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In September 2022, just as the global outbreak of Mpox was waning, the spotlight shifted to Uganda where an outbreak of Sudan ebolavirus disease (SUDV) was reported. While recent outbreaks of Zaire ebolavirus in Guinea and the Democratic Republic of the Congo were controlled through infection prevention and control measures, surveillance, contact tracing, and ring vaccination, there are no approved vaccines or therapeutics to prevent or treat SUDV. Consequently, the potential public health impact of this outbreak in Uganda was high, and the risk of global spread was very real.

NETEC, leveraging the expertise of the Regional Emerging Special Pathogen Treatment Centers (RESPTCs), played a pivotal role in preparing health care workers to respond to SUDV. Collaborative efforts led to the development of essential resources, including medical countermeasure readiness, novel diagnostic capabilities, the Health Care Facility Viral Hemorrhagic Fever (VHF) Preparedness Checklist, town hall sessions, and EMS Biosafety Transport protocols.

During the SUDV outbreak, NETEC facilitated international collaboration, bringing together representatives from 24 biocontainment units across 10 countries, including those with experience caring for patients with Ebolavirus disease (EVD). This sharing of best practices and experiences was instrumental in fortifying domestic and global preparedness for SUDV.

NETEC developed a rapid assessment tool to evaluate hospital and EMS agency readiness to manage SUDV/VHF cases.

A Partnership for Preparedness

The National Emerging Special Pathogens Training and Education Center’s mission is to set the gold standard for special pathogen preparedness and response across health systems in the U.S. with the goals of driving best practices, closing knowledge gaps, and developing innovative resources. Our vision is a sustainable infrastructure and culture of readiness for managing suspected and confirmed special pathogen incidents across the United States public health and health care delivery systems.
Additionally, NETEC conducted onsite readiness assessments in priority jurisdictions adjacent to five international airports in the U.S. in collaboration with the Department of Health and Human Services Administration for Strategic Preparedness and Response (HHS ASPR) and state and jurisdictional health departments.

NETEC rapidly initiated the BioFire® Implementation Task Force to onboard testing capabilities for SUDV and several other high-consequence pathogens at 10 RESPTCs and the National Institutes of Health Clinical Center. This readiness initiative continued to demonstrate value during the Marburg virus disease (MVD) outbreak in early 2023, as the RESPTCs were able to leverage their new testing capacity for this pathogen as well. During each outbreak, NETEC, through the Special Pathogens Research Network (SPRN) and leadership from the Biocontainment Unit (BCU) Workgroup, responded by convening weekly Outbreak Readiness calls with NETEC leadership and the RESPTCs to ensure situational awareness of the latest outbreak updates, coordinate with federal partners, and enable rapid problem-solving among the national group. These weekly calls were an opportunity for RESPTCs to provide real-time reports on their readiness and local issues or readiness gaps, as well as a platform for multi-site problem solving. In addition, NETEC developed the national readiness dashboard, tied to a weekly cadence of operational updates from RESPTC medical directors, and briefings for federal partners to keep abreast of the nation’s readiness and capacity to respond to special pathogen outbreaks.

In addition to operational achievements, NETEC made significant strides in the development, expansion, and maturation of the National Special Pathogen System (NSPS), with support from HHS ASPR and many partner organizations. This year NETEC was appointed by Congress to serve as the NSPS Coordinating Body, leveraging the extensive experience and expertise within NETEC to support services and functions across the System of Care. This strategic move ensures streamlined coordination, effective decision-making, and a cohesive approach to special pathogen care. The addition of three more RESPTCs in FY23 extends the system’s reach and enhances NETEC’s national capacity to respond promptly to emerging threats.

While navigating the complexities of global health challenges, NETEC remains steadfast in its mission to enhance special pathogen preparedness, foster collaboration, and ensure that health care systems worldwide are equipped to respond effectively to emerging threats. This annual report details the FY23 accomplishments, challenges, and ongoing initiatives that position NETEC as a leader in the field of infectious disease preparedness and response.

FIGURE 1
Map of Regional Emerging Special Pathogen Treatment Centers (RESPTCs)

Extending Partnerships, Advancing Preparedness

NETEC’s mission is to set the gold standard for special pathogen preparedness and response across health systems in the U.S. with the goals of driving best practices, closing knowledge gaps, and developing innovative resources. Established in 2015 by HHS ASPR and the Centers for Disease Control and Prevention (CDC) following the successful treatment of patients with Ebola in 2014, NETEC works to build a sustainable infrastructure and robust culture of readiness by leveraging the expertise of regional partners and federal agencies to assess health care facility readiness, train providers, provide technical assistance, and build a rapid research infrastructure. More than 100 industry leaders representing a range of health care specialties, from infectious disease clinicians to emergency medical service leaders and public health officials, share their expertise across NETEC’s 15 national workgroups and nine task forces, producing timely and innovative educational resources, providing technical consulting and assistance, convening global partners, and building a nation-wide special pathogens research infrastructure.

In FY23, recognizing the need to expand the nation’s biocontainment capabilities, HHS ASPR funded three new RESPTCs: the University of North Carolina at Chapel Hill, MedStar Washington Hospital Center with their pediatric partner Childrens National Hospital, and Corewell Health System. NETEC embraced these new partners and played a crucial role in supporting them in their first year. In FY23, NETEC provided technical support, educational resources, and engaged in a series of information exchanges to contribute to the maturation of these programs.
NETEC by the Numbers

Education, Training, and Resource Development

ONLINE LEARNING
11,400 health care workers participated in
64 free, online courses and
9 live special pathogens training webinars
14,787 training person hours

PODCASTS
1,812 listeners downloaded
27 different episodes of NETEC’s podcast, Transmission Interrupted,
3,044 times

VIDEO LIBRARY
3,070 subscribers viewed NETEC’s YouTube channel more than
136,448 times, logging
9,336 hours of on-demand training, skill-building, and e-learning

RESOURCE LIBRARY UTILIZATION
23,135 users from all
50 U.S. States and
153 countries downloaded
9,460 reference guides, frontline checklists, exercise templates, and more

Readiness Consultation and Assessment

EXPERT SPECIAL PATHOGENS READINESS CONSUL TATIONS
100 subject matter experts provided more than
160 hours of readiness consultation and assessment activities across
13 domains of special pathogens preparedness, completing
22 combined in-person, virtual, and hybrid readiness consultations

NATIONAL SPECIAL PATHOGEN OUTBREAK RESPONSE
27 national outbreak readiness calls were held with leaders from
13 Regional Emerging Special Pathogen Treatment Centers (RESPTCs) to address the emergent SUDV, Mpox, and MVD outbreaks

14,787 training person hours

TECHNICAL ASSISTANCE REQUESTS
351 technical assistance requests were received, and answered, from
10 HHS Regions and
3 international sites in two countries

NETEC SPEcialized Workgroups
100+ subject matter experts, clinicians, and public health representatives participated in
15 national NETEC workgroups

GLOBAL LEADERSHIP
31 high-level isolation units (HLIU) from 15 countries took the HLIU survey to identify future networking and collaboration priorities
185 global experts representing over 40 special pathogens programs from 19 different countries participated across four closed-session Global Rounds events
27 countries were represented in a Global Rounds webinar open to the public on H5N1
14 organizations representing six countries participated in an international transportation tabletop exercise

OUTREACH AND COMMUNICATIONS
70,695 users visited the NETEC.org website, resulting in
151,099 pageviews

Coordination, Outreach, and Thought Leadership

RESEARCH CAPABILITY AND CAPACITY BUILDING
10 RESPTCs and the National Institutes of Health Clinical Center (NIH CC) participated in
11 tabletop exercises and two functional shipping exercises to prepare for the implementation of a protocol for Sudan ebolavirus experimental study drug, MBP-134

NETEC by the Numbers FY2023 JULY 1, 2022 — JUNE 30, 2023

NETEC by the Numbers FY2023 JULY 1, 2022 — JUNE 30, 2023
Currently in implementation, the NSPS’s mission is to provide a coordinated and standardized health care network of high-quality, patient- and community-centered care locations in the United States for patients suspected of or known to be infected by a special pathogen, while protecting the community and health care workforce.

In 2022, the U.S. Congress further designated NETEC to serve as the Coordinating Body of the NSPS, responsible for “establishing a robust NSPS and integrating NSPS with other health care delivery systems,” providing $21 million in funding to NETEC and the RESPTCs and increasing the number of designated regional facilities from 10 to 13. The NSPS operating model leverages the significant experience, expertise, and leadership within NETEC to support NSPS functions across the System of Care, a tiered system of health care facilities equipped to provide care for patients infected by, or suspected to be infected by, a special pathogen at increasing levels of specialization and capabilities.

Over the past year, NETEC has made significant progress in advancing the objectives of the NSPS: defining the structure and governance, strengthening the NETEC Coordinating Body as the convener in response, engaging key partners across the health care ecosystem to identify essential capabilities within the System of Care, testing those capabilities through pilot workshops, and further developing the capacity of the network to sustain an infrastructure for coordinated and standardized special pathogen response.

NETEC Takes the Lead as the NSPS Coordinating Body

As the Coordinating Body of the NSPS, NETEC unifies public and private entities in protecting national health security and leading with a commitment to equity, supporting the RESPITCs and other health care entities in providing high-quality, timely patient- and community-centered care by coordinating across the U.S. with health care and public health partners in response and readiness for current or novel special pathogens of concern.

In the past year, NETEC engaged key partners in regional and national leadership to serve on the NSPS Core Advisory Group (CAG) in order to develop alignment around the structure and governance of the NSPS, and to begin the process of prioritizing services and functions. These activities included the execution of a “strategy lab” attended by NETEC Principal Investigators and staff, the development of specific recommendations by the Core Advisory Group, the gathering of targeted input from expert partners in special pathogens and related fields, and the development of a focus group to analyze the recent response to the Mpox outbreak through the lens of the NSPS.

Through these efforts, NETEC finalized the Coordinating Body operating model; developed a plan for engaging System of Care facilities; established targets and a timeline for external partnership development; identified gaps and requirements in special pathogen response data and analytics; and developed preliminary guidance and standards for future evaluation.

Defining Capabilities Within The System Of Care

The System of Care is comprised of four tiers of health care facilities equipped to provide care, at increasing levels of specialization, for a patient with a confirmed or suspected special pathogen infection. In order to further define and operationalize the minimum capabilities of facilities at each level of the System of Care, NETEC convened the System of Care Committee, consisting of experienced leaders from the previous tiered system and hailing from all 10 HHS Regions, to guide the creation of Minimum Viable Capabilities for Levels of the NSPS System of Care. Led by core NETEC subject matter experts Paul Biddinger (R1-Massachusetts General Hospital) and Shelly Schwedhelm (R7-Nebraska Medicine), the System of Care Committee affirmed the hub-and-spoke model of the System of Care.
will operate as hubs within their regions: Level 2, 3, and 4 facilities. NETEC created a strategic NSPS communications plan; developed briefings and trade publications for agencies, frontline health care workers, and beyond. NETEC has leveraged its position as a convener to strengthen buy-in, knowledge of, and commitment to the NSPS strategy. The pilot workshop revealed consensus around NETEC's role as Coordinating Body in supporting national coordination of minimizing financial impact to all tiered facilities. NETEC continues to define, operationalize, and implement the NSPS strategy. In an effort to further define the NETEC Coordinating Body's response posture, and ability to convene, coordinate, and communicate with the System of Care, NETEC launched a pilot workshop to explore, observe, and discuss the role of the Coordinating Body in a special pathogen event. In partnership with HHS Region 10, their partners, and with the inclusion of the Concept of Operations (CONOPS), the pilot workshop explored a scenario designed to identify possible stressors at key “moments that matter” in a special pathogen response. NETEC will collaborate with LEVEL 1 FACILITIES on overall readiness, issues from the field, and national outbreak response.

Enhancing the Depth and Breadth of the NSPS Network

NETEC has prioritized the development and maintenance of NSPS partnerships to strengthen the communication and coordination among RESPTCs, regional readiness systems, and other health care entities that are essential to advancing special pathogen readiness and response capability throughout the country.

TABLE 1
Key NSPS Partners Engaged

| Centers for Disease Control and Prevention (CDC) |
| Healthcare Leadership Council (HLC) |
| Pediatric Pandemic Network (PPN) |
| National Association of County and City Health Officials (NACCHO) |
| Association of Clinical Laboratory Science (ACLS) |
| Association of Public Health Laboratories (APHL) |
| Association for Professionals in Infection Control and Epidemiology (APIC) |
| Laboratory Response Network (LRN) |
| American Hospital Association (AHA) |
| Environmental Protection Agency (EPA) and National Biodefense Preparedness Workgroup |
| American Association of Healthcare Emergency Preparedness Professionals (AHEPP) |
| Task Force for Mass Critical Care (TFMCC) |
| The Joint Commission - New IPC Standards for Frontline Hospitals |

The NSPS Pilot Workshops

An effort to further define the NETEC Coordinating Body’s response posture, and ability to convene, coordinate, and communicate with the System of Care, NETEC launched a pilot workshop to explore, observe, and discuss the role of the Coordinating Body in a special pathogen event. In partnership with HHS Region 10, their partners, and with the inclusion of the Concept of Operations (CONOPS), the pilot workshop explored a scenario designed to identify possible stressors at key “moments that matter” in a special pathogen response. Pilot workshop participants included over 30 representatives from across the R10 states; local, state, and federal government agencies; Level 1, 2, and 3 System of Care facilities; EMS agencies; and NETEC leadership. In the pilot scenario, participants explored regional pain points in the response journey, defined potential roles for NETEC in regional response, documented opportunities to further explore and test the roles identified in the workshop, and provided valuable feedback regarding implementation of the NSPS strategy across the system. The pilot workshop revealed consensus around NETEC’s role as Coordinating Body in supporting national coordination among regions, sharing and providing tools for medical countermeasures and just-in-time resources, and providing guidance and coordinating access to air and ground assets for patient transport.
Assessing Special Pathogen Readiness

NETEC’s innovative Special Pathogen Operational Readiness Self-Assessment (SPORSA) provides hospitals, EMS agencies, and other health care facilities with a free, comprehensive, electronic tool to evaluate their operational readiness for special pathogen preparedness and response. NETEC’s self-assessment tools serve as the foundation for all subject matter expert consultations.

The SPORSA framework covers multiple domains, spanning physical infrastructure, care management, personnel management, and waste management, providing organizations with a comprehensive evaluation of their level of special pathogens operational preparedness.

In FY23, three RESPTCs were enrolled in the annual NETEC readiness consultation. A total of 10 hospitals and seven EMS agencies from all 10 HHS Regions were served through readiness assessment and follow-up consultation by NETEC.

Ready Assessment Domains and Capabilities

NETEC provides individualized self-assessment tools for both hospitals and EMS agencies, focusing on critical areas (domains) that special pathogen preparedness programs should address when preparing for special pathogen response. Within each domain, critical operational elements necessary for preparedness and response are organized into supporting capabilities.

<table>
<thead>
<tr>
<th>Physical Infrastructure</th>
<th>Treatment and Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Facility Clinical Care</td>
<td>• Adult Care</td>
</tr>
<tr>
<td>• Isolation Rooms</td>
<td>• Labor and Delivery Care</td>
</tr>
<tr>
<td>Environment and Infection Control</td>
<td>• Neonatal Care</td>
</tr>
<tr>
<td>• Critical Operating Systems</td>
<td>• Pediatric Care</td>
</tr>
<tr>
<td>• Cleaning and Disinfection</td>
<td>Personnel Management</td>
</tr>
<tr>
<td>Personal Protective Equipment</td>
<td>• Staffing</td>
</tr>
<tr>
<td>• Acquisition and Inventory Management</td>
<td>• Occupational Health</td>
</tr>
<tr>
<td>• PPE Utilization</td>
<td>Laboratory</td>
</tr>
<tr>
<td>• Donning and Doffing Space</td>
<td>• Testing and Biosafety</td>
</tr>
<tr>
<td>• VHF: Trained Observer</td>
<td>Specimen Collection, Handling, Storage, and Transport</td>
</tr>
<tr>
<td>Training and Exercises</td>
<td>Waste Management</td>
</tr>
<tr>
<td>• Orientation and Onboarding</td>
<td>• Identification and Management of Special Pathogen Waste</td>
</tr>
<tr>
<td>• Special Pathogen Response Team Training and Education</td>
<td>Storage of Special Pathogen Waste</td>
</tr>
<tr>
<td>• Just-In-Time Training</td>
<td>Transport of Special Pathogen Waste</td>
</tr>
<tr>
<td>• Exercises</td>
<td>Onsite Inactivation of Category A Infectious Substance</td>
</tr>
<tr>
<td>Emergency Management</td>
<td>Decedent Management</td>
</tr>
<tr>
<td>• Emergency Management</td>
<td>• Internal Processes</td>
</tr>
<tr>
<td>Prehospital</td>
<td>• External Processes</td>
</tr>
<tr>
<td>• Internal Processes</td>
<td>Research</td>
</tr>
<tr>
<td>• External Processes</td>
<td>• Investigational Therapeutics</td>
</tr>
<tr>
<td>Intake and Internal Transport</td>
<td>Waste Management</td>
</tr>
<tr>
<td>• Identify</td>
<td>• Identification and Management of Special Pathogen Waste</td>
</tr>
<tr>
<td>• Isolate</td>
<td>Storage of Special Pathogen Waste</td>
</tr>
<tr>
<td>• Inform</td>
<td>Transport of Special Pathogen Waste</td>
</tr>
<tr>
<td>• Internal Transport</td>
<td>Onsite Inactivation of Category A Infectious Substance</td>
</tr>
</tbody>
</table>

RESPTC Programs: Maintaining Readiness Across the Nation

The RESPTCs serve as designated Level 1 care facilities for patients suspected or confirmed to have a high-consequence infectious disease (HCID). As Level 1 treatment centers, RESPTCs are assessed annually and provide subject matter experts to participate in assessment of peer Level 1 RESPTCs. Over the last two years, RESPTCs have consistently demonstrated high levels of operational maturity and displayed increased performance in preparedness of:

- laboratory capacity
- regional planning and coordination
- training for special pathogen response team members
RESPTC Readiness Assessment: Approach and Results

NETEC conducts annual operational readiness assessments of the Level 1 RESPTCs across the U.S. as part of a two-year cycle of continuous program improvement. In year one, the RESPTC completes the SPORSA and NETEC provides a comprehensive review of all responses as well as a summary report with suggestions to advance program maturity. In year two, NETEC follows up with the RESPTC on the status of recommendations from the previous year, coordinates an onsite program review inclusive of an operations-based exercise, and together NETEC and the RESPTC prioritize recommendations that will carry forward to the next cycle. In FY22, the 10 previously established RESPTCs completed a self-assessment and received follow-up recommendations and support from NETEC subject matter experts around areas identified as opportunities for improvement (Figure 8).

In FY23, Level 1 RESPTC's assessment domains with documented opportunities for advancement were reviewed during follow-up virtual and onsite consultations. Domains with the lowest operational maturity score in FY22 were Environmental Infection Control (78%), Training and Exercise (83%), and Intake and Internal Transport (83%). It should be noted that recommendations for the 10 RESPTCs focused on process optimization as no critical programmatic gaps were identified.

FIGURE 7

NETEC Cycle of Continuous Program Improvement

- Step 1: NETEC invites NETEC to observe an operational exercise and complete an onsite readiness consultation.
- Step 2: The NETEC SME team facilitates a targeted review session at the RESPTC to clarify/confirm program strengths and opportunities.
- Step 3: NETEC provides a report to the RESPTC noting strengths and recommendations for program improvements.
- Step 4: RESPTC invites NETEC to observe a targeted review session to follow up on recommendations from Year 1.
- Step 5: NETEC provides a status report on items from Year 1 based on exercise observations.
- Step 6: The 2023 Readiness Consultation Process: Every two years, the RESPTC engages NETEC operational readiness consultants.
- Step 7: A RESPTC completes the SPORSA in Year 1 of the cycle.

FIGURE 8

FY22 Domains Assessed for Readiness

Aggregate Operational Readiness by Domain

<table>
<thead>
<tr>
<th>Domain</th>
<th>FY22 Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Infrastructure</td>
<td>80%</td>
</tr>
<tr>
<td>Environmental Infection Control</td>
<td>73%</td>
</tr>
<tr>
<td>Personal Protective Equipment</td>
<td>89%</td>
</tr>
<tr>
<td>Training and Exercise</td>
<td>80%</td>
</tr>
<tr>
<td>Emergency Management</td>
<td>82%</td>
</tr>
<tr>
<td>Pre-Hospital</td>
<td>83%</td>
</tr>
<tr>
<td>Intake and Internal Transport</td>
<td>83%</td>
</tr>
<tr>
<td>Treatment and Care</td>
<td>83%</td>
</tr>
<tr>
<td>Personnel Management</td>
<td>88%</td>
</tr>
<tr>
<td>Laboratory</td>
<td>82%</td>
</tr>
<tr>
<td>Waste Management</td>
<td>91%</td>
</tr>
<tr>
<td>Decedent Management</td>
<td>85%</td>
</tr>
<tr>
<td>Research</td>
<td>77%</td>
</tr>
</tbody>
</table>

The RESPTCs engaged with, responded to, and implemented NETEC readiness consultation recommendations at a high rate with over 90 percent of recommendations already implemented or in the process of being implemented.

→ PHYSICAL INFRASTRUCTURE

Following the COVID-19 pandemic, RESPTCs recognized the need to adjust training, unit preparedness, and inventory management due to increased utilization of biocollection unit spaces for routine patient care. RESPTCs were found to have improved communication systems for patient care and staff safety. Future assessments will explore strategies to optimize the utilization and maintenance of special pathogens laboratory spaces.

→ ENVIRONMENTAL INFECTION CONTROL

Environmental infection control recommendations provided to RESPTCs largely addressed opportunities to optimize utilization of zones within the Emergency Department and Biocollection Unit isolation areas to maximize containment and worker safety. RESPTCs noted higher rates of staff turnover with considerations focused on how to improve the performance of new staff. During onsite FY23 consultations it was observed that training to reduce the risk for cross contamination improved operational readiness needed. Strategies to incorporate environmental infection control skills into training were included in follow-up discussions and reports.

→ PERSONAL PROTECTIVE EQUIPMENT (PPE)

RESPTCs were noted to have mature processes established for selection and utilization of PPE. Recommendations focused on refinement of donning and doffing practices and identifying opportunities to implement uniform PPE across groups of staff.

→ TRAINING AND EXERCISE

RESPTC's ability to maintain training throughout the pandemic response was challenging due to staffing shortages, turnover, and limited access to biocollection spaces. NETEC and the RESPTCs implemented creative strategies to overcome these challenges, including the development of extended reality (XR) education, just-in-time (JIT) training materials, and creation of training spaces that simulated the biocollection unit care environment. Recommendations to re-establish regularly scheduled exercises were implemented or noted to be in progress with many RESPTCs conducting no-notice communications drills, mystery patient point of entry exercises, and expansion of skills drills for rested staff. The majority of RESPTCs reported challenges in maintaining training for Emergency Department personnel due to staff turnover and high patient volumes. NETEC workgroups developed just-in-time training and explored successful models for training Emergency Department personnel.

While progress has been demonstrated on improving frequency and attendance at trainings, future consultations will continue to focus on strategies to advance staff preparedness.

→ EMERGENCY MANAGEMENT

The emergency management domain is well established, and plans are mature across the RESPTCs. Internal facility plans to leverage incident command structures have been assessed and refined through exercises and real-world events. Opportunities to update and refine state and regional plans for coordinating special pathogens response efforts were noted by many of the RESPTCs. Collaboration with local, state, and federal public health partners is ongoing to optimize these plans across all HHS regions.

→ PREHOSPITAL

RESPTCs were noted to have long-standing established relationships with primary EMS agencies that would provide special pathogens transport. Recommendations to expand the number of EMS agencies engaged in regional planning and training were implemented in the majority of regions. RESPTC's noted future plans to conduct exercises to test state and regional special pathogen transport plans.

→ INTAKE AND INTERNAL TRANSPORT

The ability to rapidly identify and isolate an individual who may have a high consequence infectious disease at all points of entry is a key component of infectious disease preparedness. The majority of RESPTCs are leveraging electronic health record systems to screen all patients presenting for care. RESPTCs were noted to have opportunities to enhance internal transport procedures including the use of containment devices and simplifying routes from points of entry to the biocollection units. RESPTCs who received these recommendations demonstrated implementation of corrections and improved processes during their onsite readiness consultations.

→ TREATMENT AND CARE

Discussions in FY23 readiness consultations focused on strategies to enhance care delivery and provide advanced levels of care and interventions safely, including neurological monitoring and imaging, maternal/fetal care during emergent labor scenarios and pediatric critical care interventions. Recommendations most frequently noted recruitment of specialty care team members and creating plans to provide conventional standards of care to patients admitted to their biocollection units.

→ PERSONNEL MANAGEMENT

Staffing shortages and turnover rates represent the most common and prominent challenge to special pathogens readiness amongst the RESPTCs, impacting several domains and capabilities. Strategies to optimize staffing plans to address staff shortage, turnover, stress, and exhaustion are in progress across all RESPTCs.
NETEC implemented the RESPTC Operational Readiness Scorecard in August 2022. The scorecard was developed by a NETEC-led task force comprised of RESPTC program leaders. It includes critical readiness factors across a subset of SPORSA domains designed to capture data to inform HHS ASPR’s patient placement decisions. The RESPTCs submit separate scorecards detailing their status to activate for both adult and pediatric patients. Responses to each item are categorized as “Ready: all factors associated with the item can be completed in eight hours or less;” “Ready with Conditions: all factors associated with the item cannot be completed in eight hours but can be achieved in 12 hours;” or “Not Ready: all factors associated with the item will take longer than 12 hours to be complete.”

The RESPTCs submit scorecards to NETEC monthly using an automated data capture process. Additionally, RESPTCs may submit an on-demand scorecard to capture any critical readiness changes during the month. Responses are reviewed and analyzed by NETEC leadership and aggregated into dashboards within a secure system.

### PERSONNEL MANAGEMENT

The ability to maintain adequate staffing for both adult and pediatric admissions varied throughout the year. Most fluctuations were seen within the critical care capabilities for pediatric admissions.

- Over the 12 months, 60 percent of RESPTCs reported “Ready” conditions for pediatric staffing with critical care nurses, and 80 percent of RESPTCs reported “Ready” conditions for critical care physicians.
- Over the 12 months, 80 percent or more of the RESPTCs reported “Ready” for adult staffing with critical care nurses, and 100 percent of RESPTCs reported “Ready” for critical care physicians.

For the majority of the year, the RESPTCs maintained their capacity to provide care for one adult or one pediatric patient. Conditions reported by RESPTCs noted that the age and acuity of the patient would determine the number of admissions that could be safely cared for in their facilities.

### PHYSICAL INFRASTRUCTURE

Over a 12-month period, the 10 established RESPTCs reported on accessibility and availability of their designated biocontainment units to activate for patient admissions.

- Ten out of 12 months, all 10 RESPTCs reported being able to admit one pediatric patient and one adult patient to their biocontainment unit in 12 hours or less.
- All RESPTCs reported that their designated laboratory space for supporting special pathogen clinical tests were set up and able to be utilized within eight hours across the 12-month period.

### WASTE MANAGEMENT

All RESPTCs reported having a waste management plan in place to manage Category A hazardous substances over the 12 months; either through onsite inactivation using steam sterilization or through an approved vendor to package and transport the waste for final disposition.

### LABORATORY MANAGEMENT

Table 3: Operational Readiness Scorecard: Critical Care Interventions

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Adults</th>
<th>% RESPTCs Reporting “Yes”</th>
<th>Pediatrics</th>
<th>% RESPTCs Reporting “Yes”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>VHF</td>
<td>novel respiratory pathogens</td>
<td>VHF</td>
</tr>
<tr>
<td>Mechanical ventilation</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Renal replacement therapy</td>
<td>100%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Invasive hemodynamic monitoring</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Central venous access</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Radiological imaging</td>
<td>95%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Obstetric procedures</td>
<td>100%</td>
<td>80%</td>
<td>95%</td>
<td>90%</td>
</tr>
<tr>
<td>ECMO</td>
<td>40%</td>
<td>80%</td>
<td>65%</td>
<td>60%</td>
</tr>
<tr>
<td>Major surgical procedures (In situ BCU)</td>
<td>90%</td>
<td>100%</td>
<td>90%</td>
<td>100%</td>
</tr>
<tr>
<td>Major surgical procedures (Operating suite)</td>
<td>20%</td>
<td>70%</td>
<td>10%</td>
<td>70%</td>
</tr>
<tr>
<td>Bronchoscopy</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Neurodiagnostics (EEG)</td>
<td>80%</td>
<td>90%</td>
<td>70%</td>
<td>90%</td>
</tr>
<tr>
<td>Invasive neuro monitoring (e.g., ICP)</td>
<td>40%</td>
<td>90%</td>
<td>40%</td>
<td>90%</td>
</tr>
</tbody>
</table>

Data on this page represents the original 10 RESPTCs and does not include the 3 RESPTCs established in FY23.

*ECMO availability dependent on the age of the patient and staffing capacity.

### TREATMENT AND CARE

RESPTCs reported on their current capabilities to provide critical care interventions. Interventions were specified by pathogen type and patient population. RESPTCs were noted to have the highest degree of variability for interventions available for both adult and pediatric VHF patients; specifically related to surgical interventions, extracorporeal membrane oxygenation (ECMO), and advanced neurological monitoring.
Assessing the Status of Level 2 Facilities: Special Pathogen Treatment Centers

To verify and assess the status of Level 2 Special Pathogen Treatment Centers (SPTCs) to provide care for patients suspected or confirmed to have viral hemorrhagic fevers (VHF), NETEC developed an electronic survey addressing organizational capacity and capabilities to manage VHF cases including: Treatment and Care, Intake and Internal Transport, Laboratory, Waste Management, Physical Infrastructure, Personal Protective Equipment, Personnel, and Training and Education.

Survey Results

In May 2023, 74 facilities were identified as eligible to receive the survey across the 10 HHS regions. NETEC disseminated the survey in June 2023 and received responses from 41 individual facilities with representation from all 10 HHS regions. Of those facilities that responded, the majority reported that capabilities for VHF patient care delivery had been maintained since initial designation, even with disruption to dedicated federal funding. The primary operational barriers to maintaining VHF preparedness for those facilities that reported decommissioning their special pathogen programs were funding constraints, the ability to maintain an adequate number of personnel with a proficient level of training, and a lack of support from the unit’s institution, state, or local government.

Maintaining Preparedness for VHF

Of the 41 Level 2 facilities that responded to the survey, 88 percent (36) indicated that they currently maintain capabilities to care for VHF patients as a treatment center, including the necessary physical infrastructure, standard operating procedures, and adequate numbers of personnel. Of those facilities that currently maintain VHF patient care capacity, 89 percent (32) reported that their organizations continuously maintained their treatment center capabilities since the time of their original designation as an SPTC.

Results by Domain

Treatment and Care

Of the 36 facilities that reported that they have maintained capabilities for VHF patient care 29 provided further responses:

- 76 percent (22) of facilities are prepared to care for adult patient(s) with confirmed or suspected VHF. Four units are not prepared for adult patients, and three units are unsure on their specific level of preparedness for adult patients.
- 52 percent (15) of facilities are prepared to care for pediatric patient(s) with confirmed or suspected VHF. Eight units are not prepared for pediatric patients, and six facilities do not specify if they are capable of caring for pediatric patients.
- All 29 of the responding facilities (100%) reported being prepared to care for a patient with suspected VHF for at least 72 hours.

Intake and Internal Transport

Only one institution of the 29 who responded reported not asking symptom and travel history questionnaires during active infectious disease outbreaks (or otherwise). All 29 responding institutions reported that staff were trained on screening procedures (including steps to take if a patient screens positive), along with a dedicated patient care space for rapid isolation and care of patients with suspected or confirmed VHF. Of the 29 responders, 86 percent (25) specified that they have an adequate number of trained health care professionals to immediately isolate and care for patients with suspected or confirmed VHF. Seventeen of the 29 (59%) who responded to the survey have tested plans to alert and inform internal and external personnel of a patient with suspected or confirmed VHF in the last 12 months.

Laboratory

Of respondents with VHF treatment center capabilities, 100 percent (29) have the equipment and staff necessary for performing clinical laboratory tests. However, only 11 of these facilities have staff who have completed training in phlebotomy procedures in the last six months.

Waste Management

Of facilities that currently have VHF treatment center capabilities, 100 percent (29) have a plan for VHF-related Category A waste management, and 90 percent (26) reported having a current agreement with a vendor licensed to transport Category A infectious substances.

Opportunities for Progress and Future Direction

Respondents were asked to identify domains where their organization would benefit from targeted assistance to maintain or advance readiness for special pathogen events. Of those facilities that responded the majority noted at least two unique domains with some facilities identifying up to 13 areas of need. The most cited domains were:

- Personal Protective Equipment
- Training and Exercise
- Personnel Management
- Physical Infrastructure

Simulation events contribute to the evaluation and improvement of systems, protocols, and partnerships critical for achieving a unified and well-coordinated response to special pathogen events.

Upon closure of this survey NETEC, in collaboration with the RESPTCs, followed up with each participating site to offer individualized targeted support and consultation. As a result, follow up engagements with three sites were scheduled and work is ongoing to establish stronger relationships and coordinate additional support services. As the development of NSPS continues, this cohort of facilities will play a critical role in establishing the designated facilities for Level 2.
Emergency Medical Services: Advancing Readiness for Transportation and Management of Special Pathogens

The NETEC EMS workgroup developed and deployed operational readiness assessment tools, education and training, resources for the EMS community, and real-time technical consultation to support the further evolution of teams that support local, regional, and national patient transportation and management plans. Leveraging these activities, NETEC has begun to identify the strengths and opportunities for advancement in the EMS community. This data is being used to better define the role of EMS partners and inform priorities and strategies to support the development and implementation of the NSPS.

EMS Readiness Assessments

The EMS SPORSA is a comprehensive electronic tool that covers 11 domains and 52 capabilities. It is designed to provide EMS agencies with a better understanding of their agency’s preparedness to provide transportation services for patients suspected or confirmed to have a special pathogen. This tool was developed through the NETEC EMS workgroup leveraging 11 EMS subject matter experts and NETEC staff from HHS Regions 1, 2, 3, 4, and 7. Subject matter experts from all 10 HHS regions and the Biosafety Transport Consortium were given an opportunity to provide feedback on the tool.

In connection with the completion of the SPORSA, EMS agencies are able to receive individualized support from NETEC to validate their self-reported strengths and provide expert guidance on areas with operational gaps. NETEC provided follow-up targeted support, consultation, and education for nine unique agencies and delivered Biosafety Transport Operator courses in three HHS regions.

TABLE 4
EMS SPORSA Domains

<table>
<thead>
<tr>
<th>Education, Training, and Exercises</th>
<th>• Initial Education and Competency Assessment</th>
<th>• Recurrent Education and Competency Assessment</th>
<th>• Agency-Wide Hazard Recognition Education (Identify, Isolate, Inform)</th>
<th>• Just-In-Time Training</th>
<th>• Exercises and Drills</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUI and Confirmed Case Management</td>
<td>• Identify Capability</td>
<td>• Isolate Capability</td>
<td>• Inform Capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications and Coordination</td>
<td>• Hospital</td>
<td>• Transport Team</td>
<td>• Patient</td>
<td>• Partner Agencies (public health, emergency management, law enforcement, airport/fixed based operator)</td>
<td>• Media Relations</td>
</tr>
</tbody>
</table>

Special pathogen exercises are an effective method of teaching and reinforcing best practices in screening, isolation, and infection control in EMS settings.

TABLE 4
EMS SPORSA Domains cont.

<table>
<thead>
<tr>
<th>Infection Prevention and Control</th>
<th>• Ambulance</th>
<th>• Durable Equipment</th>
<th>• Personal Protective Equipment</th>
<th>• PPE Donning and Doffing</th>
<th>• Portable Patient Isolation Unit</th>
<th>• Waste Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital/Clinic Interface</td>
<td>• Patient Preparation</td>
<td>• Patient Hand-Off</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment and Care</td>
<td>• Clinical Care Guidelines</td>
<td>• Charting</td>
<td>• Medical Control/Medical Oversight</td>
<td>• Quality Improvement</td>
<td>• Patient Deterioration/Death</td>
<td></td>
</tr>
<tr>
<td>Personnel Management</td>
<td>• Team Configuration</td>
<td>• Fitness for Duty</td>
<td>• Occupational Health</td>
<td>• Employee Assistance Program</td>
<td>• Post-Mission Medical Surveillance</td>
<td>• Post-Mission After-Action Review</td>
</tr>
</tbody>
</table>

TABLE 5
EMS SPORSA and TSS by Region

<table>
<thead>
<tr>
<th>Region</th>
<th># SPORSAs</th>
<th># TSS</th>
<th>Case Type/Sub-type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1 - in person staff training, 1 - ask an expert - Isopod</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2 - in person staff training</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>4</td>
<td>1 - in person staff training, 2 - ask an expert - Transport and Seatbelt, 1 - speaker request</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1 - ask an expert - Mpox</td>
</tr>
</tbody>
</table>

EMS CONSULTATION AND TARGETED SUPPORT SERVICES

<table>
<thead>
<tr>
<th>Patient Movement</th>
<th>• Destination Guidelines</th>
<th>• Fleet/Vehicle Resources</th>
<th>• Long Distance Ground</th>
<th>• Air Ambulance Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Operating Procedures</td>
<td>• Biohazard Spill</td>
<td>• PPE Breach</td>
<td>• Provider Down</td>
<td>• Vehicle Failure</td>
</tr>
<tr>
<td>Special Considerations</td>
<td>• Pediatric Transport</td>
<td>• Neonate Transport</td>
<td>• Special Needs Patient Transport</td>
<td>• Interstate Transport</td>
</tr>
<tr>
<td>Pandemic</td>
<td>• Supply Chain Integrity</td>
<td>• Workforce Integrity</td>
<td>• Crisis Standards of Care</td>
<td>• Modified Operations</td>
</tr>
</tbody>
</table>
Advancing the Breadth and Depth of National Special Pathogens Preparedness Through Targeted Support Services (TSS)

NETEC provides individualized technical support to hospitals, public health, partners, and EMS agencies that are interested in establishing or advancing special pathogen preparedness. These services provide on-demand access to subject matter experts that can address all domains of readiness for special pathogen response. Service types can include simple requests such as protocol or document review as well as complex support including exercise development and evaluation, training resources, and review of inter-regional coordination and planning efforts.

In FY23, NETEC provided TSS services to every HHS Region and delivered support in every state except New Mexico and Vermont. Additionally, in support of NETEC’s international partnerships and programs, NETEC provided services to partners from Japan, Australia, and Canada.

Ask Our Experts
NETEC received 67 cases through the Ask Our Experts portal and categorized them according to type of request and topics of interest. These requests were triaged across NETEC workgroups for response. Most of the cases were requests for expert guidance addressing specific pathogens of concern, namely Ebola and Mpox (52%), and were further categorized into subtypes including PPE selection and utilization (36%), development and review of policies and procedures (24%), waste management and infection control practices (16%), and laboratory management (12%).

Consultative Services
NETEC received 46 requests for consultation and expert guidance. These requests were all reviewed by a team of coordinators and triaged across NETEC workgroups for response. Requests were diverse in nature and included onsite or virtual consultation for special pathogen program review (57%), delivery of staff training and education (33%), EMS and transport protocols (17%), and services related to exercise development and evaluation (11%).

Long-Term Care Workbook Requests
In FY22, NETEC published the Long-Term Care Special Pathogens Preparedness Workbook, and in FY23 the workbook continued to be a sought-after resource. Public health departments, long-term care administrators, and government agencies, among others, requested the workbook 165 times. Requests came in from all 10 HHS Regions and the greatest number of downloads were in regions 5, 7, and 10.

RESPTCs Regional Outreach Activities
In addition to supporting requests from NETEC to provide technical assistance, outreach, and education across the U.S., the majority of RESPTC’s reported activities independent of their work with NETEC in 27 states plus the District of Columbia. Of the RESPTCs that provided data to NETEC, the service most often provided was directed outreach to raise awareness of NSPS and the role of the RESPTC for public health departments, hospitals, and health care coalitions, followed closely by consultation, education, and training for health care personnel in hospitals and EMS agencies.

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NETEC leveraged the substantial expertise and shared experiences of special pathogens and infectious disease clinicians among the RESPSCs, within the NETEC workgroups, and among partners across the spectrum of health care provision to create a range of critical resources for clinicians, coordinate national readiness calls, provide critical information regarding the state of special pathogens readiness to national policymakers, and respond to request for support in response to the outbreaks of Mpox, Marburg virus disease (MVD), and Sudan Ebolavirus disease (SUDV).

**JULY 2022:** After being detected in May 2022, U.S. Mpox cases increased rapidly. By mid-July, the CDC reported more than 11,000 cases of Mpox globally, including more than 2,000 confirmed Mpox cases in the U.S. Between July and August 2022, NETEC responded to more than a dozen requests for consultation and support on Mpox topics, including waste management and advice for EMS agencies.

**AUGUST 2022:** Mpox cases peaked in the U.S. between July and August 2022. NETEC implemented a scorecard to verify operational readiness at the RESPSCs across key domains.

**SEPTEMBER 2022:** The Ugandan Ministry of Health confirmed an outbreak of SUDV in Mubende District, in western Uganda, and the recordings were viewed nearly 13,000 times on YouTube.

**SEPTEMBER 2022:** NETEC developed a town hall-style webinar to discuss the current landscape of the SUDV outbreak, IPC and PPE considerations, Joint External Review discussions, and experiences caring for patients with EVD. A total of 605 people registered for the webinar, and 444 people attended.

**SEPTEMBER 2022:** A NETEC podcast episode was published on the basics of viral hemorrhagic fevers and personal protective equipment (PPE). The episode was downloaded 335 times.

**DECEMBER 2022:** NETEC developed a stoplight dashboard to share critical information regarding the state of special pathogens readiness at the RESPSCs with national policymakers.

**AUGUST 2023:** The World Health Organization (WHO) declared the end of the MVD outbreak, with eight confirmed cases in Tanzania declared the end of the MVD outbreak.

**JULY 2023:** The Ministry of Health of the United Republic of Tanzania declared the end of the MVD outbreak, with eight confirmed cases (and 1 probable) and 65 confirmed deaths.

**APRIL 2023:** The WHO declared the end of the MVD outbreak in Equatorial Guinea.

**JANUARY 2023:** Uganda’s Ministry of Health declared the end of the SUDV outbreak, with 142 confirmed cases (and 2 probable) and 55 confirmed deaths.

**MARCH 2023:** The WHO declared the end of the Mpox outbreak.

**APRIL 2023:** NETEC released a Situation Report on the Mpox outbreak.

**APRIL 2023:** NETEC developed a checklist for facilities to assess their readiness to identify, isolate, provide, and inform, and initial treatment for patients suspected or confirmed to have a viral hemorrhagic fever (VHF). The Health Care Facility VHF Preparedness Checklist was downloaded 1,278 times.

**SEPTEMBER 2022:** NETEC released a Situation Report on the Mpox outbreak.

**SEPTEMBER 2022:** NETEC released a Situation Report on the SUDV outbreak.

**SEPTEMBER 2022:** The CDC issued a Health Advisory recommending that public health departments and health care workers in the U.S. be alert for patients who present with symptoms consistent with EVD and have been in affected areas of Uganda. NETEC released a Situation Report on the SUDV outbreak.

**SEPTEMBER 2022:** NETEC subject matter experts produce a series of blog posts to educate health care personnel about SUDV.

**NOVEMBER 2022:** NETEC released a Situation Report on the SUDV outbreak.

**DECEMBER 2022:** NETEC developed a stoplight dashboard to share critical information regarding the state of special pathogens readiness at the RESPSCs with national policymakers.

**APRIL 2023:** NETEC released a Situation Report on the Mpox outbreak.

**NOVEMBER 2022:** NETEC released a Situation Report on the Mpox outbreak.

**DECEMBER 2022:** NETEC released a Situation Report on the MVD outbreak.

**JUNE 2023:** The Ministry of Health of the United Republic of Tanzania declared the end of the MVD outbreak.

**MARCH 2023:** The WHO declared the end of the MVD outbreak.

**MARCH 2023:** SPHN began conducting a series of tabletop and shipping exercises to prepare for the implementation of a protocol for Sudan ebolavirus experimental monoclonal antibody cocktail, HMB-134.

**MARCH 2023:** NETEC subject matter experts produce a series of blog posts to educate health care personnel about MVD. Blog posts about MVD have been viewed more than 1,350 times.

**MARCH 2023:** The WHO upgraded the public health risk posed by the MVD outbreak in Equatorial Guinea to very high at the national level.

**MARCH 2023:** NETEC released a Situation Report on the MVD outbreak.

**FEBRUARY 2023:** The WHO declined the end of the MVD outbreak in Equatorial Guinea. There were 17 confirmed cases, including 11 reported deaths, 29 probable cases were reported, all of whom died.

**JUNE 2023:** NETEC released a Situation Report on the Mpox outbreak.
Since its inception, NETEC’s innovative training, education, and resources have aided more than 40,000 health care workers in enhancing special pathogens preparedness, individually and within their health care agencies, across the nation, and around the world.

Online and Digital Learning

NETEC continued to produce and share educational content across a wide range of digital platforms, strategically aligning with the accessibility preferences of health care workers. In FY23, NETEC added seven new courses to its online Learning Management System (LMS). Of these new courses, an innovative and curated Infection Prevention and Control Learning Journey, an updated Biosafety Transport for Operators course, and a course dedicated to HCS for Special Pathogens Preparedness were launched, bringing the total number of online courses to 64. The Infection Prevention and Control Learning Journey course had 870 enrollees in FY23. The refreshed Biosafety Transport for Operators course, in addition to providing education for EMS personnel about pathogens of concern and operational considerations for patient transport and management, also facilitates a hybrid delivery of this 8-hour course, combining online education with in-person hands-on instruction. In total, online learners earned 1,412 continuing education credits for courses added in FY23.

In addition to new online courses, NETEC hosted webinars and training videos on NETEC’s YouTube channel; provided specialized educational content on NETEC’s website and blog; and produced two ongoing informational series: NETEC Situation Reports, which provide up-to-date information on special pathogens outbreaks from NETEC subject matter experts, and Transmission Interrupted, the first podcast series of its kind to feature special pathogens-focused content.

Of note, FY23 webinar attendance increased by 257 percent, from 1,925 to 4,575, while online learners earned 1,412 continuing education credits for courses added in FY23.

In FY23, NETEC accelerated the development of outbreak-specific educational resources to address the urgent and ongoing needs of health care personnel during the SUDV, Mpox, and MVD outbreaks to include an Ebola town hall-style webinar, skills videos for Mpox, and more.

In FY23, NETEC continued to expand its digital educational offerings to meet the evolving needs of the special pathogens health care workforce, leveraged partnerships with professional organizations to provide in-service education at professional conference exhibit booths, and provided support to the RESPTCs in their regional educational outreach initiatives. The 13 RESPTCs are vital contributors to NETEC’s success, providing subject matter expertise that is the foundation of NETEC’s education, training, and resources.

NETEC provides special pathogens preparedness and response education through in-depth online courses, live and recorded webinars, podcasts, skills and micro e-learning videos, and a broad range of on-demand, downloadable resources. More than 11,400 individual health care workers logged more than 14,787 training person hours by utilizing NETEC’s library of free online courses (most available for continuing education credits), training webinars, skill-building video, educational and informational podcasts.

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and in the facilities where they work. Users from all 50 states in the U.S. and 153 nations downloaded more than 9,400 resources from the NETEC Resource Library in FY23. This represents a more than 300 percent increase in Resource Library utilization between FY22 and FY23, led in part by increased demand for guidance related to the Mpox, MVD, and SUDV outbreaks around the world. Early in the SUDV outbreak, NETEC subject matter experts took proactive steps to prepare health care workers by developing the Health Care Facility Viral Hemorrhagic Fever (VHF) Preparedness Checklist. This resource alone garnered over 1,700 downloads, reflecting its immediate relevance and impact. Combined, these resources provided a variety of accessible self-paced learning opportunities for health care workers on topics ranging from fundamental infection prevention and control practices, to specialized skill development like special pathogens and ensuring a comprehensive, national awareness of NETEC’s special pathogens preparedness training and resources. NETEC’s special pathogens preparedness training and resources. NETEC’s in-service education showcased practical tools, awareness of NETEC’s special pathogens preparedness training and resources. NETEC’s in-service education showcased practical tools, including in-service education for EMS at the Journal of Emergency Medical Services (JEMS) and 13 presentations at the National Association of County and City Health Officials (NACCHO) Preparedness Summit. NETEC’s presence at these professional conferences is vital in fostering collaboration and strengthening a network of health care professionals and organizations from different regions further promotes partnerships, creating a robust network dedicated to collectively addressing the challenges posed by special pathogens and ensuring a comprehensive, nation-wide approach to preparedness.

**RESPTC Outreach & Conference Highlights**

NETEC participated in several national conferences and provided in-service education at exhibit booths, providing outreach and awareness of NETEC’s special pathogens preparedness training and resources. NETEC’s in-service education showcased practical tools, newly developed educational materials, and hands-on demonstrations, offering tangible solutions to the challenges faced by health care workers. NETEC subject matter experts provided tailored education and resources for unique audiences, including in-service education for EMS at the Journal of Emergency Medical Services (JEMS)/EMS Today Fire Department Instructors Conference, and 13 presentations at the National Association of County and City Health Officials (NACCHO) Preparedness Summit. NETEC’s presence at these professional conferences is vital in fostering collaboration and strengthening a network of health care workers dedicated to enhancing special pathogens preparedness. The exchange of information at these events empowers attendees with the latest developments in the field and positions NETEC as a thought leader, reinforcing its commitment to advancing the knowledge base within the health care community. NETEC, in collaboration with RESPTCs, fulfilled several requests for expert speakers this year spanning both in-person and virtual formats from regions across the United States. By fulfilling these requests, NETEC played a pivotal role in disseminating crucial information and best practices on special pathogen preparedness. NETEC’s subject matter experts supported speaker requests by meeting with requestors, assessing knowledge gaps, and tailoring educational content and resources for targeted audiences. Providing support for speaker requests reinforces NETEC’s outreach efforts by extending valuable resources to a broad and geographically dispersed audience. Moreover, the collaboration with health care professionals and organizations from different regions further promotes partnerships, creating a robust network dedicated to collectively addressing the challenges posed by special pathogens and ensuring a comprehensive, nation-wide approach to preparedness.

**TABLE 6**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Unique Downloads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care Facility Viral Hemorrhagic Fever (VHF) Preparedness Checklist</td>
<td>1,728</td>
</tr>
<tr>
<td>NETEC Town Hall: Preparing Frontline Health Care Workers for Ebola</td>
<td>394</td>
</tr>
<tr>
<td>Viral Hemorrhagic Fevers (VHF)s Matrix</td>
<td>223</td>
</tr>
<tr>
<td>Viral Hemorrhagic Fever (VHF) or Orthopox Virus — Emergency Department Screening Protocol</td>
<td>150</td>
</tr>
<tr>
<td>Space Recommendations for Donning and Doffing Personal Protective Equipment (PPE) in Biocontainment Areas</td>
<td>113</td>
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*“Having a variety of subject matter experts from across the country that could share local anecdotes as best practices [was the most beneficial aspect of the webinar]. I appreciated that all presenters were clinicians and able to speak to the concerns of HCWs from a shared ‘boots on the ground’ experience.” — Webinar attendee*
Research Capability and Capacity

Regulatory Infrastructure
Over the past year, the Special Pathogens Research Network (SPRN) made headway in enhancing regulatory infrastructure for special pathogens research. Typically, establishing human subjects research protocols is a lengthy approval process with many regulatory steps to review; however, during a special pathogens outbreak, the luxury of time is not available. Facilitating regulatory preparedness is a top priority to ensure human subjects research readiness should a patient need experimental therapeutics. SPRN conducted a series of tabletop and shipping exercises to improve research preparedness across the network leveraging the real-world implementation of a protocol for the investigational product MBP-134 (Mapp Biopharmaceutical). These exercises carried participants through the administrative and logistical processes needed to successfully onboard the protocol and ensure receipt of the study drug. Lessons learned from these exercises were taken into account in the beginning phases of the protocol submission to NETEC’s central Institutional Review Board (IRB) and through each site’s local IRBs.

Laboratory And Bench Research Capacity Building
This year, the SPRN protocol "Advancing Vaccine Research for High-Consequence Infectious Diseases" was submitted for approval using NETEC’s central IRB. The protocol will collect biological specimens and clinical data from individuals offered a vaccine against a high-consequence pathogen (e.g., Ebola, smallpox/Mpox, anthrax). Once approved, it is intended that the protocol may be onboarded by all 13 RESPTCs. The first specimens will be from those eligible to receive the ERVEBO® (Merck & Co., Inc., Ridgeway, NJ) vaccine, developed to protect against Zaire ebolavirus.

The SPRN protocol: “Advancing Vaccine Research for High-Consequence Infectious Diseases” will collect biological specimens and clinical data from individuals offered a vaccine against a high-consequence pathogen, contributing to the development of a biorepository and enhancing SPRN’s laboratory and bench research capacity.

Guidelines for Clinical Management of Special Pathogens and Use of Medical Countermeasures
In FY24, SPRN members will continue working on guidelines for clinical management of special pathogens and the use of medical countermeasures on the following topics:
- Smallpox: A Summary for Clinicians
- Nipah Virus: A Summary for Clinicians
- Crimean-Congo Hemorrhagic Fever: A Summary for Clinicians

SPRN in Response and Federal Level Support
Several special pathogens outbreaks occurred in FY23. The ongoing Mpox outbreak began to slow down, but Sudan ebolavirus, Marburg virus, highly pathogenic avian influenza, and other threats continue to keep SPRN on high alert.

Weekly Outbreak Readiness calls, led by SPRN and the BCU workgroup, were created and organized specifically to facilitate situational awareness by providing outbreak updates, an interface with federal partners, and a platform to ask questions and solve problems among colleagues.

A task force led by SPRN leadership was created to implement pathogen identification and diagnostic capabilities for pathogens such as Sudan ebolavirus, Marburg virus, and more at each of the RESPTCs. Through navigating complex regulatory pathways and administrative requirements, ultimately all RESPTCs onboarded the diagnostic tool. As the Sudan ebolavirus outbreak ended, a new Marburg virus outbreak began, proving the implementation of such a specific diagnostic tool a valuable effort, as each RESPTC was subsequently also prepared to test for Marburg virus.

The large number of outbreaks that occurred in this past year also identified the need to establish a weekly touchpoint with RESPTC leadership to discuss their readiness status with federal partners. The data, presented in the form of a stoplight dashboard, was shared weekly with HHS ASPR colleagues, and used to inform federal interagency partners including the National Security Council.

This protocol will contribute to the development of a biorepository and help enhance SPRN’s laboratory and bench research capacity. The biorepository utilizes OpenSpecimen (Krishagni Solutions Pvt Ltd, St Louis) for specimen management and distribution. This year, SPRN conducted a successful virtual shipping exercise in which specimens were electronically “shipped” between RESPTCs. The SPRN workgroup, State of the Science for Basic & Translational Research, will provide biorepository oversight and serve as the committee for all specimen and data requests. In addition, SPRN surveyed shipping capacity across RESPTCs. Survey results indicated that all sites are prepared to ship specimens including exempt human specimens, Category B, and Category A.

Research for High-Consequence Infectious Diseases will collect biological specimens and clinical data from individuals offered a vaccine against a high-consequence pathogen (e.g., Ebola, smallpox/Mpox, anthrax). Once approved, it is intended that the protocol may be onboarded by all 13 RESPTCs. The first specimens will be from those eligible to receive the ERVEBO® (Merck & Co., Inc., Ridgeway, NJ) vaccine, developed to protect against Zaire ebolavirus.
Global Relationship Building for Special Pathogen Preparedness

NETEC’s International Partnerships and Programs (IPP) was established in FY22 to strengthen relationships with and learn from international partners working in special pathogens. Recognizing a niche space to be filled, IPP has focused on increasing networking of global high-level isolation units (HLIUs), i.e., facilities with similar capabilities and mandates as U.S. RESP Tec Centers. In FY22, NETEC began by engaging with high-level isolation units (HLIUs), i.e., facilities focused on increasing networking of global high-level isolation units (HLIUs), i.e., facilities that are primarily equipped for high biocontainment demand. Recognizing a niche space to be filled, IPP has focused on increasing networking of global high-level isolation units (HLIUs), i.e., facilities with similar capabilities and mandates as U.S. RESP Tec Centers. In FY22, NETEC began by engaging with high-level isolation units (HLIUs), i.e., facilities focused on increasing networking of global high-level isolation units (HLIUs), i.e., facilities that are primarily equipped for high biocontainment demand.

Global Rounds
Global Rounds are an opportunity for international HLIUs to virtually network, learn from each other’s experiences, and discuss important topics unique to HLIUs. During FY23, they also served as a forum to share information about ongoing outbreaks, including during the Mopox and SUDV outbreaks. IPP hosted its first Global Rounds in FY22 with participants representing three countries (the United States, the United Kingdom, and Germany). In FY23, IPP held four closed-session Global Rounds that engaged 185 global experts representing over 40 special pathogens programs from 19 different countries. Additionally, in June 2023, IPP partnered with NETEC Education and Training to provide a webinar on Highly Pathogenic Avian Influenza (H9N1). Invitations for this Global Rounds were widely disseminated domestically and internationally, including by colleagues from the Pan American Health Organization (PAHO) to their networks. Participants represented organizations from 16 countries in the region. IPP looks forward to building a relationship with PAHO in FY23 to further partnerships in this region.

International HLIU Survey Results
NETEC’s IPP was established to build relationships with global special pathogens programs. To better understand global HLIUs’ characteristics, existing partnerships, best practices, and challenges, as well as to gauge HLIUs’ interests in increased collaboration and networking of HLIs, IPP workgroup members drafted a global HLIU survey in Fall 2022. The survey was disseminated to 36 HLIUs; 31 units responded. These 31 units represented organizations in North America (11), Europe (16), Asia (3), and Australia (1), some of which NETEC had prior engagement with and others that were new relationships at the time.

Results of the survey demonstrated similarities and differences among global units. For example, all but one of the HLIs established before 2020 played a role during the early days of the COVID-19 pandemic, including advising national governments, providing training at the local or national level, and participating in research. Additionally, while most units reported requirements for designation, those decrees came from many different, and often multiple, sources, with 74% requiring designation from the federal government, 58% from local government, and 39% from local health departments.

Following survey analysis, participating HLIUs were invited to a virtual session to discuss survey results. Six priorities for future networking and collaboration were identified in survey results: staffing, training, research, international coordination, domestic outreach and coordination, and readjustments to metrics. The results from the International HLIU survey were used as a foundation for future IPP activities to ensure activities meet the needs of the global high-level isolation community. All 31 units said they were interested in further collaboration, with the highest levels of interest indicated for in-person networking meetings and partnering on educational training. Participating units were asked to identify areas of best practices and challenges. Best practices were identified in order to identify peers that may have the knowledge and expertise.

IPP Global Rounds Topics, Dates, and Formats

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mopox</td>
<td>September 2022</td>
<td>Presentations and Q&amp;A</td>
</tr>
<tr>
<td>Sudan Ebola Virus &amp; HLIU Staffing</td>
<td>November 2022</td>
<td>Presentations and Small Group Discussions</td>
</tr>
<tr>
<td>Transport</td>
<td>February 2023</td>
<td>Presentations and Small Group Discussions</td>
</tr>
<tr>
<td>International HLIU Survey Results</td>
<td>May 2023</td>
<td>Presentations and Small Group Discussions</td>
</tr>
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**Table 7**

<table>
<thead>
<tr>
<th>IPP Global Rounds Topics, Dates, and Formats</th>
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<tr>
<td>Topic</td>
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<tr>
<td>-------</td>
</tr>
<tr>
<td>Mopox</td>
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</tr>
<tr>
<td>Transport</td>
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<tr>
<td>International HLIU Survey Results</td>
</tr>
</tbody>
</table>

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**Table 8**

<table>
<thead>
<tr>
<th>HLU Topic of Interest</th>
<th>% indicating a best practice in the topic</th>
<th>% indicating a challenge with the topic</th>
</tr>
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<tbody>
<tr>
<td>Staffing</td>
<td>42%</td>
<td>71%</td>
</tr>
<tr>
<td>Training</td>
<td>68%</td>
<td>58%</td>
</tr>
<tr>
<td>Environmental/infection, prevention, and control</td>
<td>61%</td>
<td>23%</td>
</tr>
<tr>
<td>Physical infrastructure/design</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>Coordination or outreach to other hospitals, stakeholders, or public health</td>
<td>39%</td>
<td>65%</td>
</tr>
<tr>
<td>Waste management</td>
<td>52%</td>
<td>32%</td>
</tr>
<tr>
<td>Testing</td>
<td>42%</td>
<td>19%</td>
</tr>
<tr>
<td>Transport</td>
<td>42%</td>
<td>48%</td>
</tr>
<tr>
<td>Load-balancing of patients during surge events</td>
<td>29%</td>
<td>48%</td>
</tr>
<tr>
<td>Access to medical countermeasures</td>
<td>39%</td>
<td>48%</td>
</tr>
<tr>
<td>Research</td>
<td>39%</td>
<td>55%</td>
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</table>

— New South Wales Biocontainment Center, Sydney, Australia
Five subject matter experts from NETEC visited the National Center for Global Health and Medicine (NCGM) in Tokyo, Japan, for collaboration-setting discussions. While there, NETEC members had the opportunity to tour the NCGM high-level isolation unit and observe two drills.

Collaborating with NETEC has been transformative for Japanese infectious disease preparedness, I think. It provided me not just with knowledge but a clear understanding of infectious disease networks and the critical role they play in safeguarding U.S. and international public health. The training and guidance received have not only enhanced my knowledge but also connected me with U.S. stakeholders who manage high-consequence infectious diseases. In parallel, it has empowered me to actively promote the exchange of technical information and knowledge between Japan’s experts and NETEC researchers, fostering a collaborative environment for tackling infectious diseases. This experience has broadened my horizons in terms of understanding treatment and research for special pathogens, comparable to NETEC’s role within the NSPS. The purpose of Dr. Hibino’s extended stay was to learn firsthand the NETEC infrastructure and operations by spending time at Bellevue and Emory, joining SPRN workgroup meetings, participating in monthly calls with the IPP Director and Program Manager, and attending RESPiT training and exercises. She was also a frequent attendee of Global Rounds and a participant in the International Transport Tabletop Exercise in San Francisco.

In May 2023, Christa Arguinchona, the program manager for the Special Pathogens Unit (SPU) and the Rapid Response Team at Providence Sacred Heart Medical Center and Children’s Hospital in Spokane, Washington, and Caroline Croyle Persson, the Program Director for the Mountain Plains Regional Disaster Health Response System and biocontainment unit at Denver Health, attended the annual meeting of German HLIUs at the Robert Koch Institute in Berlin. Dr. Persson in Berlin also attended the annual meeting of German HLIUs at the Robert Koch Institute. The Advisory Group also agreed to continue collaboration-setting discussions between NCGM and NETEC. While at NCGM, the NETEC team presented an overview of NETEC and information about SPRN’s central Institutional Review Board (IRB) that is used for rapid clinical research. The hosts at NCGM conducted two different drills and provided insight into their role during the COVID-19 pandemic, training requirements and assessment strategies, criteria for and coordination of Japanese biocontainment units, and clinical research. Finally, the NETEC team was able to walk through NCGM’s biocontainment unit while using Avattur, a 360° video streaming platform, which enabled NETEC team members who did not take the trip to participate in the tour virtually.

Facilitated by IPP, UNMC’s Nebraska Biocontainment Unit (NBU) is participating in a pilot “Twinning,” a dynamic peer-to-peer collaboration that includes networking and the exchange of ideas and resources. The UNMC/NBU and NCGM’s Disease Control and Prevention Center began Twinning in April 2023 and will finish a 3-year pilot in March 2024, although the hope is for the relationship between the two organizations to continue. The NBU/NCGM Twinning has included bimonthly calls to share experiences and practices for HLIU operations and piloting the use of the Avattur 360° streaming platform to facilitate virtual tours of HLIUs. A second Twinning pilot began this year between Providence Sacred Heart and the Surrey Biocontainment Unit in Surrey, British Columbia, Canada. IPP is evaluating the two Twinning experiences in order to build a toolkit that encourages and facilitates other biocontainment units to match with an international peer, exchange ideas and resources, and learn best practices.

International Technical Support Services (TSS)

IPP has also been able to provide support services to international colleagues in less formal settings (e.g., email) as HLIUs have reached out to NETEC with questions. In Feb 2023, IPP, with the assistance of NETEC subject matter experts, was able to field inquiries from peers in Australia, Canada, and South Korea. Biocontainment unit development, protocols for testing samples, and perspectives on the Ebola vaccine for health care workers were among the topics these countries asked about.

In-Person Networking Opportunities

In fall 2022, IPP Director Dr. Jocelyn Herstein was invited to Berlin, Germany, to observe a three-day bioterrorism exercise hosted by the Robert Koch Institute and Berlin Police. Dr. Herstein participated with other international partners as an exercise observer, specifically focusing on the intake of patients and an exercise assisting German partners in the development and revision of standard operating procedures, which were presented and discussed at a follow-up workshop in February 2023.

In May 2023, Christa Arguinchona, the program manager for the Special Pathogens Unit (SPU) and the Rapid Response Team at Providence Sacred Heart Medical Center and Children’s Hospital in Spokane, Washington, and Caroline Croyle Persson, the Program Director for the Mountain Plains Regional Disaster Health Response System and biocontainment unit at Denver Health, attended the annual meeting of German HLIUs at the Robert Koch Institute in Berlin. As co-leads for the NETEC Biocontainment Leadership workgroup, Christa and Caroline presented lessons learned from U.S. RESPiTc for biocontainment infrastructure and operations. In addition to the seven German HLIUs, representatives from HLIUs in Spain, the Netherlands, France, and Germany also provided information about their units and recent experiences.

In Feb 2023, the IPP team established an Advisory Group of core HLIU partners to guide IPP activities and ensure relevancy and value to the internal HLIU community. The Advisory Group consists of members from countries with similar national systems of HLIUs, including the United Kingdom, Germany, and Singapore. The Advisory Group was kicked off at an in-person meeting in San Francisco in June 2022. The Advisory Group meeting gave IPP and its global peers an opportunity to set an agenda for the current year that emphasized priorities revealed in the International HLIU survey and took into consideration the current HCID landscape.

International Transport Tabletop Exercise

The February 2023 Global Rounds on transport reinforced the relatively limited global capabilities for long-range air transport of a patient with a high-consequence infectious disease. To identify current global capacities and capabilities, and to begin to address gaps, NETEC organized an international transport tabletop exercise. Held in San Francisco, California, on June 2, 2023, representatives from 14 organizations participated in the exercise, including U.S. federal agencies, Phoenix Air Group, and key transport stakeholders from the United Kingdom, Singapore, Japan, Germany, and Norway. Major takeaways recommended the global collaboration on transport continue with further relationship building and additional exercises to build upon existing knowledge. Evaluation data also demonstrated that participants believed the tabletop allowed for agency practice and capability improvements as well as increased understanding about the current international transport landscape. Through the success and findings from this exercise, NETEC will emphasize ongoing domestic and international transport coordination activities.

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— Dr. Hiromi Hibino, NCGM Senior Research Fellow who served as a NETEC Guest from August 2022 to July 2023

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While continuing to navigate the complexities of global health challenges, NETEC remains steadfast in its mission to foster collaboration and ensure that health care systems worldwide are equipped to respond effectively to emerging threats. This annual report serves as a testament to NETEC’s achievements, highlights the challenges it has faced, and outlines ongoing initiatives that position NETEC as a leader in infectious disease preparedness and response. Through collective efforts, NETEC stands ready to address the evolving landscape of special pathogens and contribute to a safer and more resilient global health community.

ACKNOWLEDGMENTS

The accomplishments detailed in this report were made possible by the hard work and dedication of numerous individuals and organizations. It is impossible to mention them all here by name, however NETEC extends its heartfelt gratitude to the subject matter experts, clinicians, public health professionals, and other members of the 13 Regional Emerging Special Pathogens Treatment Centers, as well as to our public health partners and international partners. NETEC is funded by the U.S. Department of Health and Human Services (HHS) Administration for Strategic Preparedness and Response (ASPR).

Christa Arguinchona
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Dennis Bente
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Carrie Billman
Kate Boulter
Chad Bowman
M. Jana Broadhurst
Karie Brouillard
Mary Brown
Julie Bulson
Mike Carr
Sharon Vanairsdale Carrasco
Charlie Cass
Jennifer Chambers
Justin Chan
Barry Clark
Britton Clark
Nicole Cloutier
Caroline Croyte Persson
Jennifer Cuzzolina
Kristi DeHaai
Priya Dhagat
Wael ElRayes
Sarah Emerson
Heather Escudero
Crystal Evans
Jared Evans
Laura Evans
Meredith Fahy
William Fischer
Jade Flinn
Claudia Flores
Gally Frank
Jake Fray
Andrea Frazier
Kari Gand
Brian Garbaldi
Jennifer Garland
Shawn Gibbs
Bruce Gordon
Jonathan Grien
Dalal Gutik
Corey Hardin
Gavin Harris
Brooke Henrikson
Vicki Herrera
Jocelyn Henstein
Angela Hewlett
Hiromi Hibino
Lindsay Hicks
Susan Hodd
John Horton
Tina Hovorka
Nichole Huff
Janet Hume
Amya Husain
Noreen Hynes
Chimora Imomugo
Amy Irwin
Alex Isakov
Shane Kappler
Hedi Keeler
Katie Kjeldgaard
Allison Klaibor
Susan Klise
Radhika Kondapolly
Sylvia Koo
Chris Kratovil
Lekshmi Kumar
Stefanie Lane
LoAnn Larson
James Lawler
Corri Levine
Josephine Lok
Anthony LoPiccolo
Abbey Lowe
John Lowe
Joseph Lukowski
Syrja Madad
Benjamin Mattson
Susan McLellan
Amy Mead
Kelly Medero
Aneesh Mehta
Wade Miles
Jill Morgan
Margie Morgan
Vikramjit Mukherjee
Joanna Mundy
Zuzanna Nahum
Jason Noble
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Faye Pagal
Moby Para
Emma Parsons
Lisa Pastery
Aileen Patel
Vishal Patey
Alyssa Perry
Talin Pibavian
Radu Pestelnicu
Connie Price
Rachel Prudhomme
Vanessa Rabe
Nithya Ramasamy
Randall Reinster
Joselyn Rhodes
Melissa (Missy) Rhodes
Michelle Rogers
Mark Romig
Darrell Ruby
Lauren Sauer
Shelly Schwedhelm
Eileen Searle
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Sophia Shea
Erica Shenoy
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Ronnie Wong
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Kyong Yun
Kimon Zachary
Stephanie Zechmann