2023 Global High-Consequence Infectious Disease Transport Tabletop Exercise

NETEC AFTER-ACTION REPORT

NETEC IPP
EXERCISE DATE: JUNE 2, 2023
EXERCISE LOCATION: SAN FRANCISCO, CA, USA

COVER PAGE OF KEY FINDINGS

On June 2, 2023, the National Emerging Special Pathogens Training and Education Center (NETEC) held a discussion-based tabletop (TTX) exercise to review and evaluate global plans and processes for long-range air transport of high-consequence infectious disease (HCID) cases. Participants included key stakeholders from organizations in six countries: the United States, the United Kingdom, Germany, Norway, Singapore, and Japan. The TTX tested the coordination, prioritization, and plans for using HCID transport capabilities when multiple countries simultaneously request support in aeromedical evacuation of their citizens from the outbreak zone to a facility in their country for management and care. The TTX began to identify long-range HCID transport capacity needs and strategies to enhance those capacities.

Key Findings

1. Resources

1.1. Global capabilities and capacity for long-range air transport of patients with viral hemorrhagic fevers are extremely limited, with many countries relying on the same resources for transportation of their citizens.

2. Planning

2.1. Countries and organizations have standard operating procedures on decision-making for internal patient placement of a confirmed case within their country, but processes for exposed individuals are not consistently developed.

2.2. Mechanisms to place foreign nationals in countries' high-level isolation units could provide enhanced care for individuals whose countries-of-origin are geographically distant from the outbreak region or do not have high-level isolation capabilities, increase turnaround time of the limited global air transportation assets, and enhance a coordinated global response.

2.3. When interpreted and applied appropriately, Department of State 607 agreements, used for countries or organizations requesting Phoenix Air Group's biocontainment transportation services, can enhance international cooperation and coordination.

3. Coordination

3.1. Processes for determining global prioritization of transports when requests exceed capacity remain unclear and warrant further discussion.

3.2. A central coordinating center for international transportation of patients with HCIDs could inform transportations and high-level isolation care and increase international cooperation.

4. Communication

4.1. Transportation organizations have communications plans for providing in-flight updates on patient status during transportation.

4.2. Effective communications across multiple agencies, facilities, and countries are critical to an efficient and secure transport.

ADMINISTRATIVE INFORMATION

1. The title of this document is the *2023 Global High-Consequence Infectious Disease Transport Tabletop Exercise After Action Report/Improvement Plan.*

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EXECUTIVE SUMMARY

On June 2, 2023, the National Emerging Special Pathogens Training and Education Center (NETEC) International Partnerships and Programs (IPP) held a discussion-based tabletop (TTX) exercise for the purpose of reviewing and evaluating global processes and plans for patient long-range high-consequence infectious disease (HCID) air transport. The TTX focused on international capabilities and access points for transport of patients with HCIDs. It tested the coordination, prioritization, and plans for using HCID transport capabilities when multiple countries simultaneously request support in aeromedical evacuation of their citizens from the outbreak zone to a high-level isolation unit (HLIU) in their country for management and care. The exercise also began to identify capacity needs for HCID medical evacuations and strategies to enhance those capacities.

This After-Action Report (AAR) provides key information for enhancing efforts to expand global capabilities and capacities for long-range HCID air transport. The AAR provides an overview of the TTX, summarizes and analyzes exercise results, identifies strengths to be maintained, and supports development of recommendations and next steps to advance the field.

The suggested actions in this AAR should be viewed as recommendations only. In some cases, the organizations involved in this exercise may determine that the benefits of implementation are insufficient to outweigh the time and costs; in other cases, these organizations may identify alternative solutions that are more effective or efficient.

Exercise Planning

Initial planning for the HCID Transport TTX began in March 2023, in response to discussions with US domestic and international partners on the relatively limited resources and capabilities for long-range HCID air transport. The exercise was conducted as a no-fault event and designed to provide an opportunity for key transport stakeholders from multiple countries to identify and discuss issues, policies, resources, strategies, and planning goals for air medical evacuation of suspected or confirmed HCID cases or individuals with a high-risk HCID exposure.

The exercise planning team was composed of transportation subject matter experts from NETEC's Emergency Medical Services (EMS) workgroup and IPP. This team determined objectives for the scenario, developed the scenario, and organized logistics for the exercise. Based on the exercise planning team's deliberations, the following goals and objectives were developed for the HCID Transport TTX:

Goals

1. Provide insights into international capabilities and access points for transport of patients with HCIDs.
2. Test plans for using high-level isolation transport capabilities when multiple countries simultaneously request support in aeromedical evacuation of their citizens to a HLIU in their country for management and care.
3. Understand prioritization processes for determining transports when requests exceed capacity.
4. Improve agility of actions to transport patients with HCIDs.
5. Begin to identify capacity needs for HCID medical evacuations and strategies to enhance those capacities.

Objectives

1. Identify prioritization processes for decision-making when requests exceed capacity to transport.
2. Organize cooperation among HCID transport stakeholders.
3. Determine potential barriers to transport of multiple patients.
4. Identify solutions for enhancing agility and response.

Exercise Evaluation

The exercise was designed as a foundation for improving global capabilities and coordination for long-range air transport of HCID cases and for understanding the capabilities and processes for each of the participating organizations. The exercise focused on supporting and enhancing open communication and a free flow of ideas between various US and international partners. To capture the data that was highlighted during this exercise, a combination of subject matter expert evaluators and scribes were used. Additionally, each person was asked to complete a Participant Feedback Form indicating his or her findings from the exercise. A summary of this data can be found in Appendix B.

Key Findings

This report identifies the key findings and areas of improvement identified and discussed during the NETEC HCID Transport Tabletop exercise. The findings are organized into the following sections: Resources, Planning, Coordination, and Communication.

1. Resources

1.1. Global capabilities and capacity for long-range air transport of patients with viral hemorrhagic fevers are extremely limited, with many countries relying on the same resources for transportation of their citizens.

Recommendations:

- NETEC, leveraging its international and federal partnerships, should coordinate a mapping of existing global capabilities for long-range air transport of viral

hemorrhagic fever (VHF) cases and identify other existing groups or agencies (e.g., North Atlantic Treaty Organization [NATO]) that can support this baseline assessment. To inform this mapping, a common agreement of core capabilities and requirements for safe and effective VHF air transport should be developed.
- Conduct a formal evaluation of the point at which global need for VHF patient transport will exceed capacity.
- Identify strategies to enhance global transport capabilities among exercise participants and other key stakeholders.
- NETEC, in collaboration with TTX participating organizations, should explore and identify the key stakeholders (e.g., NATO, Asia-Pacific Economic Cooperation, World Health Organization, European Commission's Directorate-General for Health and Food Safety) that need to be briefed on findings and involved in future conversations and exercises to address global HCID transportation gaps.
- Elevate discussions regarding limited global HCID air transport capabilities and advocate for resourcing, training, capacity development, and national and international policy changes.
- NETEC should coordinate future exercises with US Regional Emerging Special Pathogens Treatment Centers to identify and test alternative domestic transport plans during a large international repatriation if the federally contracted organization is unavailable.

2. Planning

2.1. Countries and organizations have standard operating procedures on decision-making for internal patient placement of a confirmed case within their country, but processes for exposed individuals are not consistently developed.

Recommendations:

- Given the recent reorganization of the US Administration for Strategic Preparedness and Response (ASPR), ASPR should review and identify the person who decides final patient placement in the US, informed by NETEC recommendations and state health departments. A decision tree, created by NETEC in collaboration with ASPR, for how patients are distributed across US HLIUs could help inform NETEC recommendations.
- Continue conversations and sharing of decision-making factors between TTX participants and other global stakeholders to inform best practices for transport and management of exposed but well individuals.
- NETEC should work with participating organizations and other global stakeholders to create an international framework (e.g., global playbook, toolkit) for transportation considerations and decision-making during HCID case movement and placement.
- Review international and national policies that can be updated to better support coordination and decision-making of exposed individuals and confirmed HCID cases.

2.2. Mechanisms to place foreign nationals in countries' high-level isolation units could provide enhanced care for individuals whose countries-of-origin are geographically distant from the outbreak region or do not have high-level isolation capabilities, increase turnaround time of the limited global air transportation assets, and enhance a coordinated global response.

Recommendations:

- Explore international mutual aid through discussion at G7 about countries' considerations for accepting foreign nationals into a HLIU and which countries would consider aiding with patient transport of non-citizen/foreign nationals.
- NETEC should leverage its international collaboration network and international partners to facilitate discussions on scenarios and challenges with managing non-citizen/foreign nationals in HLIUs.
- Explore a "hub and spoke" model for transportation (air to air or air to ground) of multiple patients or exposed individuals by bringing these conversations to higher levels within each of the participating organizations. A follow-up exercise may be repeated in a year, with the inclusion of high-level decision-makers from each organization and country.

2.3. When interpreted and applied appropriately, Department of State 607 agreements, used for countries or organizations requesting Phoenix Air Group's biocontainment transportation services, can enhance international cooperation and coordination.

Recommendations:

- Department of State and participating organizations should review and revisit 607 agreements for currency and content.
- Explore creating advanced agreements with participating organizations and other key transportation stakeholders to formulate a trusted program.

3. Coordination

3.1. Processes for determining global prioritization of transports when requests exceed capacity remain unclear and warrant further discussion.

Recommendations:

- Transportation organizations should provide clarity on decision-making processes, including prioritization processes for their transport assets when requests exceed capacity.
- Develop criteria for how patients/exposed individuals are placed and transport assets assigned.
- Conduct follow-up exercises to develop strategies and processes for prioritization and coordination.

- NETEC should leverage its global partnerships and working relationships with US federal stakeholders to support and inform prioritization.
- NETEC will provide Department of State with the NETEC 24/7 line to limit delays in communications and to offer support in patient placement decisions within the aircraft.

3.2. A central coordinating center for international transportation of patients with HCIDs could inform transportation and high-level isolation care and increase international cooperation.

Recommendations:

- Further explore the value and responsibilities of a coordinating body for international HCID transportation, as well as national security implications for sharing information.
- Discuss with participants and other key stakeholders the organization(s) most well positioned to fill the coordinating body role.
- Discuss with participants and other key stakeholders the organization(s) most well positioned to convene clinicians and other stakeholders for clinical knowledge-sharing calls when high-level isolation units are managing repatriated patients.

4. Communication

4.1. Transportation organizations have communications plans for providing in-flight updates on patient status during transportation.

Recommendations:

- Transportation organizations should conduct trainings and exercises to inform effective management of communications and parameters of information provided.
- Transportation and coordinating organizations should manage expectations on level of information provided in-flight to other agencies and local transportation and receiving facility teams.
- Transportation and coordinating organizations should determine what patient-related information is critical to the successful patient handoff and transport so that they can standardize the information provided, when it is provided, and what is expected by the receiving organization.

4.2. Effective communications across multiple agencies, facilities, and countries are critical to an efficient and secure transport.

Recommendations:

- Decision-making agencies, transportation and coordinating organizations, and high-level isolation units should determine what patient-related information and other related scenario information is critical to the decision to transport.

- Global agreements (e.g., the Department of State 607 agreement), high-level isolation unit readiness, and transport assets/capabilities should be categorized and periodically updated to better inform decision-makers.
- Decision-making agencies, facilities, and countries should standardize what, when, and how transport-related information will be disseminated and test communication plans when possible.

EXERCISE OVERVIEW

Exercise Details

Exercise Name
2023 Global High-Consequence Infectious Disease Transport Tabletop Exercise

Exercise Date and Time
June 2, 2023, from 08:00 – 14:30

Location
San Francisco, California, USA

Sponsors
This exercise was sponsored by the National Emerging Special Pathogens Training and Education Center (NETEC) International Partnerships and Programs (IPP) through the Fiscal Year 2023 NETEC grant. NETEC is funded by the US Administration for Strategic Preparedness and Response (ASPR).

Goals and Objectives
The goals of this exercise were to:

1. Provide insights into international capabilities and access points for transport of patients with high-consequence infectious diseases (HCIDs).
2. Test plans for using high-level isolation transport capabilities when multiple countries simultaneously request support in aeromedical evacuation of their citizens to a high-level isolation unit (HLIU) in their country for management and care.
3. Understand prioritization processes for determining transports when requests exceed capacity.
4. Improve agility of actions to transport patients with HCIDs.
5. Begin to identify capacity needs for HCID medical evacuations and strategies to enhance those capacities.

The objectives of this exercise were to:

1. Identify prioritization processes for decision-making when requests exceed capacity to transport.
2. Organize cooperation among HCID transport stakeholders.
3. Determine potential barriers to transport of multiple patients.
4. Identify solutions for enhancing agility and response.

Exercise Design Team, Evaluators, and Support

The following NETEC faculty comprised the Exercise Design Team: Jocelyn Herstein, Lauren Sauer, Shawn Gibbs, Katie Stern, John Lowe, Wade Miles, Alex Isakov.

Facilitators: Shawn Gibbs, Jocelyn Herstein, Abigail Lowe, Lauren Sauer, Tim Uyeki.

Evaluators: John Lowe, Darrell Ruby, Shawn Vasoo, William Walters.

Scribes: Erin Baumgartner, Britton Clark, Rachel Prudhomme, Sophia Shea, Sami Vasistha.

Participating Organizations

A total of 25 people participated in the exercise as players, representing the following organizations:

US Participating Organizations

- National Emerging Special Pathogens Training & Education Center (NETEC)
- US Administration for Strategic Preparedness and Response (ASPR)
- US Department of Defense
- US Department of State
- Phoenix Air Group

International Organizations

- Charité Berlin/Robert Koch Institute, Germany
- Oslo University Hospital/Norwegian RescEU Jet Air Ambulance Team, Norway
- National Center for Global Health and Medicine, Japan
- Ministry of Health, Labor and Welfare, Japan
- National Center for Infectious Diseases, Singapore
- Royal Free London, United Kingdom
- UK Health Security Agency, United Kingdom
- Royal Air Force, United Kingdom

EXERCISE DESIGN SUMMARY

The NETEC Global High-Consequence Infectious Disease (HCID) Transport Tabletop Exercise (TTX) was designed to evaluate player actions against current response plans and capabilities for long-range air transport of patients with HCIDs.

Purpose and Scope

The HCID TTX provided an opportunity for key transport stakeholders from six countries to identify issues, policies, capabilities, approaches, and planning goals for long-range HCID air transport. The exercise focused on international capabilities and access points for transport of patients with HCIDs. It tested the coordination, prioritization, and plans for using HCID transport capabilities when multiple countries simultaneously request support in aeromedical evacuation of their citizens to a high-level isolation unit in their country for management and care. The emphasis was also on identifying capacity needs for HCID medical evacuations and strategies to enhance those capacities.

Exercise Program Participants

As designed by the exercise design team, participants were assigned the following roles, as applicable to the objectives of the exercise:

- Players: Players responded to the situation presented based on expert knowledge of response procedures, current plans and procedures, and insights derived from training.
- Facilitators: Facilitators were involved with the discussion-based exercise and provided situation updates and moderated group discussions. They also provided additional information or answered questions, as required.
- Scribes: Scribes did not have an active role in the discussions, but recorded all exercise play as near verbatim as possible.
- Evaluators: Evaluators were chosen based on their expertise and their ability to constructively comment on exercise response activities. They had passive roles during the exercise and provided exercise-related evaluation documentation following the exercise.

Scenario Summaries

This tabletop exercise focused on a confirmed case of Sudan ebolavirus and a large-scale, high-risk exposure event involving individuals of different nationalities. The exercise included two modules, both centered around the same scenario. Module 2 takes place 31 hours after Module 1. Players were guided through the scenarios using multiple formats. An oral briefing simulating an interagency briefing was provided with the detailed information known at that time in the scenario, followed by questions and answers from participants. Additionally, participants were provided summarized information about the scenario in one-pager handouts and PowerPoint slides.

Module 1: Presentation of Request

Scenario, June 2, 2023 at 08:00 EDT

The scenario starts with notification of a confirmed PCR-positive case of Sudan ebolavirus, during a large-scale outbreak in Uganda. The outbreak has, to date, resulted in 2,821 cases and 1,044 confirmed deaths; most have been reported in Uganda, but cases have also been reported in South Sudan, the Democratic Republic of the Congo, and Kenya. Two confirmed cases outside of the outbreak region have also been confirmed in travelers. The outbreak, which has been declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization, has solicited a large international response to the region.

The index case in this scenario, an American physician, tested PCR-positive for Sudan ebolavirus while on deployment in Uganda with Médecins Sans Frontières (MSF)/Doctors Without Borders. The case had close contact, while symptomatic, with 18 individuals between May 28-29: 4 individuals while traveling, including a Ugandan driver and 3 healthcare worker colleagues, and 14 individuals in a dormitory. The close contacts include citizens from the US, UK, Uganda, Germany, Japan, Norway, and Spain.

Discussion Questions

1. Describe the current transport capabilities and plans to provide repatriation of a highly exposed or confirmed VHF case(s) back to a high-level isolation unit or quarantine location in the country.
    a. What are the transport organizations beginning to prepare?
    b. What contracts or agreements are currently in place for this scenario?
    c. What transport modalities are available for this scenario?
        i. What are the capacities of these?
    d. Describe the process, including turnaround time, to ready the transport capability for another use.
    e. What challenges, barriers, or gaps are there for providing transport?
    f. Is there anything else in this point in the scenario your organization would be considering or planning for, or any other information you need?

2. Describe the decision-making process to activate a request for repatriation of citizens/residents to your country after confirmation of a positive patient or of an individual with a significant exposure.
    a. Who is involved in the decision-making process?
    b. How long does this decision take?
    c. Which organization(s) would be contacted to complete the transport?
    d. What is the first step in initiating the process for transportation request?
    e. Is there anything else at this point in the scenario your organization would be considering or planning for, or any other information you need?

Scenario Update: Evening of June 2

Reports come that the driver (Ugandan citizen, identified as a UK resident and married to a British citizen in an earlier inject) and the German and British healthcare workers that traveled with the PCR-positive case while they were symptomatic begin to develop symptoms. In addition, a Spanish citizen that had dinner on 28 May and breakfast on 29 May with the index patient has reported symptoms. Specimens from all symptomatic contacts are being taken and sent to the laboratory for diagnostic testing.

Discussion Questions

3. Describe how patients would be assigned to transport providers and modalities.
    a. How are the use of those modalities determined?
    b. What challenges might occur during multiple transport requests?
    c. What plans do you have for a staff exposure?
    d. What additional resources might be needed when requests potentially exceed an organization's capacity?
    e. Is there anything else in this point in the scenario your organization would be considering or planning for, or any other information you need?

Module 2: Communications and Transport

Scenario, June 3, 2023 15:00 EDT

No patients or individuals have been moved at this time. Specimens from the symptomatic Spanish healthcare worker and the German healthcare worker have tested PCR-positive for Sudan ebolavirus. Results from diagnostic testing of specimens from the symptomatic British healthcare worker and the driver (Ugandan citizen, UK resident) have yet to be received. The American healthcare worker that traveled with the index patient on 28 May has reported symptoms. In addition, a Japanese healthcare worker that had contact with the index patient in the dormitory has reportedly become symptomatic; however, details are unavailable at this time. In total: the index case (American citizen) and 2 contacts (German citizen and Spanish citizen) have been confirmed to have Sudan ebolavirus, 2 additional contacts are awaiting laboratory test results (Ugandan citizen/UK resident and British citizen), and 2 contacts have recently become symptomatic (Japanese citizen and American citizen).

Discussion Questions:

1. What is your communication plan with authorities for international transport?
    a. Are there any special processes for refueling, including logistics of the air transport with multiple supporting agencies?
    b. How do you expect to receive or transmit information during transport?
    c. What information will be disseminated to the other organizations and the public?
    d. Is there anything else in this point in the scenario your organization would be considering or planning for, or any other information that would be needed?



KEY FINDINGS

This report identifies the key findings and areas of improvement identified and discussed during the NETEC HCID Transport Tabletop Exercise. The findings are organized into the following sections: Resources, Planning, Coordination, and Communication.

1. Resources

1.1 Global capabilities and capacities for long-range air transport of patients with viral hemorrhagic fevers are extremely limited, with many countries relying on the same resources for transportation of their citizens.

During the 2013-2016 West Africa Ebola virus disease (EVD) epidemic, countries prepared to facilitate the evacuation and repatriation of nationals supporting the response in West Africa (e.g., healthcare workers) who had been exposed to or confirmed to have EVD. A single transportation organization was responsible for the majority of these transports. During and after the West Africa EVD epidemic, several countries or organizations developed their own transportation capabilities, although many have since been decommissioned or are not considered mission-ready for long-range viral hemorrhagic fever (VHF) transport.

Few countries or organizations have their own transport capabilities, with most relying on one company (Phoenix Air Group) that itself has limited resources for multiple transports in a short time frame. Any request for the use of Phoenix Air Group's biocontainment transport capabilities must go through the Department of State, which owns the contract for use of those transportation capabilities and assets. The Department of State leads and coordinates those transports, while Phoenix Air Group performs the medical evacuation operations. For other countries that do have their own capabilities, in many cases, those transport capabilities are military and might be conserved for that country's citizens, limiting their availability for international assistance. Moreover, current global conflicts have pulled resources that otherwise could be available for aeromedical evacuations. It was noted that if current transportation capacities were to be exceeded, some organizations that are not currently ready would start preparations (e.g., identifying agreements, developing or refining standard operating procedures).

The scenario in this TTX – that of a large-scale, significant exposure event to Sudan ebolavirus of 18 close contacts of varying nationalities – is very plausible and would result in multiple countries simultaneously requesting support in aeromedical evacuation of their citizens to their home country for monitoring or management. The current capabilities of the organizations that would be receiving transportation requests in this scenario would be rapidly exceeded, particularly as exposed individuals become symptomatic or seroconvert. Of the participating organizations, only 2 had current long-range air transportation capabilities for viral hemorrhagic fevers (Phoenix Air Group/US Department of State and UK Royal Air Force); the others have existing or would explore 607 agreements with the US Department of

State for long-range transportation of their citizens or personnel. This reliance on a single organization's transportation assets has implications for global capacity and ability to transport multiple patients or individuals at a time, and prompts a conversation on prioritization and multinational coordination, discussed in following sections. Moreover, it prompts the need to elevate these findings and discussions to national and international levels (e.g., national authorities, NATO) and encourage policy-level discussions.

There is no set database or collection of global long-range VHF air transport capabilities. A mapping of existing collective global capabilities and capacities, as well as their limitations and use cases (e.g., national assets only available for a country's citizens), would significantly improve the current understanding of air transportation gaps, needs, and implications for scenarios such as that designed for this TTX. Similarly, a common agreement internationally of the core requirements or minimum standards for safe, effective VHF air transport would inform the assessment of global capabilities and which assets are truly viable.

In the United States, many US regional concept of operations rely on a federal contract with the transport organization that would likely be involved in the international repatriation from the outbreak region. Implications from exercise findings will need to inform further standard operating procedures for intra-US transport plans when those assets are not available domestically because they are required for international missions.

Recommendations:

- NETEC, leveraging its international and federal partnerships, should coordinate a mapping of existing global capabilities for long-range air transport of VHF cases and identify other existing groups or agencies (e.g., NATO) that can support this baseline assessment. To inform this mapping, a common agreement of core capabilities and requirements for safe and effective VHF air transport should be developed.
- Conduct a formal evaluation of the point at which global need for VHF patient transport will exceed capacity.
- Identify strategies to enhance global transport capabilities among exercise participants and other key stakeholders.
- NETEC, in collaboration with TTX participating organizations, should explore and identify the key stakeholders (e.g., NATO, Asia-Pacific Economic Cooperation, World Health Organization, European Commission Directorate-General for Health and Food Safety) that need to be briefed on findings and involved in future conversations and exercises to address global HCID transportation gaps.
- Elevate discussions regarding limited global HCID air transport capabilities and advocate for resourcing, training, capacity development, and national and international policy changes.
- NETEC should coordinate future exercises with US Regional Emerging Special Pathogens Treatment Centers to identify and test alternative domestic transport plans during a large international repatriation if the federally contracted organization is unavailable.

2. Planning

2.1. Countries and organizations have standard operating procedures on decision-making for internal patient placement of a confirmed case within their country, but processes for exposed individuals are not consistently developed.

Exercise participants noted having plans and processes in place for determining where a confirmed patient would be placed upon repatriation, including procedures to identify and communicate with the receiving ground transportation team and high-level isolation unit.

During the exercise, the question was raised on plans for how exposed but well individuals and exposed and symptomatic individuals would be transported, as well as where they would be placed following repatriation. Different countries reported different plans for use of home quarantine vs. placement in a high-level isolation unit or other healthcare facility to monitor exposed but well individuals, as well as for how long they'd remain in that designated location. In the US, NETEC makes recommendations for patient placement, but the final decision-maker was not able to be identified. It was noted that with ASPR reorganization, this should be reviewed and the decision-maker identified. Moreover, in collaboration with ASPR, NETEC should develop a decision tree to inform patient placement, identifying the decision-making factors (e.g., geography, access to medical countermeasures, state health department decision) that inform patient placement recommendations.

There was also discussion on appropriate monitoring of asymptomatic exposed individuals in situ, recognizing this is informed by several factors, including costs and individual preference. One organization noted that it is easier to stand down than stand up transport capabilities, so they would preposition an evacuation if a citizen had a high-risk exposure. Participants also noted the significant impact on teams providing care for the community that is enduring the outbreak to lose large numbers of asymptomatic exposed individuals who may or may not need care when they arrive in their home country.

In terms of transporting exposed but well individuals, the question arose on how those transportations would happen, i.e., if they would use biocontainment transport systems or be transported through other mechanisms. Some noted business class seating could be used, while other countries would consider chartering a flight, pending a cost comparison, particularly if there were multiple exposed but well individuals needing transport. These options would preserve the capacity of transport capabilities for confirmed cases.

Recommendations:

- Given the recent ASPR reorganization, ASPR should review and identify the person who decides final patient placement in the US, informed by NETEC recommendations and state health departments. A decision tree, created by NETEC in collaboration with ASPR, for how patients are distributed across US high-level isolation units could help inform NETEC recommendations.

- Continue conversations and sharing of decision-making factors between TTX participants and other global stakeholders to inform best practices for transport and management of exposed but well individuals.
- NETEC should work with participating organizations and other global stakeholders to create an international framework (e.g., global playbook, toolkit) for transportation considerations and decision-making during HCID case movement and placement.
- Review international and national policies that can be updated to better support coordination and decision-making of exposed individuals and confirmed HCID cases.

2.2. Mechanisms to place foreign nationals in countries' high-level isolation units could provide enhanced care for individuals whose countries-of-origin are geographically distant from the outbreak region or do not have high-level isolation capabilities, increase turnaround time of the limited global air transportation assets, and enhance a coordinated global response.

A key discussion during the exercise was on openness to and mechanisms for caring for foreign nationals in high-level isolation units. The use case for this identified during the exercise was twofold: 1) some countries are too far away from the outbreak zone to transport a sick patient or have no current high-level isolation capabilities, and 2) to increase turnaround times of the existing air transportation assets.

Several countries have had discussions with other countries on caring for foreign nationals in their high-level isolation unit, because they are too far from the outbreak region to transport an unwell patient, do not have existing high-level isolation capabilities, or for contingency planning if their high-level isolation unit is unavailable. However, no agreements are in place, and decisions would be made on a case-by-case basis. There is precedence for this from several European countries that cared for foreign nationals in their high-level isolation unit during the 2013-2016 EVD epidemic. For countries that are too far from the outbreak region, the question arose if they would transport mildly symptomatic patients; the ethics and optics of repatriating a mildly symptomatic but not a "sick" patient should be addressed in future scenario planning.

One of the key discussions during the exercise centered around transporting foreign nationals to a location in Europe to increase turnaround time and response times of air transportation assets when there are multiple patients or individuals needing repatriation within a short time frame. For example, a central drop-off point could be established in a European country (given exercise scenario of an outbreak in East Africa), with back-and-forth trips made between Uganda and Europe rather than North America or Asia. This would increase efficiency of crews and other air transportation logistics and minimize duration of care in the air. Moreover, in the exercise scenario, this would allow for increased capacity per transport; however, it would be important to identify costs prior to transport if multiple entities/payers are being transported on a single flight. Once received at the central drop-off location, other

intra-European transportation agencies could potentially load balance to other European high-level isolation units.

Recommendations:

- Explore international mutual aid through discussion at G7 about countries' considerations for accepting foreign nationals into a high-level isolation unit and which countries would consider aiding with patient transport of non-citizens/foreign nationals.
- NETEC should leverage its international collaboration work and international partners to facilitate discussions on scenarios and challenges with managing non-citizen/foreign nationals in high-level isolation units.
- Explore a "hub and spoke" model for transportation (air to air or air to ground) of multiple patients or exposed individuals by bringing these conversations to higher levels within each of the participating organizations. A follow-up exercise may be repeated in a year, with the inclusion of high-level decision-makers from each organization and country.

2.3. When interpreted and applied appropriately, Department of State 607 agreements, used for countries or organizations requesting Phoenix Air Group's biocontainment transportation services, can enhance international cooperation and coordination.

Department of State 607 agreements, which are key for initiating Phoenix Air Group biocontainment transport services, are payment mechanisms but also address key logistical considerations, including refueling stops, decontamination locations, and overflights. They are signed by organizations and countries, including the World Health Organization; the 607 agreement with WHO, through its deployment mechanisms and standby partnerships, covers a number of other organizations (e.g., MSF) that deploy during international responses.

The agreements do have expiration dates, and it was noted during the exercise that they should be reviewed for currency and to ensure they are broad enough to cover a range of care. These pre-agreements could also be leveraged to seek cooperation between countries and their high-level isolation units (as noted in section 2.2); a network of agreements could create a type of 'confederation'.

Recommendations:

- Department of State and participating organizations should review and revisit 607 agreements for currency and content.
- Explore creating advanced agreements with participating organizations and other key transportation stakeholders to formulate a trusted program.

3. Coordination

3.1. Processes for determining global prioritization of transports when requests exceed capacity remain unclear and warrant further discussion.

A key objective of the tabletop exercise was to begin to understand prioritization processes of transportation capabilities when requests potentially exceed capacity. A country would prioritize their transportation capabilities for their citizens; however, a transportation organization with contracts from several countries will receive requests singularly and begin to ready assets. If multiple requests are received, it is important for prioritization processes to be understood before an event by contracting countries/organizations to prevent delays in transportation and patient care, and to identify alternative means of transportation or clinical management, if needed.

Participants discussed prioritizing patients for the limited transport resources based on clinical status (e.g., symptoms and day of illness). Conversely, due to barriers and gaps in obtaining clinical information about the patients getting rapidly readied for transport that might delay decision-making, it was suggested to treat it as a logistics exercise and repatriate all individuals as quickly as possible. Triaging invites political issues due to optics of prioritizing one country over another; this latter approach minimizes that. No resolution or specifics on current prioritization processes were identified during the exercise.

Additionally, the exercise scenario highlighted the need to consider how confirmed patients and/or exposed individuals (both asymptomatic and symptomatic) would be placed during transports of multiple individuals, using multi-patient transportation systems.

Recommendations:

- Transportation organizations should provide clarity on decision-making processes, including prioritization processes for their transport assets when requests exceed capacity.
- Develop criteria for how patients/exposed individuals are placed and transport assets assigned.
- Conduct follow-up exercises to develop strategies and processes for prioritization and coordination.
- NETEC should leverage its global partnerships and working relationships with US federal stakeholders to support and inform prioritization.
- NETEC will provide Department of State with the NETEC 24/7 line to limit delays in communications and to offer support in patient placement decisions within the aircraft.

3.2. A central coordinating center for international transportation of patients with HCIDs could inform transportations and high-level isolation care and increase international cooperation.

Participants highlighted the value of "small calls"/coordination calls during the 2013-2016 West Africa EVD epidemic, albeit for single requests at the time. For this scenario, with multiple simultaneous requests, the gap in a formal coordinating mechanism for international transportation was amplified. Such a coordinating body could serve as a global platform for routinely and quickly assessing the readiness of international high-level isolation units to help inform patient placement and prioritization. This is particularly relevant for scenarios where requests are exceeding transport capacities and more rapid turnaround times of transport capabilities will prevent delays for moving the next patient(s), generating discussions around foreign national placement in another country's high-level isolation unit. The coordinating organization can help determine units ready and willing to provide patient care and inform prioritization of patient movement based on clinical status, available receiving facilities, and available transportation capabilities. Importantly, a standard approach and understanding of the definition of readiness would need to be developed. However, there may be national security implications for sharing this type of information that need to be explored.

During the hotwash, a similar discussion centered on coordination of clinical calls during outbreaks of HCIDs and care of repatriated patients in high-level isolation units. This was previously done in 2014, led by the US Centers for Disease Control and Prevention, to share challenges, successes, information on managing patients, medical countermeasures, and compassionate care. Participants noted that NETEC, through its International Partnerships and Programs, could potentially convene these types of calls during outbreaks or epidemics where high-level isolation units are caring for repatriated patients.

Recommendations:

- Further explore the value and potential responsibilities of a coordinating body for international HCID transportation, as well as national security implications for sharing information.
- Discuss with participants and other key stakeholders the organization(s) most well positioned to fill the coordinating body role.
- Discuss with participants and other key stakeholders the organization(s) most well positioned to convene clinicians and other stakeholders for clinical knowledge-sharing calls when high-level isolation units are managing repatriated patients.

4. Communication

4.1. Transportation organizations have communications plans for providing in-flight updates on patient status during transportation.

Managing expectations of providing real-time information during flights is critical; too many updates can negatively impact missions by focusing crew energy away from patient care. Estimated time of arrival and updates on landing times are important information to

communicate, but transport organizations noted they only planned to provide updates on patient status if there was a drastic change. However, it is important from receiving ground transportation and receiving facility perspectives to know high-level needs, such as central lines or anesthesia.

Recommendations:

- Transportation organizations should conduct trainings and exercises to inform effective management of communications and parameters of information provided.
- Transportation and coordinating organizations should manage expectations on level of information provided in-flight to other agencies and local transportation and receiving facility teams.
- Transportation and coordinating organizations should determine what patient-related information is critical to the successful patient handoff and transport so that they can standardize the information provided, when it is provided, and what is expected by the receiving organization.

4.2. Effective communications across multiple agencies, facilities, and countries are critical to an efficient and secure transport.

Logistic challenges of air transport can be compounded with ineffective inter-agency and inter-country communications. Communications and agreements on flight permits and refueling stops in particular are critical to prevent transport delays. The publicity and attention that will inevitably come from a HCID repatriation will elicit questions and requests from everyone from the public to high-level government officials. It's important that transportation and coordinating organizations get ahead of these questions. Moreover, patient confidentiality should be at the forefront of identifying what can and should be shared. Information exchange should generally be limited to need-to-know officials and in high security methods. When considering placement of foreign nationals into a high-level isolation (as discussed in Finding 2.2), communications to the community will be important to mitigate repercussions of community backlash or potential xenophobia of a hospital providing care to a non-citizen.

Recommendations:

- Decision making agencies, transportation and coordinating organizations, and high-level isolation units should determine what patient-related information and other related scenario information is critical to the decision to transport.
- Global agreements (e.g., the Department of State 607 agreement), high-level isolation unit readiness, and transport assets/capabilities should be categorized and periodically updated to better inform decision-makers.
- Decision-making agencies, facilities, and countries should standardize what, when, and how transport-related information will be disseminated and test communications plans when possible.

ACTION ITEMS AND CONCLUSIONS

The HCID Air Transport Tabletop Exercise provided US and international organizations an opportunity to discuss implementing response actions, as well as engage in candid discussions about response, resource, and capability challenges during a scenario requiring multiple long-range air transports of confirmed, suspected, or exposed cases of a viral hemorrhagic fever. The TTX was a vital first step in increasing the international coordination and cooperation of countries and transportation agencies involved in these types of events. It provided an opportunity to test and discuss individual countries' plans and processes, as well as how that coordination fits within the international response context. Participating organizations can take the increased understanding of the international landscape and lessons learned from the exercise to further develop and refine their plans and decision-making processes.

Several opportunities were identified during this exercise, all which require further discussion with relevant partners. Exploring international mutual aid could increase efficiency of multi-patient transportations, but discussions are needed about acceptance of foreign nationals, and which countries would consider aiding with patient transport. Policy-level discussions are needed at the highest levels, from national authorities to regional and international agencies. Moreover, there is an opportunity for a more formal mechanism to coordinate international transportations and knowledge-sharing calls between clinicians caring for repatriated patients. More conversation is needed on which group(s) are well positioned to support and lead these efforts. Follow-up discussions with the WHO, NATO, and other international and transnational organizational stakeholders that were not present at the exercise are needed.

This tabletop should serve as a foundation for which future discussions and exercises are built upon, both within individual countries and between global partners. There is opportunity for NETEC to facilitate coordination of future meetings and exercises with this participant group and other key stakeholders. While tabletop discussions are valuable in generating discussion and awareness of processes, and testing organizations' plans, the lessons learned through functional and full-scale exercises have far-reaching impacts to individual organizations' processes as well as larger global coordination and readiness. There is a need to stand up full-scale, international transportation exercises to test, refine, and advance global transportation capabilities, especially considering the gaps and challenges identified during this tabletop.

Air medical evacuation of HCID cases provides a controlled mechanism for safely repatriating confirmed, suspected, or exposed cases. The limited global resource availability of assets for these specialized transports and remaining questions on allocation and prioritization of those resources has implications for global readiness and response. There is opportunity for this participant group to advocate for funding, resourcing, and advancement of transport capabilities both within their countries and globally. Further discussions and exercises can address gaps identified during this tabletop and identify specific solutions for enhancing agility of actions and response to HCID transportation.

APPENDIX A: PARTICIPANT FEEDBACK FORM

NETEC HCID AIR TRANSPORT TABLETOP EXERCISE
Friday, June 2, 2023
POST-EXERCISE FEEDBACK FORM

PART 1: GENERAL INFORMATION

Name: _____

Agency: _____

Position Title: _____

Exercise Role:

- o Player
- o Facilitator
- o Observer
- o Evaluator

PART 2: EXERCISE DESIGN & CONDUCT

Please rate the following items on a scale of **1 (strongly disagree) to 5 (strongly agree)**. Provide comments below if appropriate.

1. The exercise was well-structured and organized.	1 Strongly disagree	2	3	4	5 Strongly agree

Comments:

2. The exercise scenario was plausible and realistic.	1 Strongly disagree	2	3	4	5 Strongly agree

Comments:

3. Participation in the exercise was appropriate for someone in my position.	1 Strongly disagree	2	3	4	5 Strongly agree

Comments:

4. The exercise allowed my agency to practice and improve priority capabilities.	1 Strongly disagree	2	3	4	5 Strongly agree

Comments:

5. After this exercise, I believe my agency is better prepared to deal successfully with the scenarios exercised.	1 Strongly disagree	2	3	4	5 Strongly agree

Comments:

6. This exercise increased my understanding about our current continuity plans, procedures, capabilities, and resources.	1 Strongly disagree	2	3	4	5 Strongly agree

Comments:

PART 3: PARTICIPANT FEEDBACK

7. What were three strengths of today's exercise?

8. What were three challenges or limitations to today's exercise?

9. After today's exercise, what are the most important next steps for your agency?

10. After today's exercise, what are the most important steps for this group of transport stakeholders?

11. Please provide any other comments, recommendations, or suggestions.

APPENDIX B:
PARTICIPANT FEEDBACK SUMMARY

Introduction

Immediately following the HCID Air Transport Tabletop Exercise, participants were asked to complete exercise evaluation feedback forms. These forms were created to solicit participant perceptions of and recommendations for the exercise through six Likert items and qualitative feedback on the exercise and perceived next steps via open-ended questions. Quantitative responses were entered into Excel, and response counts, medians, and means were calculated. Qualitative responses were read, thematically coded, reread, and condensed into the final codes.

Participants

Evaluation participants (N=30) included those of varying roles and represented 15 transport stakeholder organizations across six countries. Exercise roles included Player (n=25), Facilitator (n=2), and Evaluator (n=3).

Quantitative Results

Likert questions and response means and medians are represented in the tables below. Each item was rated on a five-point scale, Strongly Disagree (1) to Strongly Agree (5).

Table 1. Quantitative Feedback Form from TTX Participants (N=30)

Item	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean	Median
1. The exercise was well-structured and organized.	0	0	0	2	28	4.93	5
2. The exercise scenario was plausible and realistic.	0	0	0	1	29	4.96	5
3. Participation in the exercise was appropriate for someone in my position.	0	0	3	5	22	4.63	5
4. The exercise allowed my agency to practice and improve priority capabilities.	0	0	6	3	21	4.5	5
5. After this exercise, I believe my agency is better prepared to deal successfully with the scenario exercised.	0	0	8	12	10	4.07	4
6. This exercise increased my understanding about our current continuity plans, procedures, capabilities, and resources.	0	0	4	9	17	4.43	5

Overall, participants positively rated the structure and organization of the exercise as well as exercise scenario, with all 30 participants either agreeing or strongly agreeing with the corresponding statement. Additionally, all participants agreed or strongly agreed that the exercise scenario was plausible and realistic.

An overarching goal of the TTX was to provide value to both individuals and the agencies they represent. In terms of individual participation, 73% (n=22) of participants strongly agreed that they were the correct stakeholder to represent their agency in the TTX. Furthermore, 10% (n=3) neither disagreed nor agreed with the statement and 30% (n=5) agreed with the statement.

Results from the two questions on the utility of the exercise showed the most diversity. While each item had responses that positively reflected on the TTX, room for improvement was conveyed; however, interpretation of these results are limited due to various confounding factors such as baseline agency preparedness and proper stakeholder agency representation. Seventy percent (n=21) of participants strongly agreed with the statement "The exercise allowed my agency to practice and improve capabilities." Six respondents neither disagreed nor agreed with the statement and three others agreed with the statement.

Demonstrating the TTX's value, 57% (n=17) strongly agreed with the statement "This exercise increased my understanding about our current continuity plans, procedures, capabilities, and resources." Perhaps most interestingly, and indicative of the need for continued development and pursuit of next steps for air transport of individuals with HCIDs, were the responses for the question: "After this exercise I believe my agency is better prepared to deal successfully with the scenario exercised." Most participants (40%; n=12) agreed with this statement while 33% (n=10) strongly agreed. Eight (27%) of participants neither disagreed or agreed with being better prepared after the exercise.

Qualitative Results

Exercise participants provided qualitative feedback to the exercise development team on the execution and content of the tabletop (Table 2).

Table 2. Participant Identified Strengths and Challenges

Tabletop Strengths	Tabletop Challenges
Participants were the right people for the exercise	Some key players such as organizational decision-makers were missing
Exercise was well organized and facilitated, and delivered well	Did not allow for enough cross-table conversations and scenario was too US-focused
Scenario was plausible and realistic	Not enough time to do full exercise
Provided networking opportunities across agencies and countries	Global gaps in transport planning and capabilities
Specific takeaways included improved understanding of global transport challenges	

Thematic results align with quantitative responses. Many respondents commented on how well the exercise was attended and appreciation of the multinational representation. A general highlight was that with the "right" people in the room there was time to network with peers. Others positively commented on how the exercise was developed, managed, and executed. Some participants noted specific positive takeaways from the exercise such as learning about the global transport landscape and peer capabilities.

Interestingly, the themes for perceived challenges mirrored many of those mentioned as strengths, although with different interpretation. Some participants noted that not all of the correct agencies or organizational representatives were in the room (e.g., decision-makers). Several participants stated more time was needed for the TTX, "Great discussion, but more time or a two-day event would have been nice." Other challenges included: too limited of a scenario, too limited discussion time and ability to interact with other tables, and a disproportionate emphasis on the United States.

Upon reflecting on the TTX, participants listed what they identified as next steps for both their individual agency as well as for the group as a whole (Table 3). At the agency level, participants noted the need to create and update existing policies and procedures including those centered around communication and logistics. They also noted the need to continue relationship building with other agencies in the room whether that be through meetings or additional training or exercises. In addition, participants noted that internal agency dialogue and decision making also need to occur. Much of the feedback on next steps for the group involved continued dialogue on the topic with a focus on across-organization and intercountry discussion, sharing findings from the day, and relationship-building with Department of State.

Table 3: Thematic Next Steps for Individual Stakeholder Agencies and the TTX Group

Agency Next Steps	Participant Group Next Steps
Development and advancement of planning protocols	Continue discussion across agencies to ensure transport stays a priority
Communication within the agency and with others in the group to define plans	Close loop on exercise results by sharing findings and learnings
Additional exercises at the local/national level to discuss more local transport needs	Plan and execute similar exercises and collaboration opportunities
	Coordinate with Department of State on roles and logistics