NETEC
NATIONAL EBOLA TRAINING
& EDUCATION CENTER



Annual Report **FY2019**

Funded by the U.S. Department of Health and Human Services Assistant Secretary for Preparedness and Response (ASPR) and the Centers for Disease Control and Prevention (CDC)

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NETEC

INTRODUCTION

The National Ebola Training and Education Center (NETEC) funded by the Assistant Secretary for Preparedness and Response (ASPR) and the Centers for Disease Control and Preventions (CDC) was established to prepare the nation to respond to all high consequence pathogens. NETEC helps hospitals and public health throughout the United States (U.S.) combat infectious diseases such as the 2019 novel Coronavirus, Lassa Fever, Ebola virus, and Middle East Respiratory Syndrome Coronavirus by leveraging unique expertise, resources, and experience. NETEC is a consortium of three institutions that successfully treated patients with Ebola virus disease: Emory University, University of Nebraska Medical Center and New York City Health + Hospitals / Bellevue. NETEC assesses and assists health care facility readiness, educates and trains providers, provides real-time technical assistance, and builds a rapid response research infrastructure in the U.S.

Mission

To increase the capability of United States public health and health care systems to safely and effectively manage individuals with suspected and confirmed special pathogens.

Assessment

Empower hospitals to gauge their readiness using **Self-Assessment**

Measure facility and health care worker readiness using **Metrics**

Provide direct feedback to hospitals via **On-Site Assessment**

Education

Deliver didactic and hands-on simulation training via **In-Person Courses**

Provide self-paced education through **Online Trainings**

Technical Assistance

Provide **Onsite and Remote Guidance**

Compile **Online Repository** of tools and resources

Develop customizable **Exercise Templates** that are based on the HSEEP model

Provide **Emergency On-Call Mobilization**

Research Network

Build **Central IRB Process** for rapid implementation of clinical research protocols

Develop Policies, Procedures, and Data Capture Tools to facilitate research

Create infrastructure for a **Specimen Biorepository**

Cross-Cutting, Supportive Activities

Continue to Develop Partnerships

Build and Expand Expertise and Program Infrastructure

NETEC BY THE NUMBERS FY15 – FY19

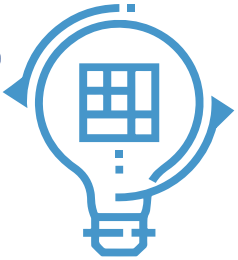
ACHIEVEMENTS

87 facility readiness consultation visits

32 states, the District of Columbia and six U.S. territories represented at in-person trainings

98 in-person educational activities held, including didactic and skills training courses, simulation courses, webinars, technical assistance sessions and conference presentations

6,525 have participated in NETEC educational activities



47% of in-person course participants were RNs. Other participant credentials included MPH, MD, Paramedic, and EMT.





1,408 Skills Videos views



14 online education courses offered

9 online courses, with 7,744 enrollments
5 skill videos, 1,361 views via YouTube

7,847 total course enrollments for Online Education through the Learning Management System (LMS)





1ST Special Pathogens Research Network simulation of an emergency clinical trial for the treatment of patients with Ebolavirus infection



17 countries convened for the International Workshop on High-Level Isolation Units



24 | 7 | 365 phone line established for emergency consultation with federal partners and healthcare facilities requiring assistance with patients suspected of or proven to have infections with special pathogens

HEALTH CARE FACILITIES READINESS CONSULTATIONS FOR SPECIAL PATHOGENS

What is a Readiness Consultation?

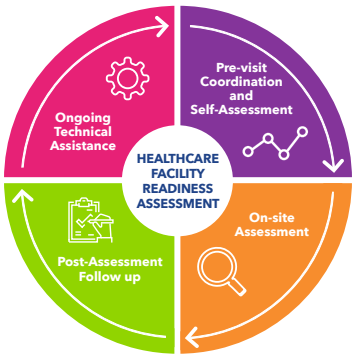
The purpose of NETEC's readiness consultations is to support healthcare facilities in their preparedness to respond to special pathogens. NETEC's health care facility readiness consultation process starts with the completion of a health care facility self-assessment, followed by an on-site consultation conducted by NETEC and RESPTC subject matter experts (SMEs) to validate self-assessment findings and provide in-depth feedback. Post visit follow-up provides the opportunity for targeted technical assistance and continuous improvement (figure to right).

In 2018-2019 NETEC conducted readiness consultations at 25 facilities across 20 states in the U.S. The Health Care Facility Self-Assessment enables self-reporting of key domains/areas prior to NETEC site consultations. NETEC readiness consultation teams use the Facility Capabilities Assessment while onsite to optimize data collection of their observations and link these observations with readiness metrics. The information obtained via self-reporting and onsite provides NETEC with an overview of both individual facility and national readiness, identification of key gaps and strengths by domain. This dual approach is a key component that enhances collaboration with designated facilities. Aggregate findings from readiness consultations are utilized by NETEC to inform development of training, exercise templates and technical assistance resources.

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.

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. 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.
- 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.

NETEC Readiness Consultation Tools

Healthcare Facility Self-Assessment — Health care facilities assess their readiness with 146 metrics in 11 domains.

Facility Capabilities Assessment — NETEC teams conduct on-site readiness consultations to indicate operational readiness across 12 domains of facility infrastructure and performance.

HEALTH CARE FACILITIES READINESS CONSULTATIONS FOR SPECIAL PATHOGENS



Regional Ebola and Other Special Pathogens Treatment Centers

Regional treatment center personnel participated in readiness consultations across the regional network as well as on intra-regional consultations.

The value of the expanded integration of RESPTC personnel into NETEC readiness consultations and other regional activities is illustrated in the incorporation of shared best practices into individual programs as seen across the RESPTC network. Ongoing engagement and leveraging the collective expertise of the RESPTC network will considerably advance readiness efforts for Ebola and other special pathogens (ESP) across the entire tiered network in the nation.

Feedback received from readiness consultation satisfaction surveys

ASSESSMENT HOSPITAL

"It was such a great experience! The team was able to answer all our questions 'in-time.' It was so great to hear their experiences and learn from the experts. I am so happy the team was able to meet with each of our units and all our simulations. We have already made adjustments based on their recommendations."

ASSESSMENT HOSPITAL

"We were very impressed with the knowledge, experience and delivery of recommendations by the NETEC team. The team members had both experience and knowledge, which gave us confidence in the information they were sharing with us. We will be making changes to our doffing area, PPE and use of our patient rooms as a result of the consultation. We very much appreciate the site visit and are excited to implement the recommendations moving forward. We appreciate the pre-hospital SME and all the expertise he provided our EMS partners. Thank you all!"

EBOLA TREATMENT CENTER

"Very helpful, all the staff were great to work with, very respectful, seem to enjoy their work a lot which makes the whole process easier. Put our team at ease, had open and honest discussion. Found the visit to be very helpful, gained a lot of insight."

REGIONAL TREATMENT CENTER

"Our NETEC site visit was exceptional. All involved brought such professionalism and expertise. The feedback we received was both practical and thoughtful. Including members from other regional centers definitely enhances the experience. there is no doubt these visits improve our preparedness. We look forward to having NETEC visit again next year."

REGIONAL TREATMENT CENTER

"The readiness consultation is an invaluable asset to improve our state of readiness and advance our capabilities around caring for highly infectious pathogen patients. The teams are always collaborative and invested in really evaluating our program."

HEALTH CARE FACILITIES READINESS CONSULTATIONS FOR SPECIAL PATHOGENS

2018-2019 hospital readiness consultations were tailored to the needs of each facility. Unique considerations in the agendas included an expanded focus on pre-hospital preparedness, special pathogens other than Ebola, and facility preparedness efforts outside designated biocontainment units (e.g. emergency departments and other points of entry). Tailored agendas for each designated RESPTC allowed NETEC to provide more focused consultative services while onsite.

RESPTC Preparedness for Other Special Pathogens

NETEC faculty collaborated with subject matter experts across the RESPTC network, ASPR and CDC to identify unique elements which should be included in facility and team preparations to provide care for patients with other special pathogens, such as novel respiratory viruses, that may warrant care in a biocontainment unit. All RESPTCs readiness consultation agendas allowed time for an increased focus on these distinct elements.

The RESPTC facilities concentrated efforts on expanding capabilities for identification and management of patients suspected or confirmed to have infections with special pathogens other than Ebola, particularly respiratory viruses. Through readiness consultations and regional network working groups NETEC has identified that providing care for these patient populations may introduce additional complexities in some preparedness capabilities such as personal protective equipment utilization and personnel management. However, some of the unique challenges encountered when caring for patients with Ebola Virus Disease or other viral hemorrhagic fevers such as waste management and laboratory capacity, have been found to be more easily mitigated when managing patients with respiratory viruses.



YEAR 4 ACCOMPLISHMENTS

- Regional treatment center personnel inclusion in readiness consultations was expanded to include representation in intra-regional consultations as well as at each regional treatment center.
- Developed considerations unique to airborne transmitted pathogens to be included in the Facility Capabilities assessment for regional treatment center readiness consultations.
- NETEC expanded the number of readiness consultations conducted through focused outreach with ASPR field project officers (FPOs).
- NETEC developed and piloted an Emergency Medical Services self-assessment tool and complementary on-site readiness consultation tool to advance the preparedness of agencies.
- Included frontline facilities in technical assistance and readiness consultation activities as requested.

YEAR 5 GOALS

- Identify and maintain a roster of trained personnel from each regional treatment center to participate in readiness consultations.
- Finalize and disseminate the Facility Capabilities Assessment inclusive of airborne transmissible pathogen considerations.
- Continue to increase the number of readiness consultations conducted each year.
- Finalize and disseminate the Emergency Medical Services instruments.
- Expand the volume of readiness consultations and technical assistance visits for Emergency Medical Services.
- Create a frontline facility self-assessment tool in collaboration with public health partners; local, state and federal.

Overall Findings



* data set includes 23 designated facilities

HEALTH CARE FACILITIES READINESS CONSULTATIONS FOR SPECIAL PATHOGENS

Readiness Consultation Findings

2018-2019 on site readiness consultation data demonstrates a consistently higher level of operational readiness for RESPTCs when compared to state designated ETCs and Assessment Hospitals. The RESPTCs continue to integrate innovative strategies to sustain and advance preparedness for ESP. Novel approaches seen this year include:

- Expansion of the use of media, augmented reality and technology to enhance training for biocontainment unit staff.
- Collaborating with the private industry to design and manufacture more effective, safe and comfortable personal protective equipment.
- Incorporating human factors research and evaluation methods into training and exercise programs.

Training and Exercises demonstrated the highest level of operational readiness across the RESPTCs. Key themes identified as strengths in this domain include:

- Expansion of Just in Time training strategies and materials for rostered staff and other key personnel.
- Increasing frequency and complexity of operations-based exercises to include advanced technical skills, other special pathogens and collaboration with internal and external stakeholders.
- Implementation of train-the-trainer strategies into rostered staff training programs.
- Integration of no-notice drills for the identification of PUIs in emergency departments.

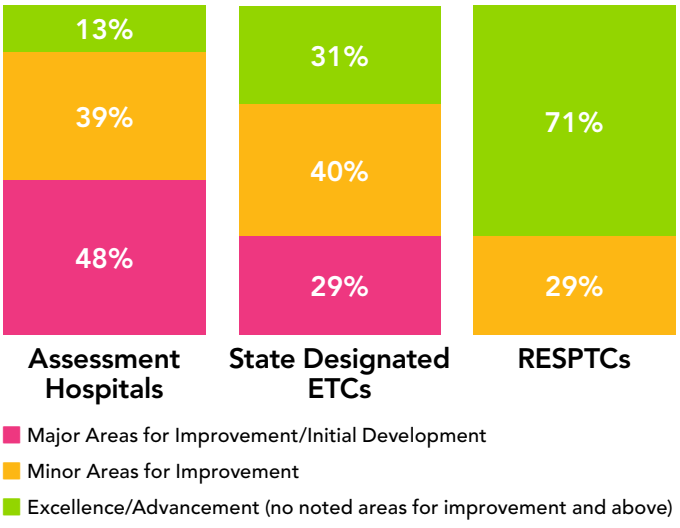
Hospital emergency management demonstrated the highest level of operation readiness across non-RESPTC facilities. Key themes noted include:

- Collaboration between emergency management personnel and special pathogen program leadership.
- Ebola and other special pathogen response procedures are incorporated into hospital incident command structures.
- Incorporation of emergency management principles to facilitate effective response.
- EMS and 911 PSAPS are truly frontline and work in progress to provide consultations for frontlines and EMS.

The recognition of similar principles and the ability to leverage established emergency management programs has enabled state designated facilities develop more effective response capabilities for ESP.



OPERATIONAL READINESS OF ALL DOMAINS BY TIER OF FACILITY



RESPTC Readiness Consultation Findings

In addition to training and exercises, the RESPTCs were noted to be most prepared in the following domains. Key themes identified include:

Pre-Hospital

- Partnerships between RESPTCs and designated Emergency Medical Services (EMS) agencies were strengthened due to additional opportunities for collaboration in regional transport exercises resulting in refined protocols for hand off procedures between EMS and hospital staff.
- Local and state public health and EMS partner engagement with the RESPTCs have led to improved communication strategies and strengthening of local and regional planning efforts for patient transportation.

Research

- Expanded integration of research personnel into biocontainment unit programs noted during RESPTC consultations.
- Multiple RESPTCs have included components of research and the use of investigational therapeutics into their operational based exercises.

Physical Infrastructure

Enhancement of multiple biocontainment unit spaces within the RESPTC network. Notable advancements included:

- Improvement of audio/visual capabilities within designated unit spaces.
- Identification of additional spaces within RESPTCs to provide care for up to 10 patients with respiratory pathogens that warrant biocontainment care.
- Inclusion of visual cues to show the demarcation of hot, warm and cold zones within designated units.

Domains that represent the top priorities for advancement across RESPTCs are:

Collectively, the 10 RESPTCs showed advancement across the lowest performing domains from last year including Laboratory, Infection Control, Waste Management and Treatment and Care. However, challenges continue to be seen in the following areas:

Laboratory

- National challenges remain in the ability of RESPTCs to transport laboratory specimens to the CDC or reference laboratories.

RESPTC OPERATIONAL READINESS BY DOMAIN

RESPTCs Yr 4 | 10 Facilities
Viral Hemorrhagic Fevers (VHF) Domains



Infection Control

- The increased focus on emergency department preparedness demonstrated opportunities for staff members outside of dedicated ESP teams to improve personal protective equipment (PPE) donning and doffing techniques.
- Vendor design changes in PAPR hoods used by several of the RESPTCs have created challenges which have required significant protocol changes to safely and effectively utilize this equipment.

Waste management

- RESPTCs' increased focus on facility preparedness in emergency departments and at other points of entry where patients may present revealed opportunities to further develop plans for the segregation, storage and processing of waste generated in other areas of the facility.
- Opportunities identified for the need to continue efforts for autoclave testing and validation particularly regarding treatment of solidified liquids.

Treatment & Care

- While NETEC observed advancement in the overall capability to provide comprehensive care, including critical care interventions, for adult and pediatric patients, it was noted that limitations exist in the number of trained staff that specialize in neonatal and labor & delivery specialties.

HEALTH CARE FACILITIES READINESS CONSULTATIONS FOR SPECIAL PATHOGENS

State Designated ETC Readiness Consultation Findings

State designated ETCs demonstrated the highest operational readiness in the following domains:

Physical Infrastructure:

- Identification of appropriate existing space in emergency departments and designated biocontainment units to provide care for patients with ESP/VHF that includes negative pressure capability to improve airborne infection isolation capacity.
- Customization of existing spaces to augment ability to provide care for patients with ESP that included installation of improved audio/visual technology.
- Application of administrative and engineering controls to facilitate unidirectional flow.

Infection Control

- Personal protective equipment selected for use considers transmission routes and recommended guidance to safely provide care for ESP.
- Donning and doffing protocols for use of PPE were well established and rostered staff noted to be able to demonstrate understanding of sequence and rationales for each step.
- Although the Infection Control Domain was noted as one of the overall top performing domains for state/jurisdictional ETCs, significant opportunities for improvement were noted for environmental infection control components, specifically daily and terminal cleaning processes.

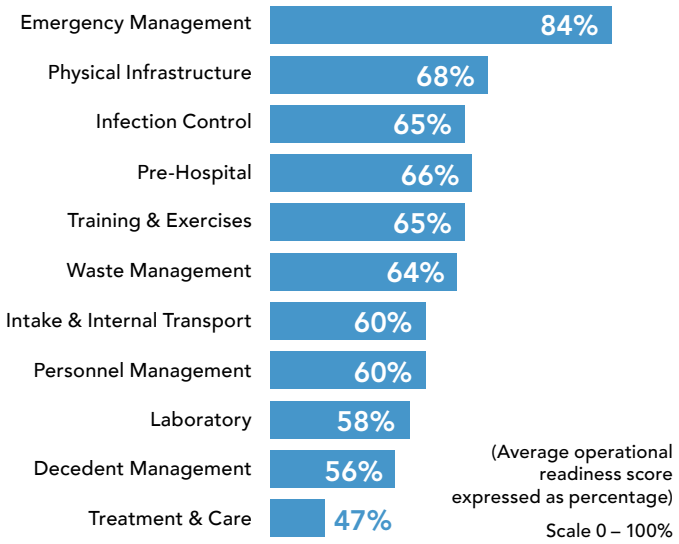
Domains that represent the top priorities for advancement across State Designated ETCs are:

Treatment and Care

- Limited availability of clinical staff to provide comprehensive care for adults, pediatrics, neonatal and labor & delivery populations that may require biocontainment care.
- Opportunities identified to clarify expectations on level of care that will be provided to patients who require isolation care.
- Opportunities identified to expand training sessions and content for clinical providers who will provide care for patients who require isolation care; including invasive procedures, infection prevention and control principles and other care delivery skills.

STATE DESIGNATED ETCS OPERATIONAL READINESS BY DOMAIN (PERCENT READY)

ETCs Yr 4 | 5 Facilities VHF Domains



Laboratory

- Protocols for IPC practices in the laboratory space including delineation of work zones, PPE doffing and waste management need refinement.
- Clarification on availability of clinical tests at state public health labs is needed. Clinical tests eg. electrolytes, or diagnostic testing (eg. rule in / rule out Ebola).
- Clarification and development of processes for specimen tracking from collection to destruction needed.

Personnel Management

- Opportunities to expand the number of rostered staff on designated teams.
- Roles and responsibilities of team members staffing the biocontainment units need to be better developed and defined.

Assessment Hospital Readiness Consultation Findings

Assessment hospitals were noted to have opportunities for advancement in the following capabilities:

Personnel Management:

- While there are defined processes to maintain logs of staff who participate in the care of a PUI or patient requiring isolation, facility level post-exposure protocols require additional development.
- Rostered staff have been identified; however, staffing models for sustained provision of care (e.g. up to 96 hours) require additional development.
- Further clarification of roles and responsibilities between facilities and public health partners for active-health care worker monitoring is needed.

Intake and Internal Transport

- Strong collaboration with public health partners
- Travel history and symptom screening processes have been developed and implemented when warranted for emergency department triage and registration areas. Expansion of these protocols to other points of entry was noted to be a key area for further development.
- Established communication and notification processes and structures that incorporate existing institutional technologies.
- The limited availability of Airborne Infection Isolation Rooms (AIIRs) at all points of entry for timely isolation was also noted to be an area for further development.

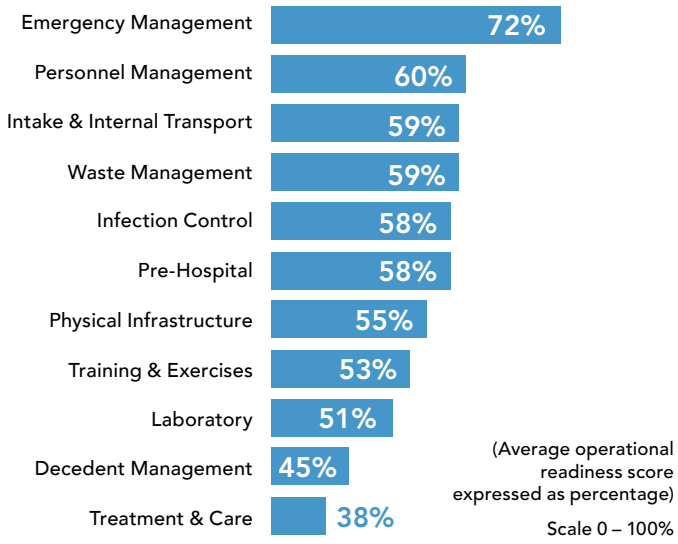
Domains that represent the top priorities for advancement across Assessment Hospitals are:

Treatment & Care

- Limited number of physicians identified as rostered staff.
- Significant limitations in the number of available staff who are trained to provide care for pediatric, neonatal and labor & delivery patients.
- Opportunity to more clearly define expectations with public health and facilities on the level of care that can safely be provided for all ages.

ASSESSMENT FACILITIES OPERATIONAL READINESS BY DOMAIN

Assessment Hosps Yr 4 | 8 Facilities VHF Domains



Laboratory

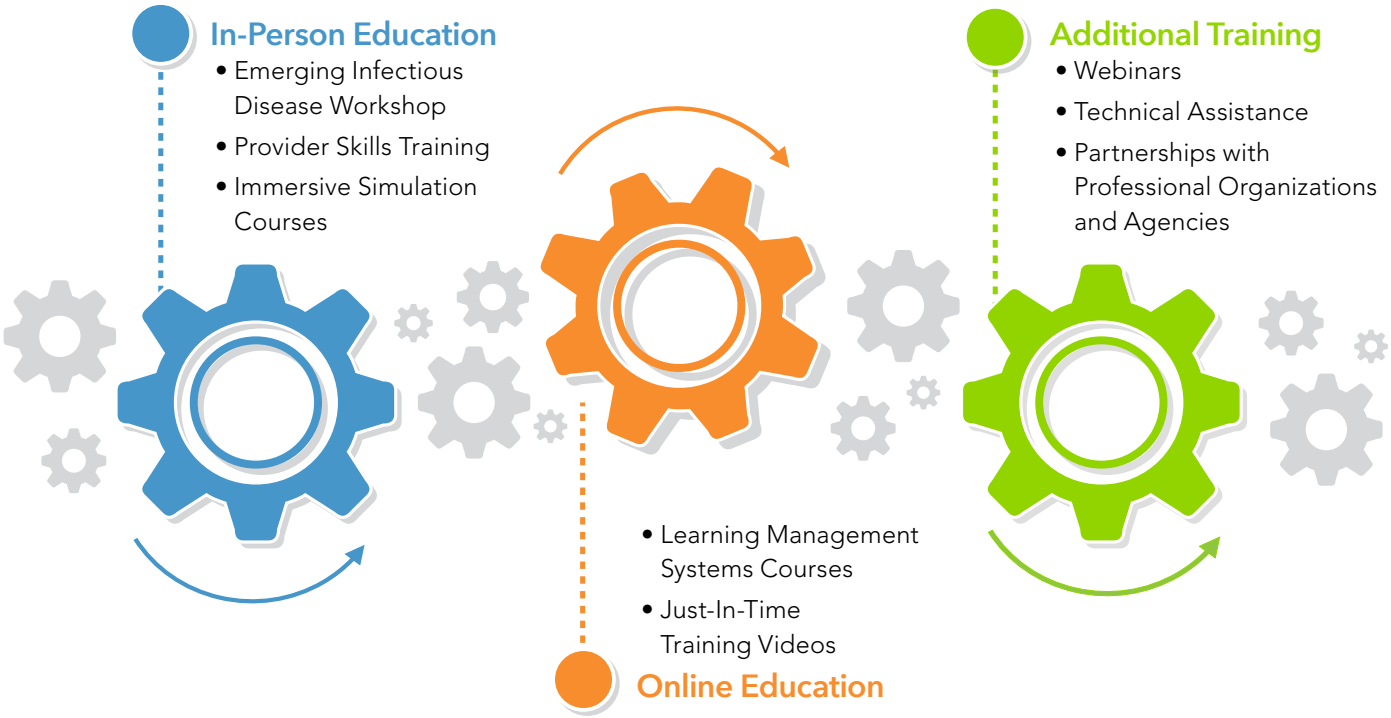
- Lab testing menus do not consistently include all the CDC minimum testing recommendations.
- Gaps identified in practices for specimen tracking and transportation.
- Limited incorporation of laboratory personnel into training programs.

The decedent management domain was also noted to have significant gaps across state designated ETC s and assessment hospitals, however, based on the non-urgent nature of preparing the remains of deceased individuals, and the resources currently available for facilities to access JITT, NETEC would prioritize addressing the gaps in other domains in order to advance overall national preparedness to safely and effectively manage individuals with suspected and confirmed special pathogens.

EDUCATION AND TRAINING

NETEC continues to provide education through a variety of modalities.

In FY19, 3,080 individuals from across the country attended a training. For individuals who were unable to attend the in-person trainings or webinars, NETEC's learning management system in Canvas and Just-in-Time training videos on YouTube have been made available.



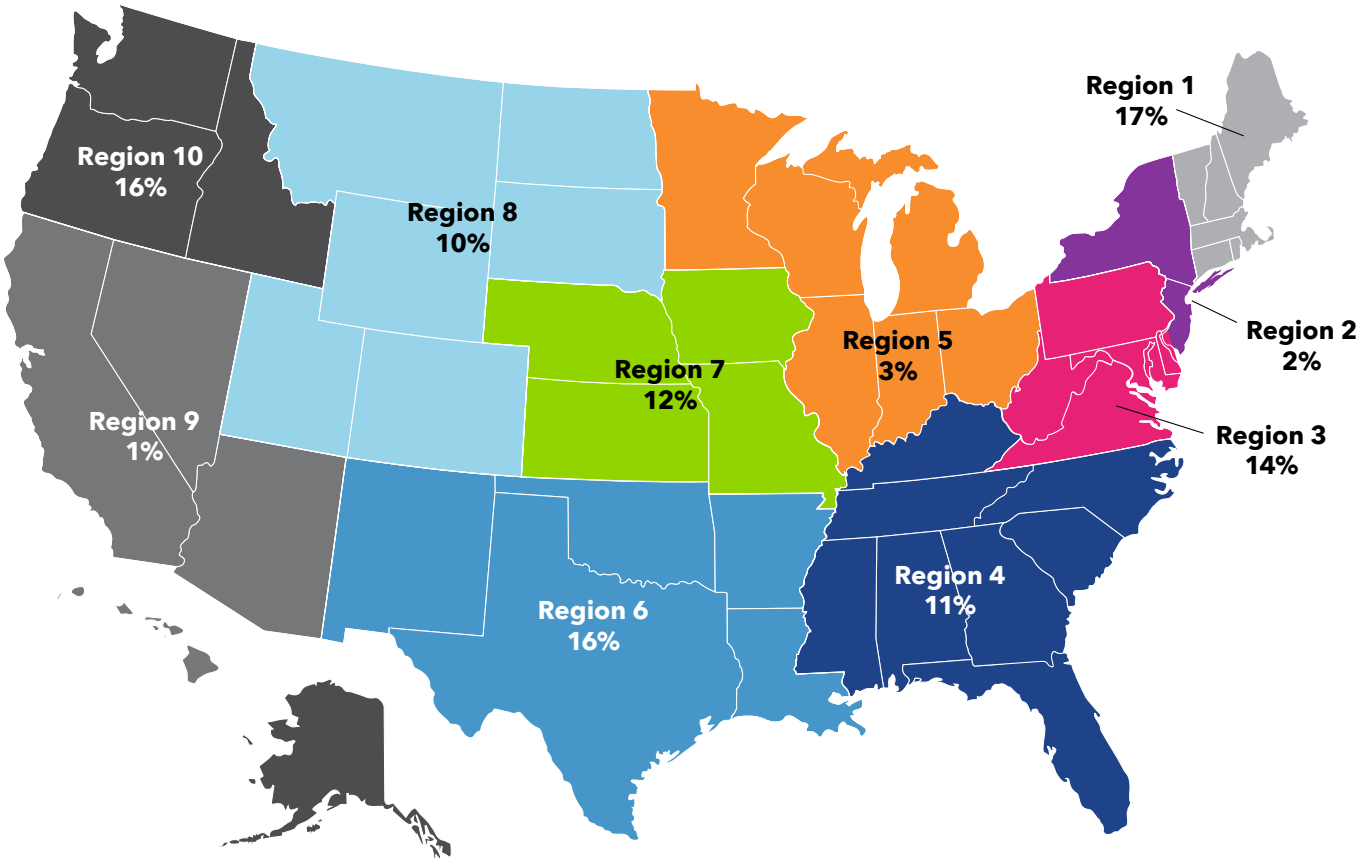
SUMMARY OF EDUCATIONAL ACTIVITIES		
Type of Education	**Number Held**	**Participants Reached**
In-Person Emerging Infectious Disease Preparedness Workshops	7	772
Immersive Simulation Courses	2	64
Provider Skills Training	3	37
In-Person Technical Assistance	19	1331
Webinars	2	366
Conference Presentations	4	510
TOTAL	**37**	**3080**

Live Training

In FY19, NETEC offered three types of in-person training, including an Emerging Infectious Diseases Workshop, a Provider Skills Training, and an Immersive Simulation Course in New York City, N.Y. NETEC collaborated with many of the RESPTCs and traveled across the country to provide in-person educational offerings. Personnel from each Health and Human Services (HHS) region and many disciplines participated in trainings. Forty-two percent of in-person course participants were nurses. Other attendees included emergency medical services providers, physicians, public health and laboratory personnel. Other roles include infection prevention, emergency management, management/administration.



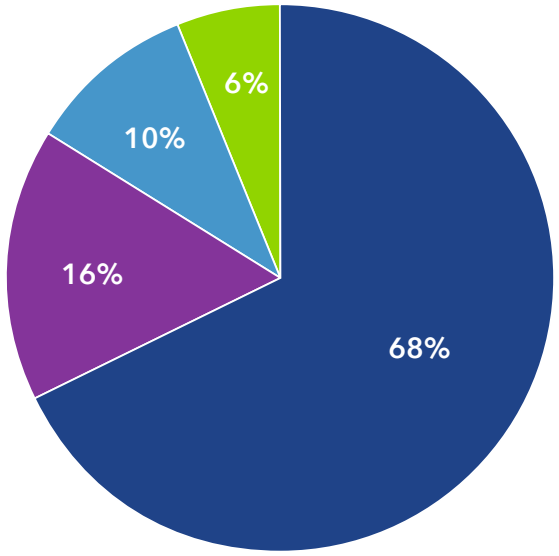
IN-PERSON TRAINING PARTICIPANTS BY HHS REGION (N=842)



EDUCATION AND TRAINING

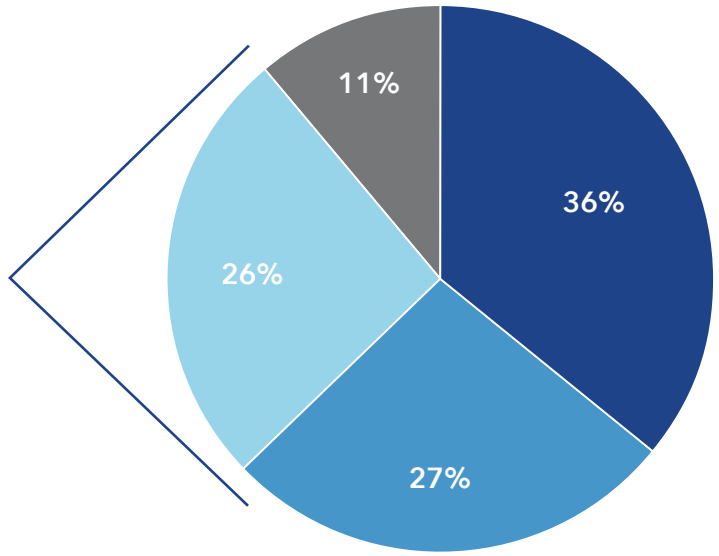
THE MAJORITY OF PARTICIPANTS WERE FROM HEALTH CARE FACILITIES

Participants also represented pre-hospital, government and other sectors.



Health Care Facilities
Government agencies
Pre-hospital
Other

Participants from health care facilities represented the four faculty tiers.



Assessment Hospital
Frontline Hospital
Regional Ebola Treatment Center
State Ebola Treatment Center





Emerging Infectious Disease Preparedness Workshops

NETEC led seven in-person two-day workshops in FY19 providing 772 participants from across the country with information, resources, networking opportunities, and hands-on practice. The workshops were held throughout the country, including:

- Atlanta, Ga.
- Baltimore, Md.
- Boston, Mass.
- Denver, Colo.
- Omaha, Neb.
- San Antonio, Texas
- Spokane, Wash.

These workshops offered participants a combination of lecture, discussion-based learning, and hands-on skills to prepare participants to manage patients with ESP. Topics covered included pathogens of concern, PPE, handling of persons under investigation, laboratory, clinical skills, leadership strategies, emergency management, transport and EMS, pediatrics and other special populations. Participants were provided with the opportunity to choose sessions specific to their roles.

BALTIMORE WORKSHOP

"I cannot express enough how fruitful this workshop was… It was great to have a forum to come together, learn what other teams are doing well, what questions they had for us, and really have an exchange."

– RN from Region 3

SPOKANE WORKSHOP

"I think it is a very good idea to have lab, clinicians, EMS, and leadership come together and discuss this issue… in order to make the overall process run more smoothly."

– Laboratorian from Region 7

BOSTON WORKSHOP

"I actually will be making changes to our polices and equipment based on what I learned in this course with reference to PPE, patient transfers between Hospital and EMS, and the use of ISOPODS."

– Paramedic from Region 1

DENVER WORKSHOP

"I appreciated the openness of all of the presenters and other facilities that gave feedback on multiple issues. I would love to see more information that relates to this topic become available for future needs as they arise."

– Infection Preventionist from Region 6

EDUCATION AND TRAINING

SIMULATION COURSE

"We are building a professional development day, and trying to enhance staff's knowledge, but more than that, build in team-building and recognition."

– Manager, State Ebola Treatment Center

EMERGING INFECTIOUS DISEASE WORKSHOP

"[We] perform more mock drills and continued education."

– EMS Provider

EMERGING INFECTIOUS DISEASE WORKSHOP

"We have modified the physical location and flow of potential contagious patients to minimize operational disruptions and impact on other workflow."

– Clinical Care Director, Assessment Hospital

PROVIDER COURSE

"We modified several protocols related to personnel management with the aim of safely caring for a patient with a special pathogen. These include modifying our PPE ensemble, our occupational health clearance process, and our nurse recruitment and retention process."

– Clinical Care Director, State Ebola Treatment Center

Provider Skills Training

Three provider-specific hands-on training were held in concurrence with the in-person workshops, reaching 37 participants. These trainings focused on care considerations and skills for advanced practice providers and physicians when caring for patients with ESP, and offered participants a combination of lecture, discussion-based learning, and hands-on skills. Topics covered included care of persons under investigation, ethical considerations, managing a deteriorating patient, and clinical skills like intubation, point of care ultrasound, and central venous catheter placement.

Immersive Simulation Courses

Two simulation courses held in New York, NY. These courses gave 64 participants a two-day in-depth hands-on practice of skills essential to safely care for patients with ESP. Simulation courses offered participants the opportunity to practice in full PPE for three to four hours at a time. Participants rotated between skills stations and immersive scenarios. Among the immersive scenarios and skills practiced were patient transfer in collaboration with EMS, agitated patient, health care provider emergency, intravenous line insertion and obtaining specimens, spill cleanup, urinary catheter insertion, nasopharyngeal swabbing, and the use of portable patient isolation units.

In-Person Training Outcomes

Six months following each in-person training, NETEC sends a follow-up survey to course participants to assess training outcomes. About three-quarters of survey responders report making changes at their facility as a result of attending a NETEC training. The most commonly reported changes include adjustments related to:

- Emergency management practices.
- Infection control practices.
- Protocols and procedures related to patient treatment and care.
- Training and drills across the continuum of patient care.
- Physical infrastructure of the unit or facility.

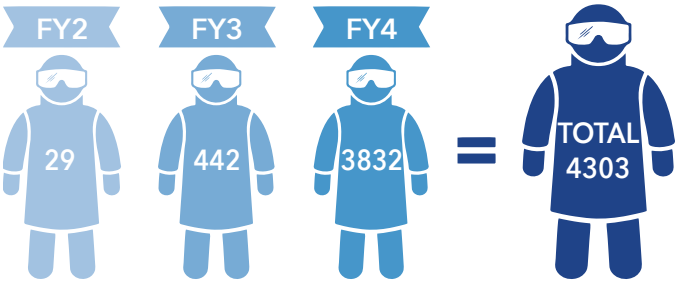
Online Learning

Online Learning Management System

NETEC continues to offer online courses, with eight courses currently available and 13 additional courses under development. In FY19, NETEC saw 7847 course enrollments in the learning management system (LMS) from previous years.

NETEC has partnered with the TrainingFinder Real-time Affiliate Integrated Network (TRAIN) is a learning network from the Public Health Foundation, which has integrated NETEC's online educational offerings into their LMS. The TRAIN Learning Network is a national network that provides thousands of quality training opportunities to more than two million public health, health care, behavioral health, preparedness and other health professionals. Powered by the Public Health Foundation (PHF), the TRAIN Learning Network brings together agencies and organizations in the public health, health care and preparedness sectors to disseminate, track and share trainings for the health workforce on a centralized training platform. NETEC has partnered with TRAIN to provide access to NETEC's library of online courses. Learners can now search the TRAIN database for training opportunities, locate NETEC courses, and enroll directly in the NETEC eLearning Center via links at www.train.org. TRAIN learners come from all U.S. states and territories, as well as 177 countries throughout the world. Anyone can register as a learner on TRAIN at no cost and access thousands of openly available course offerings, the majority of which are free.

LMS ENROLLMENT BY FISCAL YEAR



AVAILABLE NOW
Behavioral Health Considerations for Patients and Health Care Workers
Identify, Isolate, Inform: Assessment, Management and Placement of a Person Under Investigation
Special Pathogens of Concern: Understanding Special Pathogens of Concern and Implications for Health Care Delivery in a Biocontainment Unit
Special Pathogens of Concern: Ebola Virus Disease
Special Pathogens of Concern: Middle Eastern Respiratory Pathogens
Internal Communications
Overview of Clinical Research
Infection Control Procedures for Special Pathogens

COMING IN 2019-2020
Behavioral Health 201: PsySTART
Considerations for the Safe Management of Human Remains Infected with Ebola or Other Special Pathogens
Pediatric Considerations in the Care of Ebola or Other Special Pathogen
Labor and Delivery Considerations is the Care of Ebola or Other Special Pathogen
PPE 101: protecting our Frontline Healthcare Workers
Process and Documentation of Informed Consent for Subjects Involved in Research
Emergency Management: Elements of Discussion-based and Operations-based Exercises
Waste Management Considerations in Special Pathogen Isolation Areas
Elements of Safe Autoclaving Processes in the Management of Category A Waste
Special Pathogens of Concern: Crimean Congo Hemorrhagic Fever Virus
Special Pathogens of Concern: Lassa Fever Virus
Special Pathogens of Concern: Marburg Virus
Special Pathogens of Concern: Plague (*Yersinia pestis*)

ELECTRONIC RESOURCES

Just-in-Time Skills Videos

In FY19, NETEC deployed Just-in-Time training videos that allow participants to easily access and review content in the moment if a patient with ESP presents to their health care facility. There are four videos currently available on YouTube with additional topics to be launched in the upcoming fiscal year.

AVAILABLE NOW
Containment Wrap
Portable Isolation Unit (PIU)
Endotracheal Insertion and Removal
Central Venous Catheter Insertion
COMING IN 2019-2020
Changing a Wet Patient
Peripheral IV Insertion
Urinary Catheter Insertion and Removal
Laboratory Specimen Collection
Spills in the Special Pathogen Isolation Area



Webinars

NETEC co-hosted two educational webinars attended by 366 people.

Presentations at Professional Organization Conferences

NETEC faculty delivered four presentations at conferences, reaching an additional 510 people. These conferences were hosted by national and state-level professional organizations, including the National Disaster Medical System, Emergency Nurses Association and Georgia Emergency Nurses Association. Topics covered included facility preparedness, infection control and patient care.

Collaboration with Federal Partners

NETEC continues to support multiple federal agencies on educational opportunities, including the Centers for Disease Control and Prevention (CDC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), ASPR TRACIE and the Center for Domestic Preparedness (CDP). NETEC is collaborating with CDP to provide accurate and up to date training for health care and public health workers across the country for the Highly Infectious Disease Course in Anniston, Ala.

Additional NETEC Training Offerings

Targeted Technical Assistance

NETEC faculty delivered 19 in-person sessions in 16 different states, impacting more than 1300 people. These technical assistance sessions were tailored to the needs of states and individual facilities. Examples include exercise evaluation support in Colorado, Nebraska, and Vermont; presentations on Pathogens of Concern in Idaho, Maryland and Tennessee; and Leadership Strategies in New Jersey and Wisconsin; and hands-on personal protective equipment training in Hawaii, Kentucky and North Carolina.

In addition, NETEC provided 14 virtual technical assistance for locations including Alabama, Alaska, California, Colorado, Florida, Georgia, New Jersey, Michigan, Texas and Washington. Topics included review of standard operating procedures, personal protective equipment checklists, biocontainment unit design, pediatrics and leadership strategies.

Online Repository

As an open-source tool, the repository provides a unique, single information resource for all end-users from frontline facilities, EMS, RESPTCs and regional transport partners. NETEC.org delivered around 10,000 downloaded resources to facilities and health care workers throughout the U.S.

Two interactive features are new this year. A "Special Pathogens Timeline" which describes significant special pathogen events in recent history as well as an "Ebola Timeline" which details the 2014 Ebola outbreak and the development of the ASPR/CDC-supported network of health care facilities preparing for the next outbreak.

While there is an easy-to-use repository-wide search functionality, users can also browse four key categories:

- **Discover:** offers background on special pathogens, patient care, and keeping people safe.
- **Develop:** provides tools for facilities to develop their own plans using advanced training, examples and guides.
- **Implement:** delivers a variety of items to implement and test plans using exercise templates, checklists and other resources.
- **Explore:** allows users to browse all repository subjects and items to inspire next steps.

Furthermore, the repository now includes full translation functionality to English, French and Spanish and easy-to-navigate drop down menus.

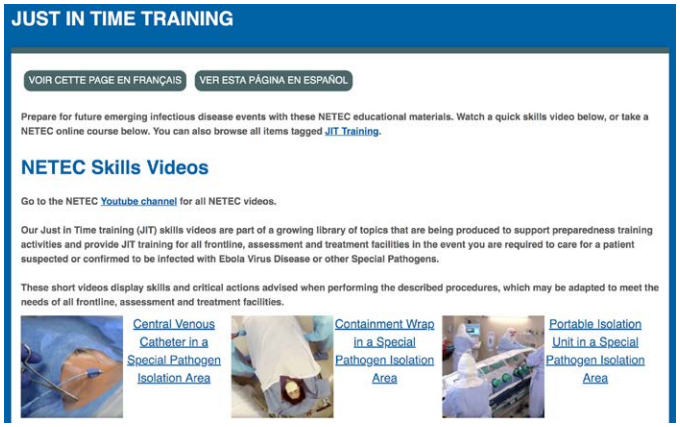
Full-scale exercise resources continue to be the most popular downloads.

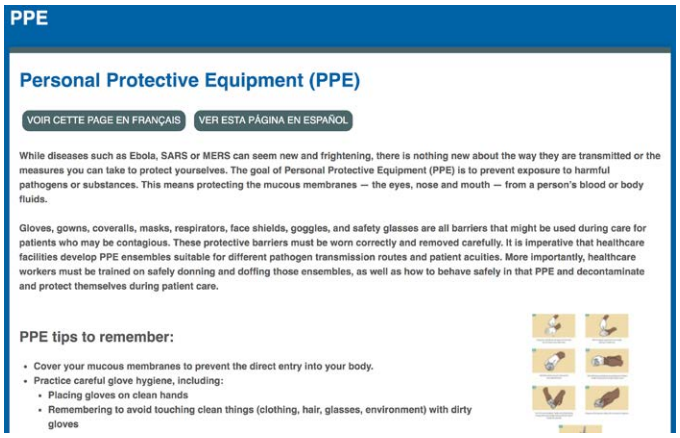
Expertly Curated Resources

In 2019, NETEC added five exhibit pages, collecting a curated set of resources on a specific subject with explanatory text developed by subject matter experts. These exhibits provide further guidance and context for using resources in the repository.

NETEC Exercise Resources

A considerable need across public health and health care delivery partners is for standardized, customizable tools to develop, conduct, evaluate and improve discussion- and operations-based special pathogens exercises. NETEC continues to meet this ever-changing need with the development of dozens of exercise templates, ranging from a mystery patient drill toolkit to a robust full-scale exercise document suite for RESPTCs.





ASPR and CDC continue to ensure that NETEC tools align with Hospital Preparedness Program metrics and enable users to align their exercise activities with the Homeland Security Exercise Evaluation Program.

24/7/365 On-Call Mobilization

NETEC and CDC conducted a joint communications drill to test their collective 24/7/365 on-call capabilities to address the urgent clinical consultation needs of stakeholders nationwide. Of note was the ability for CDC to seamlessly inform internal departments of the request and to quickly integrate communications across NETEC and the requesting clinical facility via conference call to discuss the scenario. Next steps are to continue to review and reinforce processes to ensure the availability of these critical information partners.

EMERGENCY MEDICAL SERVICES RESOURCES





As frontline providers in the truest sense of the phrase, the EMS community remains keenly aware of the unique needs necessary to safely and effectively care for suspected or confirmed patients with ESP. NETEC's work with and support of the pre-hospital community continues to grow with a variety of efforts in education, technical consultation, and metrics development. For example, NETEC partners have collaborated to create an EMS Readiness Assessment tool spanning 48 capabilities across 10 performance domains.

Renowned EMS SMEs continue to share their experience-based guidance at technical assistance requests in Colorado, Oklahoma, Idaho and Montana, among others. Their support has included on-line education, in-person presentations on EMS clinical and operational considerations and participation in the conduct and evaluation of tabletop exercises.

Further, NETEC continues to offer EMS-specific didactic and skills sessions in national training workshops in cities such as Baltimore, Ma. and Denver, Colo. Topics range from operating in the pre-hospital environment, safely donning and doffing PPE, and cutting-edge procedures to clean and disinfect EMS vehicles.

To ensure the broad dissemination of this invaluable information, NETEC continues to host the biosafety transport forum, a national group of experts who convene regularly via listserv and webinars to present and discuss vexing topics and innovative solutions in the pre-hospital arena. Webinars have included EMS organizations from Boston, Mass. to Minneapolis, Minn.

NETEC SPECIAL PATHOGEN RESEARCH NETWORK

Building Infrastructure for Research

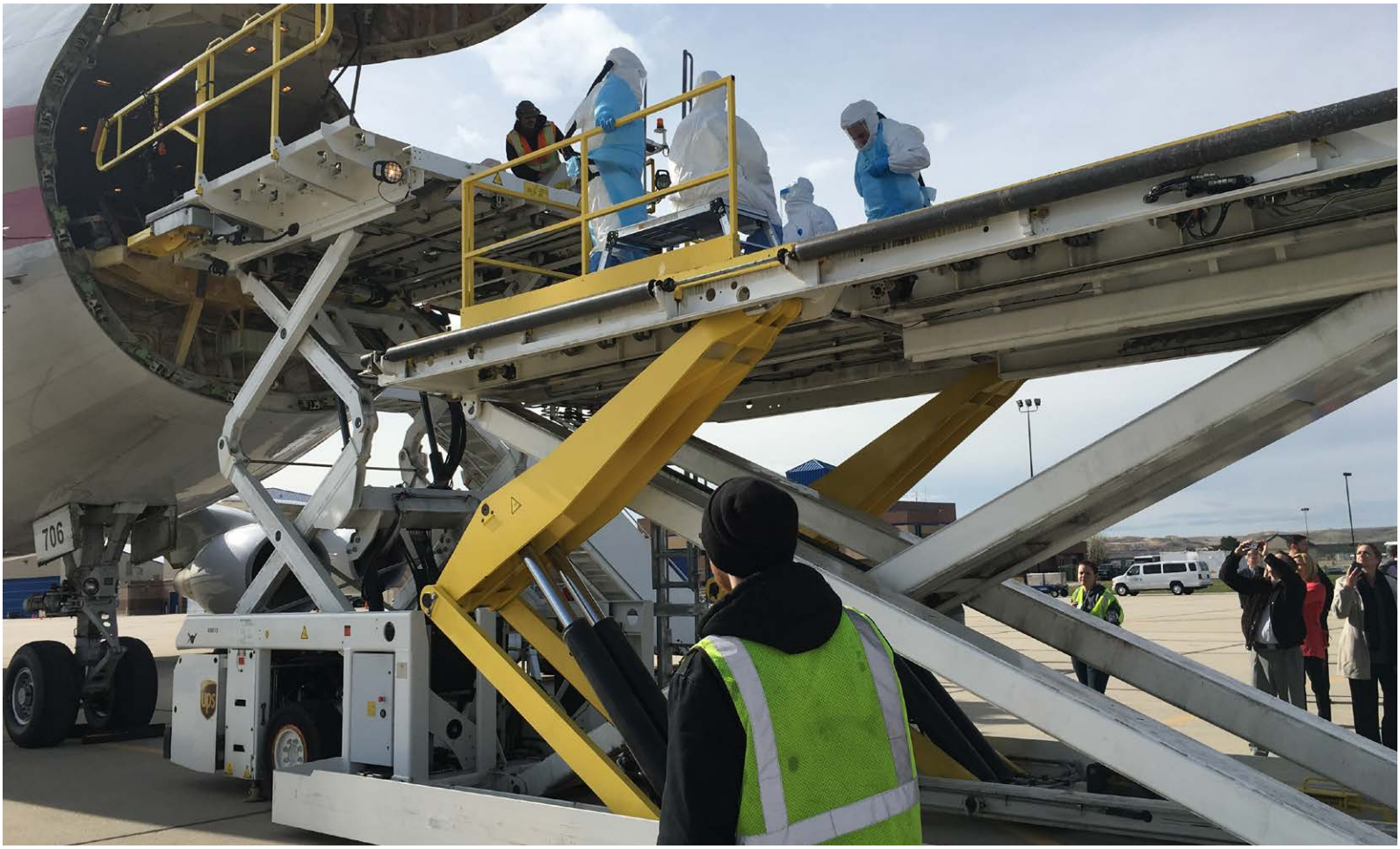
The World Health Organization (WHO) was first alerted of an outbreak of Ebola virus disease (EVD) in the eastern region of the Democratic Republic of the Congo (DRC) on August 1, 2018. It is now the second largest EVD outbreak on record, and violence in the region has prevented containment of the disease spread in the region. This outbreak reminds us of the importance of the Special Pathogens Research Network (SPRN), which was established in November 2016 with a mission to build a national infrastructure to conduct rapid, coordinated, multi-site research in partnership with the ten RESPTCs. We have achieved that overarching goal. The focus of our work in the past year has been on adapting to the current environment with a focus on ways to improve our efficiencies and processes, to implement experimental protocols expeditiously, and to standardize the collection of clinical data in order to advance the understanding of clinical syndromes and therapeutic options for patients with ESP.

All of the original ten SPRN deliverables have been achieved or are in process with ongoing reassessment required for maintenance of goals achieved. Key deliverables are shown below, divided up into three aspects: network engagement, infrastructure readiness, and training readiness.

KEY DELIVERABLES OF THE SPECIAL PATHOGENS RESEARCH NETWORK

Deliverables	Description
Network Engagement	• Engage the ten regional centers in a research network. • Engage federal research partners to coordinate research initiatives. • Hold an annual investigators' meeting with the clinical research teams from regional treatment facilities and other domestic and, as able, international partners to develop protocols and research resources.
Infrastructure Readiness	• Create a master protocol for research. • Develop and operationalize a central Institutional Review Board. • Develop universal case report forms and questionnaires that include clinical, virologic, and immunologic data. • Develop a web-based clinical data capture tool and database with the capability of collecting and coordinating data from the research network and conducting rapid analyses to provide feedback that informs therapeutics and clinical management. • In collaboration with ASPR and CDC, create policies and procedures for a biorepository focused on special pathogens.
Training Readiness	• Develop and implement a training protocol for research staff at regional treatment centers, emphasizing special issues pertaining to emerging pathogens. • Develop model uniform policies and procedures for the conduct of clinical research in biocontainment units.

NETEC SPECIAL PATHOGEN RESEARCH NETWORK



Network Engagement

The SPRN has regular dialogue with the ten RESPTCs through its different working groups. The SPRN also has ongoing collaborations with federal partners through the Partner Working Group and External Advisory Committee. Those organizations represented on the committees include representatives from the Biomedical Advanced Research Development Authority (BARDA), CDC, FDA, NIAID, DoD's Infectious Disease Clinical Research Program (IDCRP) and USAMRIID. These partners provide strategic consultation, ideas for network opportunities, and ideas related to research priorities. Quarterly newsletters are distributed that include relevant topics for the RESPTCs related to the network and outbreaks of interest.

Infrastructure Readiness

The SPRN maintains a constant awareness of ongoing outbreaks that might impact the network through organizations such as the WHO and network partners. The outbreak of the Eboal virus disease (EVD) in the DRC has garnered particular attention and awareness to be prepared for a patient to arrive for care in the network at any given time. This preparedness has taken several forms:

1. **Research Preparedness:** This year, a research protocol that uses a cocktail of three monoclonal antibodies (ZMapp) for treatment of EVD has been approved at all ten sites, with site initiation visits completed at nine of ten sites across the network. This allows the network to provide this treatment to an EVD patient at any moment. A second contingency protocol, sponsored by the NIAID, has been approved by the central IRB.



This protocol is a randomized controlled trial that includes four investigational therapeutics against EVD. This protocol aligns countermeasure options in the U.S. with the same countermeasures being offered to EVD-infected patients in the DRC. This reliance agreement model also allows other institutions to respond more rapidly through reliance on the central IRB should a patient with EVD arrive at a different institution than one of the 10 RESPTCs. It is this level of flexibility and the ability to be a resource for other centers that makes this network so unique.

2. **Research Opportunities:** We continue to look for new opportunities to engage in relevant research and formed a subset group within the Medical Countermeasures (MCM) Working Group of the SPRN to assess the research proposal and funding landscape. This has already led to collaborations on two proposals that were submitted this year: 1) partnering with a network to conduct research on emerging infectious diseases and 2) assessing a phone application that could assist with outbreak management. We will learn about whether these have been selected for funding in the new year. Additionally, we maintain an ongoing dialogue with the Discovery Prep Network for multi-site research.

3. **Evidence-based Summaries for Emerging Infectious Diseases:** The MCM Working Group continuously reviews the literature and drafts evidence-based summary manuscripts on potential countermeasures for seven emerging infectious diseases to assist the busy clinician who must manage a patient. The diseases overlap with the Blueprint diseases the WHO has designated as needing research and countermeasure development. The intent is to publish the summaries in a journal compendium. At this time, manuscripts on Marburg virus and Crimean Congo hemorrhagic fever virus are near completion and the other five are in various stages of development. The goal is to then add links to the articles on the NETEC website (NETEC.org) and include tables that can be updated as new information comes available.

4. **Sample Repository:** The Biorepository working group recognizes the importance of clinical samples for furthering our knowledge of disease pathogenesis. The working group has identified potential BSL-3 and 4 laboratory collaborators who can store, ship, and conduct assays on samples drawn from patients in the network for research purposes. The working group is developing sample SOPs for processing and storage of the specimens as well as specimen request procedures to ensure a fair and transparent process to share samples for research. In addition, the working group is drafting a white paper for publication to provide feedback to the CDC regarding the challenges of managing, shipping, and storage of clinical specimens from patients infected with select agents.

5. **Knowledge Sharing:** The SPRN members continue to share their expertise with the broader scientific community. Two SPRN-related editorials were published in a January 2019 special Health Security issue focused on biocontainment units. One article summarized the SPRN and the other discussed the challenge of using MCMs when there are no licensed products and no established guidelines available. Two other articles included participation from SPRN members – one on caring for pediatric patients in a biocontainment unit and another that discussed operationalizing a research component into a readiness exercise. In addition, the SPRN has had increased collaboration with the rest of the NETEC activities through addition of research as part of site assessments and addition of a research component in last year's Tranquil Terminus national exercise. SPRN also strives to share knowledge at key national medical conferences. MCM team members submitted a symposium proposal for the 2019 American Society

of Tropical Medicine and Hygiene (ASTMH) meeting in collaboration with SPRN partners on the challenges of using MCMs during an outbreak. An abstract was also submitted on the SPRN MCM initiative to both the Military Health System Research Symposium (MHSRS) and the ASTMH 2019 annual meetings. The MHSRS abstract was accepted for an oral presentation in August 2019.

Training Readiness

SPRN members participated in a training program on conducting research in a biocontainment unit, which was sponsored by the FDA and University of Texas Medical Branch, Galveston and held on the NIH campus in Bethesda, Md. The program was well received and is expected to become a recurring training program. The SPRN has also developed comprehensive online training



including an overview of clinical research procedures, the process of obtaining patient consent, and documentation in clinical research. These tools are soon to be available at NETEC.org.

REFERENCES

Kraft CS, et al. The Special Pathogens Research Network: Enabling Research Readiness. *Health Security.* 2019;17:35-45.

Bhadelia N, et al. Evaluating Promising Investigational Medical Countermeasures: Recommendations in the Absence of Guidelines. *Health Security.* 2019;17:46-53.

Vasa A, Madad S, Larson L, Kraft CS, Vanairsdale S, Grein JD, Garland J, Butterworth VM, KratochvilCJ. A Novel Approach to Infectious Disease Preparedness: Incorporating Investigational Therapeutics and Research Objectives into Full-Scale Exercises. *Health Security.* 2019;17:54-61.

Cieslak T, Evans L, Kortepeter MG, Grindle A, Aigbivbalu L, Boulter K, et al. Perspectives on the management of children in a biocontainment unit: Report of the NETEC Pediatric Workgroup.

Regional Treatment Network for Ebola and Other Special Pathogens [phe.gov] [protect2.fireeye.com] [protect2.fireeye.com] https://www.phe.gov/Preparedness/planning/hpp/reports/Documents/RETN-Ebola-Report-508.pdf

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