidance, states and jurisdictions have flexibility in implementing the tiered approach. In some cases, a hospital may be prepared to serve in more than one role. Some hospitals may serve simultaneously as an Ebola assessment hospital and as an Ebola treatment center.

may encounter a suspected Ebola or other special pathogen if a patient were to access the health care system. ASPR requires HPP Ebola Part A funding awardees to include frontline facilities in readiness-building. The most important capabilities for frontline facilities are having the systems and trained workforce in place to initially identify and isolate a patient; understand how to access, don, and doff PPE; and, coordinate transportation for the patient to an assessment or treatment facility. These exact competencies are tested in [NETEC-facilitated exercises](#), which were developed and tailored specifically for frontline facilities participating in an Ebola tabletop exercise or special pathogen (airborne) tabletop exercise.

First-year data and performance results from the HPP Ebola cooperative agreement associated with the state of readiness for frontline health care facilities include the following:

- Eighty-two percent, or 3,690, of frontline facilities received information from their health care coalition on the quantity and location of their PPE supply within eight hours of arrival of a patient under investigation for Ebola at a coalition member facility (goal is 100 percent).
- Fifty-three percent, or 2,572, of frontline facilities received coalition-funded training (goal is 75 percent).

In subsequent performance years, ASPR expects a greater number of frontline facilities to receive information on PPE in the target time period and an increased proportion of frontline facilities to receive coalition-funded training. HPP has adjusted performance measures for budget period two to allow for frontline facility participation in exercises for other special pathogens, which should facilitate enhanced preparedness and response capabilities for emerging infectious diseases other than Ebola.

Health Care Delivery System-Level Readiness

ASPR HPP's *Ebola Preparedness and Response Activities* cooperative agreement have contributed to a marked improvement in the U.S. health care system's overall capabilities to respond to an Ebola or other special pathogen outbreak. Prior to July 2014, nearly 85 percent of HPP's awardees felt "not prepared" or "slightly prepared" for an Ebola event. The most recent available data, as of June 2016, show just over 65 percent of these awardees feel "adequately prepared" or "very prepared" for an Ebola event. The regional Ebola and other special pathogen treatment centers that serve as the regional assets for the network also expressed improved perceptions of preparedness for their regions; the majority of regional treatment centers went from "slightly prepared," before July 2014, to "adequately prepared" as of July 2016. In year one feedback, awardees outlined how HPP *Ebola Preparedness and Response* funding and activities have contributed directly to the development of the desired tiered-hospital approach within their jurisdiction, which will have a secondary impact by improving preparedness for other special pathogens outbreaks at a health care system-level.

While there are defined capabilities tied to each tier of the regional treatment network, it is also important to assess progress of system-level capabilities that enable the entire regional tiered network to safely and successfully identify, isolate, assess, transport, and treat patients with Ebola or patients under investigation for Ebola, and that it is well prepared for a future Ebola or other special pathogen outbreak.

Concept of Operations (CONOPS) Planning

Awardees (both Part A and Part B) are required to report on important planning and exercising activities at the conclusion of every budget period (performance year). HPP reporting

requirements on performance measures promote better tactical planning and encourage awardees to practice proactive self-awareness and accountability due to the objective nature of the measures and associated guidance. Awardee CONOPS strategies must include coordination plans with the regional treatment center, transportation procedures, and communication protocols to notify health care partners and defined roles and responsibilities for each facility tier within that awardee’s jurisdiction. Figure 5 below demonstrates Part A awardee progress in CONOPS planning. These operating planning requirements provide the regional treatment network with a strong foundation.

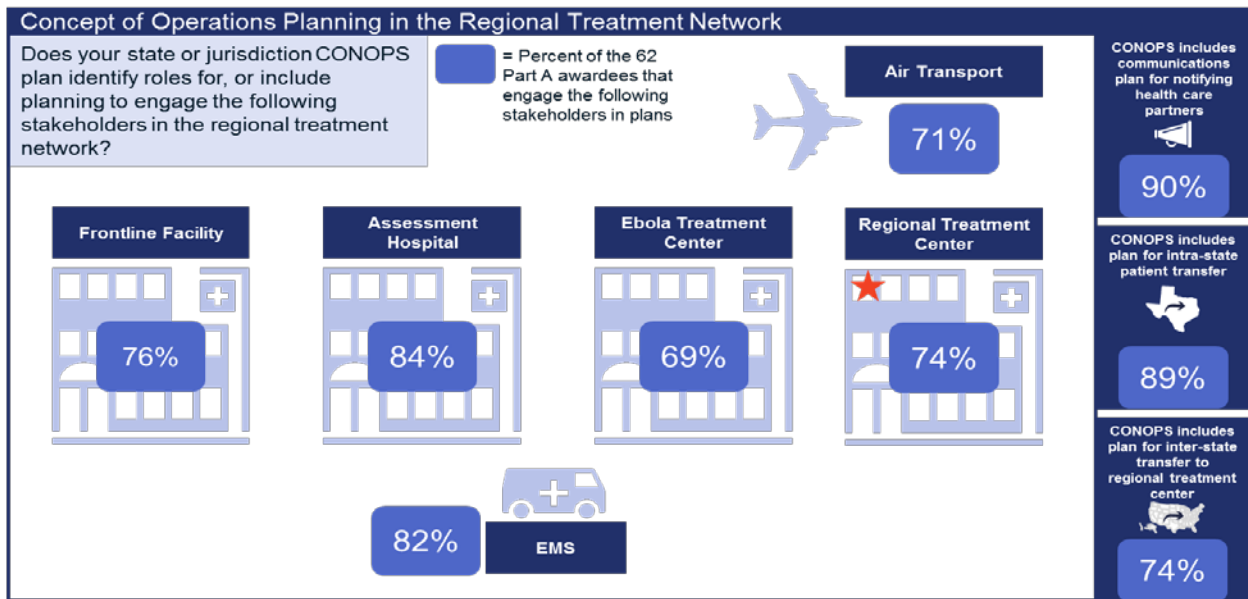


Figure 5: CONOPS Planning in Year One (2015-2016)

Coordination Capabilities

Overall system-level preparedness in the regional treatment network depends on effective communication, collaboration, and coordination within the tiered hospital approach. Awardee feedback provided to HPP points to the connection between ASPR funding, planning, and exercise activities required through the HPP *Ebola Preparedness and Response Activities* cooperative agreement, and better coordination between health care system stakeholders who would need to be activated during an Ebola or special pathogen outbreak. As demonstrated in the CONOPS graphic above, nearly 90 percent of awardees included a communications protocol for notifying health care partners in their operational plans. Awardees have also repurposed existing stakeholder workgroups, or established new ones, to focus on emerging infectious disease preparedness and response activities.

“This system has shown how to effectively integrate hospitals, public health, EMS, and other partners to accomplish increasing the effectiveness and efficiency of the health care system overall.”
(HPP awardee)

“Communications and information sharing capabilities have been dramatically affected to include local and district plans that will increase the amount of communication among and between partners, as well as to determine the kinds of information that can and should be shared within the confines of public health and healthcare to ensure risk to the public and health care workers is held to a minimum.”
(HPP awardee)

In year one, more than 270 health care coalitions across the 10 HHS regions participated in a health care-associated infection (HAI)/infection control advisory group, accounting for 57 percent of eligible health care coalitions in awardee jurisdictions. In subsequent performance years, HPP will work with awardees to

emphasize and assist engagement with HAI/infection control advisory groups to meet a goal participation rate of 80 percent.

This type of institutionalized collaboration has immediate impacts, such as the development of approved CONOPS, scaled trainings, or purchases of PPE, that enable sharing of promising practices for Ebola patient care and workforce preparation within the regional treatment network. Health care delivery system coordination has long-term benefits as well. New awardee and regional health care partnerships built through Ebola preparedness activities may support the maintenance of situational awareness for other emerging infectious disease threats and encourage better coordination within health care systems overall. Health care system coordination is a key overarching capability for which ASPR will continue to assess and support progress in future supplemental funding years.

Transportation Capabilities

With regard to patient transportation, HPP Ebola supplemental funding awardees pointed to challenges with engaging the correct patient transportation stakeholders (e.g., EMS) and accounting for geographic complexities in their transportation planning (e.g., need for air transport, intra-state transport) as a system-wide preparedness gap.

First-year data and performance results from the HPP Ebola cooperative agreement associated with the state of readiness for system-level transportation capabilities include the following:

- Approximately 50 percent of HPP Part A awardees identified issues around transportation as an Ebola preparedness gap.
- Fifty-four percent, or 1,021, of EMS agencies required to execute their jurisdiction's CONOPS were engaged in all phases of the Ebola and other special pathogen preparedness process (goal is 100 percent).
- NETEC identified two specific transport-related gaps: long-distance transport planning related to air versus ground and integration of pre-hospital planning with hospital planning.²⁰

HHS recognizes that the regional treatment network relies on effective transportation plans and engagement of stakeholders to ensure that patients can be transferred safely between hospital tiers. In response to this gap, the NETEC recommended that local stakeholders, including pre-hospital, public health, and hospital clinical and operational leaders, collaborate with state and regional partners to determine the safest and most effective patient transport options. HPP has also worked to develop resources, trainings, and exercises that help close transportation-related gaps. These efforts include the following:

- ASPR Technical Resources, Assistance Center, and Information Exchange (TRACIE) used HPP Ebola funding [to develop targeted EMS Ebola transportation resources](#), including guidance documents (e.g., [EMS Infectious Disease Playbook](#)) and training webinars.

²⁰ [NETEC Annual Report FY 2016](#)

https://netec.org/wp-content/uploads/2017/05/NETEC-Annual-Report-FY-2016_v7_111016-Final.pdf.

- In April 2017, ASPR participated in the [Operation Tranquil Shift](#) exercise to test the ability of the nation's health care system to provide safe medical transport to American citizens infected with Ebola while abroad. In this scenario, a cluster of 11 American health care workers were notionally exposed to Ebola in Sierra Leone. During the exercise, the mock patients were transported back to five of the 10 HPP-funded regional Ebola and other special pathogen treatment centers using specialized biocontainment units. This exercise was funded by the U.S. Department of State, which jointly led the exercise together with ASPR.



Figure 5: Operation Tranquil Shift

- In year two (June 2016-June 2017), the NETEC's facility self-assessments, on-site facility capabilities assessments, and course evaluations clearly identified a need to expand the scope of resources offered by the NETEC for EMS systems. As a result, NETEC leadership established an expert EMS and pre-hospital workgroup to address EMS needs across the NETEC's metrics development, facility assessment, and training and education activities. The role of the EMS and pre-hospital workgroup is to evaluate standard operating procedures and guidelines for patient isolation and transport, increase accessibility of EMS subject matter experts to providers, integrate workgroup members into readiness assessment teams, review existing EMS metrics for infectious disease transport, develop exercises to test EMS protocols, and develop NETEC EMS training materials. Additionally, in year two, the NETEC facilitated [two immersive simulation courses](#) that addressed patient transport.

HPP will continue to support awardees in addressing transportation-specific gaps in the remaining years of its Ebola cooperative agreement funding support. ASPR has also supported planning for Operation Tranquil Terminus, which will occur in late 2017. This exercise will test the domestic air and ground patient movement capabilities of the U.S. health care system by transporting nine patients from assessment hospitals to the regional Ebola and other special pathogen treatment centers. EMS coordination is also tested in HPP-required exercises and in NETEC exercise templates, both of which promote accountability and improvement in this important aspect of the regional treatment network.

Waste Management Capabilities

The House Committee on Appropriations also recognized waste management as a key parameter in its report request to the Department. During the 2014-2015 domestic Ebola outbreak, the U.S. government faced challenges regarding guidance associated with transporting and disposing of Ebola waste. The U.S. Department of Transportation (DOT) regulations classify Ebola waste as a Category A infectious waste, meaning that there are more stringent packaging and waste disposal requirements.

- The Independent Panel on the HHS Ebola Response found that federal, state, and local governments applied different policies and authorities for waste management response measures. The panel found that nationally inconsistent transportation procedures hindered movement of Ebola waste across state borders, and delays in

clarifying Ebola waste packaging requirements caused facility-level waste backlogs.²¹

- During year one, the NETEC identified waste management protocols as a notable gap based on site assessment findings. Specifically, the NETEC identified a serious gap in the lack of defined agreements and protocols for transporting medical waste as Category A infectious substances.

In response to the identified gaps in Ebola waste management, HHS has actively supported the evidence-based interagency CONOPS for waste management related to Category A agents. The U.S. government initiated an extensive interagency coordination effort among ASPR, CDC, the U.S. DOT, the U.S. Environmental Protection Agency, and the U.S. Department of Labor to release [Interim Planning Guidance for the Handling of Solid Waste Contaminated with a Category A Infectious Substance](#).²² The interim planning guidance is for local EMS, hospital, or health care facility personnel, environmental officials, individuals involved in waste management, and federal, state (or, in some jurisdictions, tribal or territorial), or local officials who have to handle, transport, or dispose of waste from a person with a suspected or known exposure to a Category A infectious substance. Interim planning guidance users can reference this document to identify waste management considerations for their locality, develop or update their waste management protocols and plans, and inform worker protection needs.²³

Further activities to close the waste management gaps identified, include:

- HHS and the NETEC will continue to work with facility and transportation stakeholders within the regional treatment network to understand and address any questions stemming from the interim planning guidance. HHS' involvement in developing this guidance will support preparedness for other fatal, infectious diseases that can be transmitted through contaminated waste.
- In collaboration with ASPR and CDC, the NETEC will continue to conduct site assessments and produce targeted educational materials based on identified gaps and areas for improvement related to waste management. In year three, the NETEC plans to develop online courses on waste management, autoclave use, and infection control.
- ASPR TRACIE has developed a topic collection of resources and guidance materials for Ebola [decontamination and waste management](#).

Section IV: Planning and Future Considerations

HPP and NETEC Plans in Support of the Regional Treatment Network

At the time of this report, awardees had just completed their second year of the HPP *Ebola Preparedness and Response Activities* cooperative agreement in support of the regional treatment network (May 2016-June 2017). Year two data was due to ASPR from awardees in September 2017. ASPR expects to complete analysis and validation of these data by late 2017. Many HPP awardees and facilities reported having met the Ebola performance measure goals in the first year. Given the lessons learned during year one, and the Department's desire to strengthen and institutionalize the regional treatment network to prepare for other emerging

²¹ [Report of the Independent Panel on the HHS Ebola Response](#)

<https://www.phe.gov/Preparedness/responders/ebola/EbolaResponseReport/Documents/ebola-panel.pdf>

²² [Interim Planning Guidance for the Handling of Solid Waste Contaminated with a Category A Infectious Substance](#)

https://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Interim_Planning_Guidance_for_Handling_Category_A_Solid_Waste.pdf

²³ Ibid.

infectious diseases, ASPR has developed modified performance measures that allow awardees and facilities to prepare for other special pathogens. To be eligible to start planning and exercising for a scenario other than Ebola, an awardee must successfully test and meet all Ebola performance measures. The NETEC has also proactively worked to release [exercise templates](#) for airborne special pathogens, in addition to Ebola exercise templates. The Department and the NETEC's efforts will help all facility tiers across the regional treatment network maintain, diversify, and strengthen their Ebola and other special pathogen response capabilities.

The NETEC plans to address identified gaps through targeted technical assistance and tailored educational resources, and broaden their scope to focus on special pathogens other than Ebola. The NETEC's expanded and newly established activities²⁴ include:

- Metrics, Readiness Assessment, and Annual Readiness Reports;
- Establish Educational Curricula and Develop Educational Materials, Resources, and Tools;
- Virtual Technical Assistance; and,
- Creation of the Special Pathogens Research Network.

NETEC's newest effort to create a Special Pathogens Research Network demonstrates its ability to incorporate lessons learned and proactively explore system-wide opportunities for improvement in the regional treatment network. In subsequent years, the NETEC will continue to serve as a coordinated public-private partnership to strengthen the nation's health security through preparing health care facilities throughout the U.S. for Ebola and other special pathogens.

Ongoing HHS Ebola Response Improvement Plan Activities

ASPR currently serves as the lead coordinator at HHS for delivering semiannual status reports on the *HHS Ebola Response Improvement Plan (ERIP)*. In this role, ASPR monitors progress on specific Department action items that are relevant to the regional treatment network's capabilities. For example, HHS will incorporate outcomes from an ongoing study by the CDC National Institute for Occupational Safety and Health (NIOSH) on PPE use, burn rate, and stockpiling. Since 2015, NIOSH has collaborated with Vanderbilt University Medical Center, Nashville, Tennessee, and other federal and academic partners to develop a PPE surveillance system to track equipment use and anticipate shortages. In August 2015, the project was expanded to incorporate Ebola PPE use. Findings from this surveillance can inform promising practices for Ebola and other special pathogen PPE storage and use in the regional treatment network.

The *HHS ERIP* also outlines HHS' commitment to determine whether additional strategies could be employed to ensure health care facilities participate in responding to future emerging public health threats. As follow-up on that action, ASPR worked with MITRE and RAND Corporations to conduct a study on the need for a formalized emerging infectious disease network. During the course of this project, stakeholders provided extensive input on whether this health care network could be built on the foundation of the regional Ebola treatment network. The final report is pending and will contain analysis on the strategies required to ensure sufficient geographic distribution, access, and capabilities of health care facilities for an emerging infectious disease outbreak response. ASPR will consider this report's findings and

²⁴ "The National Ebola Training and Education Center: Preparing the United States for Ebola and Other Special Pathogens" *Health Security* Volume 15, Number 3 (2017).

recommendations as it plans future support for the HPP-funded regional treatment network for Ebola and other special pathogens.

Future Considerations

Global trends, such as the increasing mobility of people and products, have contributed to an amplified likelihood of an emerging infectious disease outbreak.²⁵ Recent international incidents of emerging infectious disease outbreaks, such as Lassa fever cases in West Africa and an Ebola outbreak in the Democratic Republic of the Congo, illustrate the continued risk of an imported special pathogen incident in the United States and highlight the need for maintained readiness to respond. In the event of a future special pathogen threat, hospitals will most likely be the first place that new disease threat is recognized.

The tiered, regional treatment network developed following the 2014-2015 Ebola outbreak is a foundational asset to the nation's health security and has proven to be applicable to other special pathogens and emerging infectious diseases.

In 2015, a New Jersey hospital used HPP funds to effectively and safely manage a viral hemorrhagic fever-Lassa fever patient from time of admission to decedent management. Zero hospital staff who came into contact with the Lassa patient became infected. This case illustrates how HPP-funded training and equipment investments prepare for emerging infectious diseases other than Ebola.

When asked to describe the impact of the HPP *Ebola Preparedness Response Activities* funding on overall preparedness for an Ebola or other special pathogen event, more than a third of Part A and Part B awardees explained how HPP has had tangible impacts on their health

"The focus on Ebola has been a catalyst for improved infection prevention and control practices for all infectious diseases (not just Ebola). Awareness of patient screening techniques, and the need to continue asking travel questions for all infectious diseases worldwide has been acknowledged and embraced throughout the health care and public health community." (HPP awardee)

care system's preparedness for other special pathogens and infectious disease readiness overall. Many of these awardees credited the Ebola outbreak's visible impact on the U.S. health care system as a catalyst for enhanced preparedness measures.

The Department recognizes that initial momentum and awardees' rapid buildup of required response capabilities will require continued attention to maintain and improve capabilities. Predictable forces, such as the need for equipment maintenance and replacement of PPE used in exercises and turnover of trained and

pre-identified staff, will be a challenge for facilities at all tiers across the regional treatment network. HPP's initial emergency funding stream has proven critical in developing the foundational capabilities for the regional treatment network; sustained funding will be just as important to maintain and build upon accomplishments.

²⁵ [Globalization and infectious diseases: A review of the linkages.](http://www.who.int/tdr/publications/documents/seb_topic3.pdf)
http://www.who.int/tdr/publications/documents/seb_topic3.pdf

In the Independent Panel Report on the HHS Ebola Response, the outside panel of experts found that the U.S. government did not anticipate the complications associated with establishing Ebola treatment centers and other domestic preparedness measures. Many facilities were initially resistant to volunteer for treatment center designations because of public perception and lost revenue concerns. These barriers, which HPP activities helped mitigate through its supplemental funding, highlight the need to maintain the progress that has been achieved in institutionalizing the regional tiered approach.²⁶

Sustained funding would support ongoing education and capability maintenance activities at the frontline and assessment hospitals that serve as the nation's first line of defense. State- and jurisdiction-designated Ebola treatment centers and the 10 regional Ebola and other special pathogen treatment centers also require a funding stream to continue their progress in developing and maintaining advanced capabilities. Additionally, the HPP-funded NETEC requires ongoing funding to continue its role as the key convener of these hospital tiers and as the platform for collaborative development of innovative strategies to improve preparedness for Ebola and other special pathogens.

“Continuing education, personnel hours dedicated to donning and doffing properly have been a notable detriment once funding is no longer offered for these purposes. Daily operational needs will drive the training of personnel instead of the ever continuing threats from worldwide disease concerns. Ongoing support to infectious disease preparedness is strongly encouraged but may not be embraced due to the daily budgetary constraints.” (HPP awardee)

The HPP Ebola supplemental funding has been instrumental in establishing the regional treatment network, and continued federal investment will ensure that readiness gains are maintained and enhanced in preparation for future emerging infectious disease outbreaks.

Appendix A: HPP Ebola Preparedness Measures Year One Results

The Ebola Measures

There are 26 core Ebola measures that address both Part A (18 measures) and Part B (eight measures). The data to support these measures will be collected by the awardee, coalitions, Ebola treatment centers, and assessment hospitals for Part A, and the awardee and the regional Ebola and other special pathogen treatment center for Part B. While the measures primarily aim to address health care workforce training and patient care, much of the data will be collected during training, exercises, and real-world events. Per the FOA, the awardee, coalitions, Ebola treatment centers, and assessment hospitals must conduct annual exercises, and regional Ebola and other special pathogen treatment centers must conduct quarterly exercises. To ensure these exercises result in sufficient data for each measure, NETEC develops exercise templates. These exercise templates are shared publicly and are accessible to awardees, coalitions, and individual health care facilities to assist in capturing the required metrics.

- [2015 HPP Measure Manual: Implementation Guidance for Ebola Preparedness Measures](#)

²⁶ [Report of the Independent Panel on the HHS Ebola Response](http://www.phe.gov/Preparedness/responders/ebola/EbolaResponseReport/Documents/ebola-panel.pdf)
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Year One (2015-2016) Results

Year one results are presented below as they were reported to HPP in year one of the cooperative agreement. Year one results are reported as a national average or aggregated to provide a national proportion. As this was the first year of the HPP *Ebola Preparedness and Response Activities* cooperative agreement, and the regional treatment network was stood up in a compressed timeframe, there were certain challenges that reflect in select performance measure results, which are noted in the tables below. HPP continues to work with its awardees to streamline, clarify, and provide technical assistance on the objectives of the cooperative agreement and on the required data reporting elements.

Develop a CONOPS

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
1	A	Time, in minutes, it takes from an assessment hospital's notification to the health department of the need for an inter-facility transfer of a patient with confirmed Ebola to the arrival of a staffed and equipped EMS/inter-facility transport unit, as evidenced by a no-notice exercise (Goal: within 240 minutes or four hours).	Coalition or assessment hospital exercise or real event	148 minutes

Assure Readiness of Ebola Treatment Centers

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
2	A	Proportion of rostered staff that are trained in safely donning and doffing PPE (Goal: 100%).	Ebola treatment center measure	7,046/6,265 (112%) ²⁷
3	A	Time, within hours, it takes for all rostered staff, upon notification of a patient with Ebola at the regional Ebola and other special pathogen treatment center, to receive just-in-time training (Goal: within 72 hours).	Ebola treatment center exercise or real event	33.7 hours
4	A	Time, within hours, until an Ebola treatment center is ready to admit a patient with Ebola as evidenced by an exercise or actual patient transfer (Goal: within 72 hours of confirmation of an Ebola patient at a regional center).	Ebola treatment center exercise or real event	11.8 hours

²⁷ It is possible that facilities trained a higher number of staff in donning and doffing PPE than the number of staff they identified to provide Ebola care.

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
5	A	Proportion of rostered staff contacted by a hospital within four hours of a patient with confirmed Ebola's admission to a regional Ebola and other special pathogen treatment center (Goal: 100%).	Ebola treatment center exercise or real event	4,073/6,265 (65%)
6	A	Proportion of rostered staff contacted that indicated they are able to report to fulfill Ebola-related staffing needs within 72 hours (Goal: 100%).	Ebola treatment center exercise or real event	3,612/4,073 (89%)
7	A	Proportion of Ebola treatment centers that can access their PPE supply (e.g., know location and have sufficient quantity of unexpired supply) within 10 minutes of patient with suspected Ebola transfer notification or upon the patient's arrival (if no notification) (Goal: 100%).	Ebola treatment center exercise or real event	78/81 (96%)

Assure Readiness of Ebola Assessment Hospitals

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
8	A	Time, in seconds, from active monitoring/direct active monitoring (AM/DAM) patient's arrival to placement in isolation at assessment hospital (Goal: <60 seconds).	Assessment hospital exercise or real event	147 seconds
9	A	Time, in minutes, it takes an assessment hospital to identify and isolate a patient with Ebola or other highly infectious disease (e.g., Middle East Respiratory Syndrome, measles, etc.) following emergency department triage, as evidenced by a real-world case or no-notice exercise (Goal: within five minutes).	Assessment hospital or coalition exercise, or real world event	8.5 minutes
10	A	Proportion of health care and EMS workers in PPE that an AM/DAM suspected Ebola patient under investigation (PUI) makes contact with after health department notification to the assessment hospital or Ebola treatment center (Goal: 100%).	Assessment hospital exercise or real event	407/531 (77%)
11	A	Number of health care and EMS workers in PPE that an AM/DAM suspected Ebola patient makes contact with after health department notification until isolation (Goal: <3).	Assessment hospital exercise or real event	Four health care and EMS workers in PPE

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
12	A	Proportion of emergency department staff trained at least annually in infection control and safety (Goal: 100%).	Assessment hospital measure	26,167/26,706 (98%)
13	A	Proportion of intensive care unit staff trained at least annually in infection control and safety (Goal: 100%).	Assessment hospital measure	19,640/20,991 (94%)
14	A	Proportion of assessment hospitals that can access their PPE supply (e.g., know location and have sufficient quantity of unexpired supply) within 10 minutes of a patient with suspected Ebola transfer notification or arrival, if no notification (Goal: 100%).	Assessment hospital exercise	202/217 (93%)

Develop HPP Capabilities to Enable their Members to Care for a Patient with Ebola

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
15	A	Proportion of frontline facilities that receive information from their coalition on the quantity and location of PPE supply within eight hours of a PUI's arrival at a coalition member facility (Goal: 100%).	Coalition exercise	3,690/4,845 (76%)
16	A	Proportion of frontline facilities that have received coalition-funded training (Goal: 75%).	Coalition measure	2,572/4,845 (57%)
17	A	Proportion of EMS agencies that are required to execute the awardee's CONOPS that are engaged in all phases of the Ebola and other special pathogen preparedness process (Goal: 100%).	Coalition and awardee measure	1,021/1,892 (54%)
18	A	Proportion of coalitions within an awardee's jurisdiction that participate in the HAI/Infection Control advisory group (Goal: 80%).	Awardee measure	270/482 (56%)

Supporting Regional Planning for the Development of a Regional Network for Ebola Patient Care

Region 9 did not have a Part B awardee in year one of the HPP Part B cooperative agreement.

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
19	B	Time, within minutes, from confirmation of patient with Ebola at assessment hospital or Ebola treatment center to notification by the health department and/or transferring hospital (assessment hospital or Ebola treatment center) to the health department in the state/jurisdiction where the regional Ebola and other special pathogen treatment center is located about the need for patient transfer (Goal: within 30 minutes).	Assessment hospital or Ebola treatment center exercise	19.4 minutes
20	B	Proportion of member states/jurisdictions in the region that have participated in the development of the regional CONOPS (Goal: 100%).	Part B awardee measure	48/50 (96%)
21	B	Proportion of states/jurisdictions in the HHS region for which a current written and signed agreement is in place to transfer patients from assessment hospitals or Ebola treatment centers to the regional Ebola and other special pathogen treatment center (Goal: 100%).	Part B awardee measure	27/50 (54%)
22	B	Proportion of states/jurisdictions in the HHS region that have demonstrated the ability to move a patient across jurisdictions by ground or air to a regional Ebola and other special pathogen treatment center, as evidenced by a real-world event or participation in a multi-jurisdiction exercise (Goal: 100%).	Part B awardee measure	30/50 (60%)

Developing, Supporting, and Maintaining Regional Ebola and Other Special Pathogen Treatment Centers

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
23	B	Proportion of rostered staff at the regional Ebola and other special pathogen treatment center that received quarterly training in infection control and safety and patient care for a patient with Ebola (Goal: 100%).	Regional Ebola and other special pathogen treatment center measure	570/584 (98%)
24	B	Time, within hours, it takes for the on-call team to report to the unit upon notification of an incoming patient with Ebola, as evidenced by a real-world event or no-notice exercise (Goal: four hours).	Part B exercise or real event	2.3 hours

Number	HPP Part	Measure	Data Source	Year One Result (national average or proportion)
25	B	Proportion of rostered staff contacted by the regional Ebola and other special pathogen treatment center within four hours upon notification of an incoming patient with Ebola, as evidenced by a real-world event or no-notice exercise (Goal: 100%).	Part B exercise or real event	641/584 (110%) ²⁸
26	B	Time, within hours, until a regional Ebola and other special pathogen treatment center is ready to admit a patient with confirmed Ebola (adult or pediatric patient), as evidenced by an exercise or actual patient transfer (Goal: within eight hours of notification).	Part B exercise or actual patient transfer	4.5 hours

HPP Ebola Performance Measures Glossary

All phases of the Ebola and other special pathogen preparedness process: All Phases includes planning, training, exercising, and responding with other Ebola preparedness partners.

Actively monitored or directly actively monitored (AM/DAM): Active monitoring means that the state or local public health authority assumes responsibility for establishing regular communication with potentially exposed individuals, including checking daily to assess for the presence of symptoms and fever, rather than relying solely on individuals to self-monitor and report symptoms if they develop. Direct active monitoring means the public health authority conducts active monitoring through direct observation.

Assessment hospital: Pre-designated facilities that are prepared to receive and isolate a PUI for Ebola virus disease and care for the patient until an Ebola diagnosis can be confirmed or ruled out and until discharge or transfer is completed.

Confirmation: Laboratory-confirmed diagnostic evidence of Ebola virus infection.

Contact: The hospital successfully contacted the staff member (and received a response) by phone, email, or automated call-back system.

Doffing: The removal of used PPE; this is a high-risk process that requires a structured procedure, a trained observer, and a designated area for removal to ensure protection.

Donning: The administration or act of putting on PPE.

EMS agencies required to execute the awardee’s CONOPS: EMS agencies that will provide 9-1-1 emergency medical services to suspected Ebola patients’ homes or other locations. Inter-facility EMS agencies that will transport suspected or confirmed patients with Ebola between frontline health care facilities, assessment hospitals, Ebola treatment centers, regional Ebola and other special pathogen treatment centers, and airports.

²⁸ It is possible that facilities contacted a higher number of staff than the number identified to provide immediate Ebola care.

EMS/inter-facility transport unit: EMS agencies are those identified in the awardee's CONOPS to transport an AM/DAM patient to an Ebola assessment facility or to provide inter-facility transport (e.g., from a frontline facility to an Ebola assessment/treatment facility or from an Ebola assessment facility to an Ebola treatment facility).

Frontline facility: Frontline facilities are hospitals and other health care providers that are not designated Ebola assessment hospitals or Ebola treatment centers but have the possibility of an encounter with a patient with suspected Ebola if the patient were to access the health care system outside of the AM/DAM program.

Healthcare-associated infection (HAI)/infection control advisory group: An advisory committee charged with making recommendations on the prevention of health care-associated infections.

Infection control and safety: Policies and procedures used to minimize the risk of spreading infections, especially within health care facilities.

Inter-facility transport providers: Staff that support the transport between two entities, for example, between an assessment hospital and an Ebola treatment center.

Isolation: Precautions that are taken in a health care facility to prevent the spread of an infectious agent from an infected or colonized patient to susceptible persons. Isolation practices can include placement in a private room or with a select roommate, the use of protective barriers such as masks, gowns and gloves, and special handling of contaminated articles.

Just-in-time (JIT) training: Training that is conducted as a refresher to prepare for a patient with Ebola, including donning and doffing, facility-specific protocols and procedures, and care/treatment protocols.

No-notice exercise: Exercise that is given unannounced.

Notification: The definition of notification may vary relative to the context of the measure.

On-call team: Group of individuals that are pre-designated to staff the Ebola treatment unit at the time of the patient's scheduled arrival.

Participation: The involvement in the development, implementation, or sustainment of the regional CONOPS.

PPE: Devices or equipment designated to provide protection while providing care for a confirmed or suspected patient with Ebola.

PPE Access: The ability to identify the location and have sufficient quantity of unexpired supply of PPE at the patient care location (e.g., emergency department, intensive care unit, Ebola treatment unit).

Sufficient: The extent to which the availability of PPE supplies meets the pre-identified needs (e.g., CDC guidelines, needs assessment, CONOPS).

Rostered staff: Individuals pre-identified to provide patient care for patients with confirmed Ebola.

Trained: Individuals who have completed Ebola infection control and safety training to specifically include proper donning and doffing methods. ([CDC Ebola Personal Protective Equipment \(PPE\) Donning and Doffing Procedures](#))

Transfer agreement: Written, signed document that denotes a formal willingness to transfer patients from assessment hospitals or Ebola treatment centers to regional Ebola and other special pathogen treatment centers.