United States Health Security National Action Plan:

Strengthening Implementation of the International Health Regulations based on the 2016 Joint External Evaluation

October 2018

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The International Health Regulations (2005) (IHR),[1] overseen by the World Health Organization (WHO), seek "to prevent, protect against, control, and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade." The IHR reflect countries' commitment to building national capacities required to rapidly identify threats to human health and undertake quick action to prevent a public health event from becoming a public health emergency of international concern (PHEIC). In late 2015, WHO adopted the Joint External Evaluation (JEE) as a voluntary mechanism to evaluate IHR implementation through a multisectoral approach.[2] Based on the evaluation methodology developed for the Global Health Security Agenda (GHSA), the JEE is a voluntary, peer-to-peer, collaborative process that combines GHSA infectious disease targets with the all-hazards approach to public health preparedness and response required for implementation of IHR. The JEE Tool consists of four thematic areas: *Prevent*, *Detect*, *Respond*, and *Other IHR-Related Hazards and Points of Entry*, which cover 19 technical areas with specific targets and performance indicators. The JEE of the United States, conducted in May 2016, identified strengths and gaps in U.S. capacities to prevent, detect, and respond to public health emergencies. Following the 2016 JEE, an interagency, multisectoral IHR Working Group developed the "United States Health Security Action Plan: Strengthening Implementation of the International Health Regulations based on the 2016 Joint External Evaluation".

On behalf of the U.S. government, the Department of Health and Human Services' Office of the Assistant Secretary for Preparedness and Response (ASPR), which maintains the U.S. National Focal Point (NFP) for the IHR, led the development of the National Action Plan in collaboration with over 40 federal departments and agencies with a role in human, animal, plant, and environmental health across the 19 technical areas. ASPR continues to work with these federal partners to coordinate the plan's implementation until the next JEE of the United States in 2021.[3]

During the 2016 JEE, U.S. and international subject-matter experts identified high priorities for improvement in technical areas with lower capacities, but also identified actions that would reinforce, sustain, and further optimize capacities that are already highly rated according to the JEE Tool. As such, the National Action Plan contains actions items for all JEE technical areas, which take into account the unique aspects of the United States systems that support national health security. These unique aspects of the U.S. systems include, among other things, the size and diversity of our country and our population, the nature of the federal system of government and the criticality of state and local capacities, as well as the amount of global travel and trade to/from the United States. The National Action Plan is intended to be a dynamic framework that can evolve with new legislation, policies, programs, technologies, and financial resources. During the implementation period, individual departments and agencies will continue to apply a multisectoral approach to address each action item while utilizing established programs or developing new programs to collaborate with state, local, tribal, and territorial

[1] WHO. International Health Regulations, 3rd edition.
[2] *See* WHO. Partnership Portal: IHR Monitoring and Evaluation Framework.
[3] *See* The White House. "Executive Order -- Advancing the Global Health Security Agenda to Achieve a World Safe and Secure from Infectious Disease Threats" (November 4, 2016).

(SLTT) authorities. All activities listed in the National Action Plan are subject to the availability of funds as authorized and/or appropriated by the U.S. Congress, as well as funding limitations faced by SLTT authorities.

Importantly, the National Action Plan derives from, maintains alignment with, underscores, and supports the goals and implementation plans of other federal statutory and policy obligations, including the United States' National Security Strategy, the National Health Security Strategy (NHSS), the National Biodefense Strategy (NBS), and other important federal initiatives and partnerships that aim to strengthen public health emergency preparedness, response, and recovery capacities in the United States. The National Action Plan not only shares similar objectives, but also includes activities that seek to coordinate and align implementation efforts with those undertaken in those strategies. At the technical level, the National Action Plan contains action items derived from and consistent with national plans and initiatives that include, among others, the National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB), and those plans and initiatives at the national-international interface, such as the GHSA, the North American Plan for Animal and Pandemic Influenza (NAPAPI), and the Global Health Security Initiative (GHSI). The synergetic relationship with other key health security efforts is critical to maximizing implementation of the National Action Plan.

Consistent with WHO and GHSA goals for international transparency, action items for all 19 technical areas are listed in detail in the full National Action Plan. The following sections provide high-level descriptions of the priority actions within the ten areas that received either a capacity level indicator of "3" (the lowest capacity level for the United States) or mostly "4s" on the JEE scale of 1 to 5.[4] The priority capacities for strengthening are described below in the order that they appear in the WHO JEE Tool and the National Action Plan.

Antimicrobial Resistance (AMR)

The JEE Self-Assessment indicated the availability of federal and state-level capacities to detect antimicrobial resistant bacteria, though many SLTT authorities had insufficient access to laboratories that can detect and characterize resistance according to published standards; that the implementation of a One Health approach to surveillance and reporting of resistance required alignment and coordination; and that antimicrobial stewardship programs were being developed, although implemented inconsistently and not fully monitored.

Efforts will focus on expanding capabilities at existing public health laboratories; characterizing and following trends in AMR, including the emergence of new bacterial strains and resistance mechanisms; fostering multisectoral and multidisciplinary collaboration, including through public-private partnerships; and strengthening antimicrobial stewardship activities. The action items align with the CARB, a comprehensive national plan for the federal government developed through an interagency process that identifies critical actions necessary to combat the emergence and spread of antibiotic-resistant bacteria.

[4] 1- No Capacity, 2- Limited Capacity, 3- Developed Capacity, 4- Demonstrated Capacity, 5- Sustainable Capacity

Zoonotic Disease

Although there are programs connecting human, animal, and environmental health (some of which are well coordinated for specific zoonoses), the overall federal approach to One Health currently remains informal. Surveillance and information systems across sectors are largely separate from one another. Departments and agencies involved in public health security need to formally share and align their priorities for zoonotic disease prevention, detection, and response.

Efforts will focus on incorporating the One Health approach to addressing zoonotic diseases nationally and through collaboration across departments and agencies. The first priority is to create a shared vision and roadmap for a more formal approach to One Health. Multiple federal departments and agencies will convene a multisectoral One Health Zoonotic Disease Prioritization workshop to: (a) prioritize the zoonotic diseases of greatest national concern for human, animal, and environmental health sectors that are responsible for federal zoonotic disease programs to address; and (b) develop plans for implementing and strengthening multisectoral approaches to address these diseases in the United States. This work will allow departments and agencies to develop jointly a list of necessary action items and next steps for strengthening One Health approaches to integrate surveillance systems, laboratory systems, joint outbreak response capacity, preparedness planning, and cross-sector prevention and control strategies.

Food Safety

Food safety programs are largely effective, but there are still challenges in detecting multistate outbreaks with lack of access to specialized laboratories at all local levels. Efforts focus on enhancing detection and reporting of foodborne illness outbreaks and progressively developing additional, state-of-the-art laboratory testing capabilities in state and local public health laboratories. These include next-generation whole genome sequencing (WGS) and related technologies, methods and platforms, and advanced computational and bioinformatics tools for enhanced pathogen identification.

Biosafety and Biosecurity

Overall, systems for biosafety and biosecurity in the United States are strong, yet there remain areas for improvement with respect to federal oversight and the availability of standardized training. The focus will be on implementing two sets of recommendations, one from the Federal Expert Security Advisory Panel (FESAP),[5] which conducted an internal federal government review of biosafety and biosecurity practices, and another from the Fast Track Action Committee on Select Agent Regulations (FTAC-SAR),[6] which conducted an external review that focused on the effects of the select agent regulations on researchers and laboratories. Recommendations made by both the FESAP and FTAC-SAR address the culture of responsibility, oversight, outreach, and education; applied biosafety research; incident reporting;

[5] *See* Report of the Federal Experts Security Advisory Panel (FESAP) (December 2014).
[6] *See* Fast Track Action Committee Report: Recommendations on the Select Agent Regulations Based on Broad Stakeholder Engagement (October 2015).

material accountability; inspection processes; regulatory changes; and guidance to improve biosafety and biosecurity. Implementing the FESAP and FTAC-SAR recommended actions is anticipated to strengthen biosafety and biosecurity practices and oversight activities. The United States is committed to fostering progress in the life sciences, including peaceful research involving Biological Select Agents and Toxins (BSAT)[7] and non-BSAT, while at the same time ensuring that such work is being conducted in a safe and secure manner. The United States will also continue to implement policies regarding dual use research of concern.

Real-Time Surveillance

The United States has an extensive system for public health surveillance that is capable of quickly detecting major outbreaks. However, there are inconsistent linkages between key aspects of the human and animal surveillance systems, and there could be significant improvements in the rapid acquisition, processing, and interpretation of electronic data. Efforts will focus on further integration and rapid exchange of surveillance information among departments and agencies, testing and improving interoperability of electronic health care records, and increasing trained personnel at the SLTT levels to strengthen surveillance systems. Activities will also include the development and promotion of indicator-based surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface.

Preparedness

The United States has complex federal and SLTT structures for public health emergency preparedness and response, which necessitate consistency and coordination in response plans and systems. Efforts will focus on continuing to strengthen emergency preparedness through technology platforms; developing new—and enhancing existing—multi-platform tools and resources; coordinating planning for responding to complex incidents that do not receive Stafford Act declarations through such activities as exercises linked to the Biological Incident Annex to the Response and Recovery Federal Interagency Operational Plans and the National Response Framework that include state and local partners in exercises (e.g., the Pandemic Influenza exercise, Gotham Shield nuclear/radiological response exercise, and recent past exercises linked to Zika Virus responses); developing formal guidance that standardizes post-event/exercise corrective action plans (CAP) and the after action review/reporting (AAR) processes used by federal and SLTT public health planners; and collaborating among federal and SLTT partners to develop higher quality and more inclusive public health concept of operations (CONOPS), documents, and exercises.

Emergency Response Operations

Most federal departments and agencies have well-established emergency operations center (EOC) capacities, and those centers are connected and coordinated centrally during a major public health emergency. However, not all of the centers perform as effectively or efficiently as

[7] Biological agents and toxins that HHS and USDA have determined to have the potential of posing a severe threat to both human and animal health, plant health, or animal and plant products.

possible, and many of the state-level EOCs do not consistently plan or exercise adequately for public health emergencies.

Efforts will focus on involving more federal and SLTT jurisdictions in national level exercises (NLE) and ensuring that best practices and lessons learned are shared at all levels of government, in order to improve outcomes, internal and external communication, information sharing, and situational awareness, and to establish a common operating picture during events and exercises. Federal departments and agencies will also work to establish EOC standards and incident management systems (IMS) for situational awareness, staffing, and staff education and training; provide federal support to SLTT programs to increase local capacities to identify, hold, treat, and transport patients with a highly infectious disease (HID) or who are physically contaminated; and assist local medical networks to identify facilities capable of receiving such patients and coordinate with EMS providers.

Risk Communication

The United States has a very effective system for developing risk communications at the federal level that involves all of the key departments and agencies. However, during the earliest stages of a response, various departments and agencies may conduct communication operations more independently and less cohesively. There are not enough personnel trained in handling major emergencies, with too few who can surge where and when needed.

Efforts will focus on promoting community engagement and evaluating the current capacities and challenges among SLTT partners, and working with them to develop training and staffing plans to improve the number of qualified risk communicators. Action items will include training around complex situations and specific (rare) hazards; surveying national risk communication partners and media outlets to develop a plan to address existing gaps and shortfalls in community engagement and readiness; and conducting exercises to test those plans.

Chemical Events

The United States has an adequate system in place to identify chemical events quickly. However, local laboratories and health departments require improvements in their capacity for rapid risk assessments and diagnostics. Efforts will focus on federal government departments and agencies developing additional guidance for preparedness at the SLTT level, and developing and stockpiling improved medical countermeasures (MCMs) for chemical exposures; expanding the number of laboratories in the Environmental Response Laboratory Network (ERLN); evaluating the variations in SLTT capacities; and developing tools to assist them in reviewing and improving their local capacities to provide a medical response to a large-scale chemical event.

Radiation Emergencies

While early radiation detection is generally available across the country, few locations have the ability to assess dose and conduct post-event risk assessments. Efforts will focus on developing laboratory bioassays for the remaining priority radionuclides and disseminating the tests to designated labs across the country; increasing the overall capacity within DOE and DoD to conduct radiobiodosimetry testing including characterization and validation of new methods;

collaborating with U.S. hospitals to identify locations that could potentially adopt standardized biodosimetry methods and coordinate to enable responses to larger-scale exposures; increase number of radiation professionals through education, work experience, and increasing awareness of the profession; and collaborating with SLTT health departments and Public Health Emergency Preparedness (PHEP) grant awardees to raise awareness of their potential role in a radiation emergency response, to provide them with guidance on emergency response preparations, and to enhance situational awareness between partners in a radiological response.

PURPOSE AND SCOPE

The JEE of the United States, conducted in May 2016, identified strengths and gaps in U.S. capacities to prevent, detect, and respond to public health emergencies based on the Joint External Evaluation Tool: International Health Regulations (2005) (JEE Tool). The purpose of the *United States Health Security National Action Plan: Strengthening Implementation of the International Health Regulations based on the 2016 Joint External Evaluation* is to describe how the United States will continue to address the highest priority gaps identified during the 2016 JEE. The Joint External Evaluation of the United States of America Self-Assessment Report (originally published May 2016 and revised in September 2016) (JEE Self-Assessment) describes the United States health security capacities, strengths, gaps, and challenges in great detail. The Joint External Evaluation of IHR Core Capacities of the United States of America – Mission Report (June 2016) (JEE Mission Report) also describes the essential elements of that assessment as well as the recommendations received from the panel of external subject-matter experts during the 2016 JEE.

The Office of the Assistant Secretary for Preparedness and Response (ASPR), which maintains the U.S. IHR NFP and performs the required monitoring and evaluation of U.S. compliance with the IHR, led the development of the National Action Plan and will continue coordinate the plan's implementation until the next U.S. JEE in 2021. During this period, federal government departments and agencies will continue to follow established program cycles to work with state, local, tribal, and territorial (SLTT) authorities, operating within their own mission areas, mandates, and budgets. As such, all activities listed in the National Action Plan were included without consideration of potential competing priorities and are subject to the availability of funds as authorized by the U.S. Congress.

The National Action Plan captures programs and activities of individual departments and agencies or groups that have been approved under the current budget and that specifically support reaching the JEE targets. The U.S. Government's self-assessment in 2016 and the discussion with the external assessors resulted in areas for improvement in all 19 technical areas, including those where the United States capacities are already rated highly according to the JEE Tool. The U.S.-specific gaps and challenges were subsequently discussed among interagency partners in 2017, and those priority areas that require further action (including some of the areas that received a "5") are now reflected in the National Action Plan. The National Action Plan aims to optimize the health security of the United States based on the country's unique risks, challenges, and resources while using the JEE indicators as guidance.

The National Action Plan aligns with and fully supports the goals and activities of the United States' National Security Strategy, NHSS, NBS, and other important federal initiatives and partnerships that aim to strengthen public health emergency preparedness, response, and recovery capacities in the United States. Other examples of such alignment include the CARB, GHSA, NAPAPI, and GHSI, among many others.

The National Action Plan is intended to be a dynamic framework that can evolve as a result of development of new legislation, policies, programs, technologies, and budget changes. The National Action Plan is not intended to be a budget or commitment document. All activities included in this document are subject to budgetary constraints and other approvals, including the weighing of priorities and available resources by the Administration in formulating its annual budget and by Congress in legislating appropriations.

U.S. GOVERNMENT INTERAGENCY STAKEHOLDERS

The following federal government stakeholders are currently involved in the development, coordination, and/or implementation of the National Action Plan:

Department of Health and Human Services (HHS)

ASPA	Office of the Assistant Secretary for Public Affairs
ASPR	Office of the Assistant Secretary for Preparedness and Response **(Lead Coordinator)**
AHRQ	Agency for Healthcare Research and Quality
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare & Medicaid Services
FDA	Food and Drug Administration
HRSA	Health Resources and Services Administration
IHS	Indian Health Service
NIH	National Institutes of Health
NVPO	National Vaccine Program Office
OASH	Office of the Assistant Secretary for Health
OGA	Office of Global Affairs
OGC	Office of the General Counsel
OSG	Office of the Surgeon General

Department of Agriculture (USDA)

AMS	Agricultural Marketing Service
APHIS	Animal and Plant Health Inspection Service
ARS	Agricultural Research Service
FSIS	Food Safety Inspection Service
NIFA	National Institute of Food and Agriculture

Department of Commerce (DOC)

Department of Defense (DoD)

ASDHA	Office of the Assistant Secretary of Defense for Health Affairs
OUSDP	Office of the Under Secretary of Defense for Policy

Department of Energy (DOE)

NNSA	National Nuclear Security Administration

Department of Homeland Security (DHS)

CBP	U.S. Customs and Border Protection
FEMA	Federal Emergency Management Agency
CWMD	Countering Weapons of Mass Destruction Office

Department of the Interior (DOI)

FWS	U.S. Fish and Wildlife Service
NPS	National Park Service
OEM	Office of Emergency Management
USGS	U.S. Geological Survey

Department of Justice (DOJ)
FBI Federal Bureau of Investigation

Department of Labor (DOL)
OSHA Occupational Safety and Health Administration

Department of State (DOS)
IHB Office of International Health and Biodefense

Department of Transportation (DOT)

Department of Veterans Affairs (VA)
VHA Veterans Health Administration

Environmental Protection Agency (EPA)
OCSPP Office of Chemical Safety and Pollution Prevention
OLEM Office of Land and Emergency Management
ORIA Office of Radiation and Indoor Air
ORD Office of Research and Development
OW Office of Water

Executive Office of the President
NSC National Security Council
OMB Office of Management and Budget
OSTP Office of Science and Technology Policy

Nuclear Regulatory Commission (NRC)

BACKGROUND

The IHR and the JEE Tool

In May 2005, the 58th World Health Assembly adopted significant revisions to the 1969 edition of the IHR. The revised IHR, which entered into force on June 15, 2007, seek "to prevent, protect against, control, and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade." The IHR reflect countries' commitment to building national capacities required to rapidly identify threats to human health and undertake quick action to prevent a public health event from becoming a public health emergency of international concern (PHEIC).

The IHR Article 54 requires that each country conduct a self-assessment and report the results to the WHO. In late 2015, the WHO adopted the JEE Tool and an external assessment process as a voluntary mechanism to evaluate IHR implementation through a multisectoral approach.[8] Other health security organizations such as the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO) also support this mechanism.

The JEE Tool consists of four thematic areas: *Prevent*, *Detect*, *Respond*, and *Other IHR-Related Hazards and Points of Entry*, which cover 19 technical areas with specific targets and performance indicators.

2016 U.S. JEE

The United States conducted a self-assessment of IHR capacities, using the JEE Tool in May 2016, followed by an external evaluation visit later that month. ASPR, in close coordination with the Centers for Disease Control and Prevention (CDC) and with the support from more than 20 federal government departments and agencies, conducted the self-assessment. On May 12, 2016, the external assessment team received the self-assessment. ASPR and CDC co-hosted the JEE technical area discussions with the external assessors from May 23 – 24, 2016, in Washington, DC, and from May 25 – 27, 2016, in Atlanta, GA. During the visit, the external assessors met with more than 120 national subject-matter experts, program leaders, and decision- and policy-makers in smaller groups for each JEE technical area. Both activities resulted in the publication of the U.S. Self-Assessment Report and the U.S. Mission Report.

According to current WHO policy, external evaluations should take place approximately every five years. The United States has committed to volunteering for another JEE in 2021.

[8] *See* WHO. Partnership Portal: IHR Monitoring and Evaluation Framework.

SUMMARY OF THE 2016 U.S. JEE RESULTS

On a scale from 1 to 5 (1- No Capacity, 2- Limited Capacity, 3- Developed Capacity, 4- Demonstrated Capacity, 5- Sustainable Capacity), the United States had a capacity level of "5" in 20 indicators, a "4" in 21 indicators, and a "3" in seven indicators. Table 1 summarizes the technical areas, indicators, and U.S. capacity levels, as determined jointly with the external assessors. The U.S. self-assessment and the discussion with the external assessors identified areas for improvement in all 19 technical areas, including those for which the United States received the highest capacity levels.

Table 1. Summary of 2016 JEE Scores for the United States[9]

Technical Area	Indicator	Capacity Level
PREVENT **P1. National Legislation, Policy, and Financing**	**P1.1** *Legislation, laws, regulations, administrative requirements, policies, or other government instruments in place are sufficient for implementation of the IHR*	**5**
	P1.2 *The state can demonstrate that it has adjusted and aligned its domestic legislation, policies, and administrative arrangements to enable compliance with the IHR*	**5**
P2. IHR Coordination, Communication, and Advocacy	**P2.1** *A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of the IHR*	**5**
P3. Antimicrobial Resistance	**P3.1** *Antimicrobial resistance (AMR) detection*	**4**
	P3.2 *Surveillance of infections caused by AMR pathogens*	**4**
	P3.3 *Health care-associated infection (HCAI) prevention and control programs*	**4**
	P3.4 *Antimicrobial stewardship activities*	**3**
P4. Zoonotic Diseases	**P4.1** *Surveillance systems in place for priority zoonotic diseases/pathogens*	**3**
	P4.2 *Veterinary or animal health workforce*	**4**
	P4.3 *Mechanisms for responding to infectious zoonoses and potential zoonoses are established and functional*	**4**
P5. Food Safety	**P5.1** *Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination*	**4**
P6. Biosafety and Biosecurity	**P6.1** *Whole-of-government biosafety and biosecurity system is in place for human, animal, and agriculture facilities*	**4**
	P6.2 *Biosafety and biosecurity training and practices*	**4**

[9] All of the indicators in Table 1 and throughout this document are taken verbatim from the JEE Tool.

Technical Area	Indicator	Capacity Level
P7. Immunization	**P7.1** *Vaccine coverage (measles) as part of the national program*	**5**
	P7.2 *National vaccine access and delivery*	**5**
DETECT **D1. National Laboratory System**	**D1.1** *Laboratory testing for detection of priority diseases*	**5**
	D1.2 *Specimen referral and transport system*	**4**
	D1.3 *Effective modern point-of-care and laboratory-based diagnostics*	**5**
	D1.4 *Laboratory quality system*	**5**
D.2 Real-Time Surveillance	**D2.1** *Indicator and event based surveillance systems*	**5**
	D2.2 *Interoperable, interconnected, electronic real-time reporting system*	**3**
	D2.3 *Analysis of surveillance data*	**5**
	D2.4 *Syndromic surveillance systems*	**4**
D.3 Reporting	**D3.1** *System for efficient reporting to WHO, FAO, and OIE*	**5**
	D3.2 *Reporting network and protocols in country*	**4**
D.4 Workforce Development	**D4.1** *Human resources are available to implement IHR core capacity requirements*	**5**
	D4.2 *Applied epidemiology training program in place, such as Field Epidemiology Training Program (FETP)*	**5**
	D4.3 *Workforce strategy*	**4**
RESPOND **R.1 Preparedness**	**R1.1** *Multi-hazard national public health emergency preparedness and response plan is developed and implemented*	**5**
	R1.2 *Priority public health risks and resources are mapped and utilized*	**4**
R.2 Emergency Operations Centers	**R2.1** *Capacity to activate emergency operations*	**5**
	R2.2 *Emergency Operations Center operating procedures and plans*	**4**
	R2.3 *Emergency operations program*	**4**
	R2.4 *Case management procedures are implemented for IHR relevant hazards*	**3**
R.3 Linking Public Health and Security Authorities	**R3.1** *Public health and security authorities, (e.g., law enforcement, border control, and customs) are linked during a suspected or confirmed biological event*	**5**

Technical Area	Indicator	Capacity Level
R.4 Medical Countermeasures and Personnel Deployment	**R4.1** *System is in place for sending and receiving medical countermeasures (MCM) during a public health emergency*	**5**
	R4.2 *System is in place for sending and receiving health personnel during a public health emergency*	**4**
R.5 Risk Communication	**R5.1** *Risk communication systems (e.g., plans, mechanisms, etc.)*	**4**
	R5.2 *Internal and partner communication and coordination*	**5**
	R5.3 *Public communication*	**4**
	R5.4 *Communication engagement with affected communities*	**3**
	R5.5 *Dynamic listening and rumor management*	**4**
OTHER IHR HAZARDS	**PoE.1** *Routine capacities are established at PoE*	**4**
Points of Entry (PoE)	**PoE.2** *Effective public health response at PoE*	**5**
Chemical Events	**CE.1** *Mechanisms are established and functioning for detecting and responding to chemical events or emergencies*	**4**
	CE.2 *Enabling environment is in place for management of chemical events*	**5**
Radiation Emergencies	**RE.1** *Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies*	**3**
	RE.2 *Enabling environment is in place for management of radiation emergencies*	**3**

THE IHR WORKING GROUP AND NATIONAL ACTION PLAN PROCESS

Previously created in 2016 as the JEE Working Group, today's federal IHR Working Group continues to be chaired by ASPR and consists of representatives from federal government departments and agencies who collaborated in the development of the U.S. self-assessment and the external evaluation under the JEE. The IHR Working Group is responsible for developing, updating, implementing, and tracking progress of the National Action Plan, with members coordinating implementation of activities under their relevant technical areas in collaboration with other federal bodies, SLTT partners, and non-governmental partners, as needed. The following is the initial follow-up process and timeline for the implementation of the National Action Plan:

- Beginning of the federal monitoring and evaluation process for the United States Health Security National Action Plan – *November 2018*.
- First interagency comprehensive National Action Plan Review and Progress Report Meeting – *January 2019*
- Online publication of the 2018 National Action Plan Progress Report and publication of a revised National Action Plan (if needed) – *February 2019*.
- Second biannual IHR Working Group Action Item Review Meeting – *July 2019*.

This annual schedule of activities iterates until the second JEE of the United States, tentatively planned for mid-2021.

OVERALL STRUCTURE OF THE U.S. HEALTH SECURITY NATIONAL ACTION PLAN

The National Action Plan summarizes the gaps identified in the U.S. self-assessment and the plans to address the external assessors' recommendations for each technical area. The proposed action items in each technical area form the framework for the National Action Plan. Action items are listed according to the JEE recommendations and indicators. Each section consists of:

- A description of the original JEE target and indicators, as provided in the JEE Tool, and the 2016 capacity levels;
- A short summary of the U.S. self-assessment extracted from the U.S. Self-Assessment Report;
- A summary of the recommendations made by the external assessors based on the 2016 JEE; and
- Action items to complete during 2018 – 2020. Each action item lists the main department(s) or agency(ies) that lead its implementation and that are responsible for coordinating with intra- and interagency partners and for reporting on its status on behalf of all involved stakeholders.

All actions items will be worked within the context of the National Response Framework and other appropriate interagency emergency planning, preparedness, response, and recovery frameworks. Such efforts will include coordination with all relevant regulatory agencies for the activities involved.

PREVENT 1 — National Legislation, Policy, and Financing

JEE Target

States Parties should have an adequate legal framework to support and enable the implementation of all of their obligations and rights to comply with and implement the IHR. In some States Parties, implementation of the IHR may require new or modified legislation. Even where new or revised legislation may not be specifically required under the State Party's legal system, States may still choose to revise some legislation, regulations, or other instruments in order to facilitate their implementation and maintenance in a more efficient, effective, or beneficial manner. States Parties should ensure provision of adequate funding for IHR implementation through national budget or other mechanism.

Indicators

P.1.1 *Legislation, laws, regulations, administrative requirements, policies, or other government instruments in place are sufficient for implementation of the IHR*. **2016 Capacity Level: 5**

P.1.2 *The state can demonstrate that it has adjusted and aligned its domestic legislation, policies, and administrative arrangements to enable compliance with the IHR*. **2016 Capacity Level: 5**

Summary of U.S. Self-Assessment

While there are no specific references to the IHR in U.S. legislation, many federal, state, and local laws and policies are sufficient to support implementation of IHR core requirements. However, not all subnational jurisdictions have the same capacities to respond quickly and effectively to emerging public health events because of inadequate policies and financing for public health systems. Federal systems are in place to provide rapid supplementation where needed, but there is a need for comprehensive strategic planning and partner engagement to prepare for modern threats and challenges.

2016 JEE Recommendations from the External Evaluators[10]

1. Continue the evaluation of existing legislation, regulations, and policies to review opportunities that would help improve mechanisms for interagency coordination and response.

[10] All of the recommendations in the U.S. Health Security National Action Plan are from the *Joint External Evaluation of IHR Core Capacities of the United States of America – Mission Report* (WHO, 2017).

2. Engage relevant stakeholders to develop the legislation, regulations, and/or policies that facilitate coordination among sectors at all levels of pre-disaster or pre-emergency situations.

Summary of Actions Items

There are efforts to develop and adjust legal and policy instruments to strengthen the health security of the United States and improve the country's compliance with the IHR. Efforts will focus on the implementation of the NBS, which Congress required through the National Defense Authorization Act (Section 1086).[11] Under guidance from the National Security Council, HHS will host the Biodefense Coordination Team to develop the NBS Implementation Plan, with ASPR designated as the primary manager for the coordination mechanisms. Additionally, the Pandemic and All-Hazards Preparedness Reauthorization Act (PAHPRA) may be reauthorized by Congress in 2018 and a new direction is under development for the next 2019 quadrennial NHSS. To the extent possible, activities in the National Action Plan will support implementation of the NBS and the NHSS.

Action Items

Table 2. JEE RECOMMENDATION 1 (JEE INDICATOR P.1.2): *Continue the evaluation of existing legislation, regulations, and policies to review opportunities that would help improve mechanisms for interagency coordination and response;* and **JEE RECOMMENDATION 2 (JEE INDICATOR P.1.2):** *Engage relevant stakeholders to develop the legislation, regulations, and/or policies that facilitate coordination among sectors at all levels of pre-disaster or pre-emergency situations.*

CY	DEPARTMENTS[12]	ACTION ITEMS	AGENCIES[13]
2018	HHS	Coordinate with federal leads and other stakeholders to evaluate congruency between the U.S. National Action Plan and the NHSS and NBS implementation plans.	ASPR
2018	HHS	Coordinate with relevant actors regarding the reauthorization of PAHPRA and seek new authorities as needed.	HHS Office of the Secretary
2019	HHS	Complete the first NBS Public Report through interagency collaboration.	ASPR
2020	HHS	Complete annual NBS Public Report.	ASPR

[11] U.S. Congress. National Defense Authorization Act of 2017 (December 23, 2016).
[12] Listed in alphabetical order, these are the primary departments of the federal government that have authorities, policies, and programs in place relevant to the specific action items. Other departments (not listed) may also maintain or support functions that are relevant overall in the technical area.
[13] The agency or agencies within the listed departments that are responsible for coordinating the specific action item and reporting progress for the National Action Plan. The coordinating agency may work with multiple other federal and SLTT departments/agencies and non-governmental entities. Other agencies (not listed) may also support implementation of the action item and/or maintain programs that are relevant overall in the technical area.

PREVENT 2 — IHR Coordination, Communication, and Advocacy

JEE Target

The effective implementation of the IHR requires multisectoral and multidisciplinary approaches through national partnerships for effective alert and response systems. Coordination of nationwide resources including the sustainable functioning of an IHR NFP, which is a national center for IHR communications, is a key requisite for IHR implementation. The NFP should be accessible at all times to communicate with the WHO IHR Regional Contact Points and with all relevant sectors and other stakeholders in the country. States Parties should provide WHO with contact details of NFPs and continuously update and annually confirm them.

Indicator

P.2.1 *A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of the IHR*. **2016 Capacity Level: 5**

Summary of U.S. Self-Assessment

A high-quality public health "system of systems" that has evolved over time is the basis for the implementation of the IHR in the United States. Despite implementation since the beginning of 2007, there remain some inconsistent understandings of the roles and responsibilities for IHR implementation among federal and SLTT authorities and stakeholders.

2016 JEE Recommendations from the External Evaluators

1. Bring together stakeholders (federal, state, and local) to discuss the U.S. IHR obligations and identify opportunities to make improvements.
2. Improve training opportunities for state and federal officials to support communication of cases/events between the local level and state officials who understand the implications of IHR.
3. Streamline processes for "pre-assessment" evaluation to determine if a full (federal) IHR assessment is needed.
4. Enhance consistency among federal agencies to ensure that each has an internal IHR protocol that aligns with the IHR NFP processes.
5. Improve the ability of the IHR NFP to communicate health risk information within the federal and state networks.

Summary of Actions Items

Efforts will focus on further strengthening of the U.S. IHR NFP and creating and/or improving awareness, training, processes, and mechanisms that facilitate interagency collaboration across the federal government and integration with SLTT partners towards greater IHR implementation.

Action Items

Table 3. JEE RECOMMENDATION 1 (JEE INDICATOR P.2.1): *Bring together stakeholders (federal, state, and local) to discuss the U.S. IHR obligations and identify opportunities to make improvements;* **JEE RECOMMENDATION 2 (JEE INDICATOR P.2.1):** *Improve training opportunities for state and federal officials to support communication of cases/events between the local level and state officials who understand the implications of IHR;* **JEE RECOMMENDATION 3 (JEE INDICATOR P.2.1):** *Streamline processes for "pre-assessment" evaluation to determine if a full (federal) IHR assessment is needed; and* **JEE RECOMMENDATION 5 (JEE INDICATOR P.2.1):** *Improve the ability of the IHR NFP to communicate health risk information within the federal and state networks.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	Multiple	Develop a series of review fora for national stakeholders based on the National Action Plan to support and refine program implementation.	ASPR
2018	Multiple	Formally review and publish the National Action Plan with updates based on changes to the 2019-2020 priorities.	ASPR
2019	Multiple	Publish the fiscal year 2018 National Action Plan Progress Report.	ASPR
2019	Multiple	Conduct National Action Plan review fora to address technical areas and special topics, as needed.	ASPR
2019	Multiple	Formally review and reissue the National Action Plan with updates based on changes to the 2020 priorities, and determine whether to continue the action plan beyond 2020.	ASPR
2020	Multiple	Publish the fiscal year 2019 National Action Plan Progress Report.	ASPR
2020	Multiple	Conduct National Action Plan review fora to address technical areas and special topics as needed.	ASPR
2020	Multiple	Begin preparations for the follow-up JEE.	ASPR

JEE RECOMMENDATION 4 (JEE INDICATOR P.2.1): *Enhance consistency among federal agencies to ensure that each has an internal IHR protocol that aligns with the IHR NFP processes.*

PREVENT 3 — Antimicrobial Resistance

JEE Target

Support work being coordinated by WHO, FAO, and OIE to develop an integrated global package of activities to combat antimicrobial resistance, spanning human, animal, agricultural, food, and environmental aspects (i.e., a One Health approach) including: a) Each country has its own national comprehensive plan to combat antimicrobial resistance; b) Strengthen surveillance and laboratory capacity at the national and international level following agreed international standards developed in the framework of the Global Action Plan, considering existing standards; and, c) Improved conservation of existing treatments and collaboration to support the sustainable development of new antibiotics, alternative treatments, preventive measures, and rapid, point-of-care diagnostics including systems to preserve new antibiotics.

Indicators

P.3.1 *Antimicrobial resistance (AMR) detection*	**2016 Capacity Level: 4**
P.3.2 *Surveillance of infections caused by AMR pathogens*	**2016 Capacity Level: 4**
P.3.3 *Health care-associated infection (HCAI) prevention and control programs*	**2016 Capacity Level: 4**
P.3.4 *Antimicrobial stewardship activities*	**2016 Capacity Level: 3**

Summary of U.S. Self-Assessment

While there are federal and state-level capacities to detect antimicrobial resistant bacteria, many SLTT authorities have insufficient access to laboratories that can detect and characterize resistance according to published standards. The implementation of a One Health approach to surveillance and reporting of resistance requires alignment and coordination. Antimicrobial stewardship programs are being developed, although implemented inconsistently and not fully monitored.

2016 JEE Recommendations from the External Evaluators

1. Build an animal and human public health laboratory capacity to detect and characterize antimicrobial resistant pathogens to inform public health action.
2. Further enhance multisectoral and multidisciplinary coordination and collaboration, particularly the agricultural plant and environment sector including the EPA, and strengthen private-public partnerships.

3. Increase overall assessment and evaluation of antibiotic use in humans and animals.
4. Strengthen and document the effectiveness of AMR stewardship activities.

Summary of Actions Items

Efforts will focus on expanding capabilities at existing public health laboratories; characterizing and following trends in AMR, including the emergence of new bacterial strains and resistance mechanisms; fostering multisectoral and multidisciplinary collaboration, including through public-private partnerships; and strengthening antimicrobial stewardship activities. The action items align with the CARB a comprehensive national plan for the federal government developed through an interagency process that identifies critical actions necessary to combat the emergence and spread of antibiotic-resistant bacteria.

Action Items

Table 4. JEE RECOMMENDATION 1 (JEE INDICATORS P.3.1 and P.3.2): *Build an animal and human public health laboratory capacity to detect and characterize antimicrobial resistant pathogens to inform public health action.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DoD, HHS, USDA	Share resistance detection strategies and protocols among network partners. (CARB 2.1.1)	DoD, CDC, APHIS
2018	HHS	Develop an implementation plan for the Antibiotic Resistance Lab Network (AR Lab Network)[14] that considers all aspects of operation including specimen transport, testing, reporting, and data sharing. (CARB 2.1.1)	CDC
2018	HHS	Decrease by 50% the time required to detect and characterize drug-resistant enteric pathogens through National Antimicrobial Resistance Monitoring System (NARMS) surveillance, and communicate results to stakeholders.	CDC
2018	HHS	Improve the detection, investigation, and mitigation of multistate outbreaks caused by resistant enteric bacteria through a 25% reduction in time from the initial notification to NARMS to reporting of susceptibility testing results.	CDC
2018	HHS	Identify resistance patterns for Salmonella by analyzing near-real-time data from all Salmonella isolates sent to public health laboratories.	CDC

[14] The AR Lab Network is in charge of the rapid detection of outbreaks caused by drug-resistant pathogens, characterization of resistance mechanisms, tracking resistance trends, and identifying emerging forms of resistance.

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Conduct susceptibility testing on an increased proportion of Campylobacter isolates to help identify outbreaks and determine the sources of drug-resistant Campylobacter infections.	CDC
2018	USDA	Engage with the American Association of Veterinary Laboratory Diagnosticians (AAVLD) to develop a pilot project that creates a national-level surveillance stream with standardized antimicrobial susceptibility testing (AST) protocols for monitoring resistance in antibiotics of importance to both animal and human public health. (CARB 2.3.2)	APHIS
2018	USDA	Perform WGS and AST on all the FSIS, NARMS, and other regulatory isolates, and upload all data into the National Center for Biotechnology Information (NCBI).	FSIS
2018	USDA	Conduct real-time WGS on all ready-to-eat product isolates and all the isolates from foodborne investigation sample isolates (Salmonella, Shiga toxigenic Escherichia coli (STEC), Campylobacter and Listeria monocytogenes).	FSIS
2018	USDA	Expand AMR susceptibility-testing program on isolates derived from its Pathogen Reduction (PR)/ Hazard Analysis and Critical Control Point (HACCP) program and baseline programs, including pork and chicken parts.	FSIS
2018	USDA	Seek opportunities to collaborate with the USDA/APHIS Center of Epidemiology and Animal Health and the USDA/APHIS One Health Office to better understand the epidemiology of resistant bacteria from farm to table.	APHIS, FSIS
2019	HHS	Designate at least five public health laboratories as part of the AR Lab Network. (CARB 2.1.1)	CDC
2019	HHS	Assist Association of Public Health Laboratories (APHL), SLTT laboratories, and other partners to provide technical assistance and guidance to the AR Lab Network as needed. (CARB 2.1.1)	CDC
2019	HHS	Develop a partnership between NARMS and the National Healthcare Safety Network (NHSN) to obtain drug-resistance data from clinical laboratories on bacteria isolated from persons with invasive Salmonella, Campylobacter, or Shigella infections with completion in FY 2020.	CDC
2019	HHS	Develop a pilot project (to be implemented in FY 2020) to evaluate the association between antibiotic-resistant urinary tract infections and foodborne bacteria.	CDC
2019	USDA	Continue to perform WGS and AST on all the FSIS, NARMS, and other regulatory isolates, and upload all data into the NCBI.	FSIS

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	USDA	Continue to conduct real-time WGS on all ready-to-eat product isolates and all the isolates from foodborne investigation sample isolates (STEC, Campylobacter and Listeria monocytogenes).	FSIS
2019	USDA	Continue to expand AMR susceptibility-testing program on isolates derived from its PR/HACCP program and baseline programs, including pork and chicken parts.	FSIS
2019	USDA	Continue to seek opportunities to collaborate with the USDA/APHIS Center of Epidemiology and Animal Health and the USDA/APHIS One Health Office to better understand the epidemiology of resistant bacteria from farm to table.	APHIS, FSIS
2020	HHS	Integrate the five laboratories previously designated as part of the AR Lab Network into an AMR communications network that posts early warning alerts and reports urgent results and trends. (CARB 2.1.2)	CDC
2020	HHS	Implement the pilot project to evaluate the association between antibiotic-resistant urinary tract infections and foodborne bacteria.	CDC

Table 5. JEE RECOMMENDATION 2 (JEE INDICATORS P.3.1, P.3.2, and P.3.3): *Further enhance multisectoral and multidisciplinary coordination and collaboration, particularly the agricultural plant and environment sector including the EPA, and strengthen private-public partnerships.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	EPA	Test the ability to remove antibiotic resistant bacteria/genes in wastewater by various water treatment processes such as ultraviolet light emitting diodes and advanced oxidation.	EPA
2018	EPA, USDA	Identify microbial gene markers for AMR in wastewater effluents discharged into the environment and used for reuse purposes.	EPA, ARS
2018	HHS, USDA	Strengthen multisectoral coordination and collaboration through public-private partnerships and continued involvement in the Presidential Advisory Council on CARB (CARB) and CARB Task Force including basic research areas underpinning AMR in humans and animals. (CARB 4.2)	ASPR, NIH, ARS, NIFA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	EPA, HHS	Evaluate the risk of environmental uses of antibiotics on human health.[15] (CARB 2.4.3)	EPA, CDC, FDA
2019	HHS, USDA	Strengthen multisectoral coordination and collaboration through public-private partnerships and continued involvement in the Presidential Advisory Council CARB and the CARB Task Force, including basic research areas underpinning AMR in humans, animals, and the environment. (CARB 4.2)	NIH, ARS, NIFA
2020	HHS, USDA	Strengthen multisectoral coordination and collaboration through public-private partnerships and continued involvement in Presidential Advisory Council on CARB and CARB Task Force including basic research areas underpinning AMR in humans, animals, and the environment. (CARB 4.2)	NIH, ARS, NIFA

Table 6. JEE RECOMMENDATION 3 (JEE INDICATOR P.3.2): *Increase overall assessment and evaluation of antibiotic use in humans and animals.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DoD, HHS, VA	Define programmatic steps and resource-needs to support NHSN data submission by DoD and VHA facilities to ensure timely analysis of trends in antibiotic use and antibiotic resistance. (CARB 2.2.1)	DoD, CDC, VHA
2018	HHS	Submit a proposal for new measures for hospital reporting of data on antibiotic use to the National Quality Forum (NQF). (CARB 2.2.1)	CDC
2018	HHS	Begin the process of proposing new Inpatient Quality Reporting (IQR) rules following analysis and approval of the new NQF measures. (CARB 2.2.1)	CDC, CMS
2018	USDA	Implement on-farm data collection on antimicrobial use practices in various animal production settings. (CARB 2.4.3)	APHIS
2018	USDA	Include biological sampling for Salmonella, E. coli, and Enterococcus as part of the 2017-2018 National Animal Health Monitoring System beef cow-calf study. (CARB 2.4.4)	APHIS

[15] For antibiotic pesticides, resistant species in or on food, the skin of workers, or indirectly through the environment or clothing can spread resistance. EPA is not only addressing the development of resistance in the bacteria causing plant disease, but also in the potential for these agricultural uses to contribute to the development of antibiotic-resistant diseases in humans. While pathogens rarely share the same hosts, human pathogens and plant pathogens may exist concurrently, allowing for the potential for resistance to develop in human pathogens as a result of antibiotic use on crops. However, a quantified potential for any resistance traits to move from environmental bacteria into bacteria of human health concern has not been established.

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	USDA	Plan longitudinal studies of antimicrobial use (AMU) and AMR on swine grower/finisher and cattle feedlot operations for a period of up to five years starting in 2019.	APHIS
2019	HHS	Establish systems in at least 25 states, the District of Columbia, and Puerto Rico to measure the incidence of at least one regionally important multidrug-resistant organism (MDRO), provide health care facilities with feedback on local and regional MDRO rates, and provide health care facilities with technical assistance to advance MDRO prevention. (CARB 1.1.2)	CDC
2019	HHS	Expand user-support and validation programs to accommodate expected increases in hospital reporting through the NHSN AU/AR modules. (CARB 2.2.1)	CDC
2019	HHS	Establish up to 10 additional EIP sites, including sites in the West and Midwest that will monitor drug-resistant pathogens. Evaluate the contribution of data from those new sites to improved national analysis. (CARB 2.2.3)	CDC
2019	HHS	Initiate a study at EIP sites to evaluate populations at risk for carbapenem-resistant Enterobacteriaceae (CRE). (CARB 2.2.3)	CDC
2019	HHS	Validate molecular assays to support surveillance for drug-resistant gonorrhea at HHS/CDC research partners and EIP sites. (CARB 2.2.3)	CDC
2019	USDA	Continue to conduct longitudinal studies of AMU and AMR on swine grower/finisher and cattle feedlot operations for a period of up to five years starting in 2019.	APHIS
2020	HHS	Expand user-support and validation programs to accommodate expected increases in hospital reporting through the NHSN AU/AR modules. (CARB 2.2.1)	CDC
2020	HHS	Determine the need for additional reporting incentives among hospital consortia and state-based hospital networks in place of (or in addition to) HHS/CMS-required reporting. (CARB 2.2.1)	CDC, CMS
2020	HHS	Develop an electronic AU clinical-quality reporting measure for NHSN in a standard file format that hospitals can use to achieve the Stage 3 Meaningful Use objective and accelerate reporting. The timing of this activity will depend on the timeframe of the HHS/CMS Meaningful Use certification program. (CARB 2.2.2)	CDC, CMS
2020	HHS	Submit the measure to NQF for review and endorsement and to HHS/CMS for consideration as a reporting requirement of the HHS/CMS IQR following development of an electronic AU clinical-quality reporting measure for NHSN. (CARB 2.2.2)	CDC, CMS
2020	HHS	Expand EIP activities to include surveillance for additional urgent and serious antibiotic resistance threats. (CARB 2.2.3)	CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS	Develop a public health surveillance study with EIP investigators to explore the impact of bacterial populations within the human microbiome on attack rates of drug-resistant pathogens (e.g., Clostridium difficile, CRE, methicillin-resistant Staphylococcus aureus, Candida, Salmonella, Shigella, Campylobacter, and Streptococcus pneumoniae) with implementation completed in 2020. (CARB 2.2.3)	CDC
2020	HHS	Analyze the resistance of bacteria in the intestines of healthy people with a variety of diets, lifestyles, and antibiotic-use histories. (CARB 2.2.3)	CDC
2020	USDA	Continue to conduct longitudinal studies of AMU and AMR on swine grower/finisher and cattle feedlot operations for a period of up to five years starting in 2019.	APHIS

Table 7. JEE RECOMMENDATION 4 (JEE INDICATOR P.3.4): *Strengthen and document the effectiveness of AMR stewardship activities.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Support research to develop improved methods for combating antibiotic resistance and conducting antibiotic stewardship activities in multiple healthcare settings including ambulatory care, long-term care, and acute care. Support translation of findings into antibiotic-resistance prevention tools that can be implemented by healthcare providers. (CARB 1.1.4)	AHRQ
2018	HHS	Provide guidance on antibiotic stewardship to hospitals, long-term care facilities, and ambulatory care settings through AHRQ's Safety Program for Improving Antibiotic Use, as well as guidance to long-term care facilities through AHRQ's Nursing Home Antimicrobial Stewardship Guide posted on the AHRQ website (CARB 1.1.1A)	AHRQ
2018	HHS	Develop new diagnostic tools to inform appropriate treatment including tests that rapidly distinguish between viral and bacterial pathogens and detect antibiotic-resistance. (CARB 3.1)	NIH
2018	HHS	Support clinical trials to identify new treatment strategies to optimize and preserve the use of existing antibiotics for bacterial infections. (CARB 4.4)	NIH

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	USDA	Continue USDA's AMR global education and outreach efforts through two National Veterinary Accreditation Program (NVAP) modules: Use of Antibiotics in Animals and the Veterinary Feed Directive.	APHIS
2019	HHS	Support research to develop improved methods for combating antibiotic resistance and conducting antibiotic stewardship activities in multiple healthcare settings including ambulatory care, long-term care, and acute care. Support translation of findings into antibiotic-resistance prevention tools that can be implemented by healthcare providers. (CARB 1.1.4)	AHRQ
2019	HHS	Provide guidance on antibiotic stewardship to hospitals, long-term care facilities, and ambulatory care settings through AHRQ's Safety Program for Improving Antibiotic Use, as well as guidance to long-term care facilities through AHRQ's Nursing Home Antimicrobial Stewardship Guide posted on the AHRQ website. (CARB 1.1.1A)	AHRQ
2019	HHS	Ensure that state and large local health departments establish or enhance, through the HHS/CMS Quality Innovation Network, State AR Prevention (Protect) Programs for Healthcare to guide providers' antibiotic use and reduce transmission of resistant pathogens. (CARB 1.1.2)	CDC
2019	HHS	Issue guidance on antibiotic stewardship and best practices for ambulatory surgery centers, dialysis centers, nursing homes and other long-term care facilities, doctors' offices and other outpatient settings, pharmacies, emergency departments, and medical departments at correctional facilities. (CARB 1.1.1A)	CDC
2019	HHS	Propose expanded quality measures for antibiotic prescribing. (CARB 1.1.1B)	CDC
2019	HHS	Ensure that at least 25 States, the District of Columbia, and Puerto Rico establish or enhance antibiotic stewardship activities in inpatient health care delivery settings, in accordance with the HHS/CDC Core Elements, supported via the Protect Programs for Healthcare. (CARB 1.1.1A)	CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	HHS	Provide technical assistance to federal facilities (e.g., those operated by DoD, VA/VHA, and IHS) and other large health systems in scaling up implementation and assessment of interventions to improve outpatient antibiotic prescribing, extending effective interventions to long-term care settings, and ensuring long-term sustainability of antibiotic stewardship efforts. (CARB 1.1.1B)	CDC
2019	HHS	Expand training and support to acute care facilities and nursing homes to improve antibiotic stewardship as part of the Get Smart for Healthcare project. (CARB 1.1.1B)	CDC
2019	HHS	Provide annual national estimates of aggregated inpatient antibiotic use using data collected through the NHSN AU module along with feedback to health care facilities on antibiotic use, to indicate whether antibiotic use rates are above or below the national average. (CARB 2.1.3)	CDC
2019	HHS	Establish routine reporting of antibiotic use and resistance data from select hospital systems via the NHSN AU and AR modules. (CARB 2.1.3)	CDC
2019	HHS	Support clinical trials to identify new treatment strategies to optimize and preserve the use of existing antibiotics for bacterial infections. (CARB 4.4)	NIH
2019	HHS	Develop new diagnostic tools to inform appropriate treatment including tests that rapidly distinguish between viral and bacterial pathogens and detect antibiotic-resistance. (CARB 3.1)	NIH
2019	HHS, VA	Ensure that public health departments establish statewide programs to identify health care facilities with high antibiotic-prescribing rates and use lessons learned from the HHS/CDC and VA/VHA pilot project and other best practices to improve antibiotic prescribing in these facilities. (CARB 1.1.1B)	CDC, VHA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS	Support research to develop improved methods for combating antibiotic resistance and conducting antibiotic stewardship activities in multiple healthcare settings including ambulatory care, long-term care, and acute care. Support translation of findings into antibiotic-resistance prevention tools that can be implemented by healthcare providers. (CARB 1.1.4)	AHRQ
2020	HHS	Provide guidance on antibiotic stewardship to hospitals, long-term care facilities, and ambulatory care settings through AHRQ's Safety Program for Improving Antibiotic Use, as well as guidance to long-term care facilities through AHRQ's Nursing Home Antimicrobial Stewardship Guide posted on the AHRQ website. (CARB 1.1.1A)	AHRQ
2020	HHS	Initiate Protect Programs for Healthcare in 25 additional states, with all 50 states fully involved by the end of 2020. (CARB 1.1.2)	CDC
2020	HHS	Expand antibiotic use reporting and stewardship implementation among selected hospital systems. (CARB 1.1.1A)	CDC
2020	HHS	Assist nursing care organizations develop and implement stewardship programs and interventions. (CARB 1.1.1A)	CDC
2020	HHS	Ensure that an additional 25 states establish or enhance antibiotic stewardship activities in health care delivery settings, with all 50 states involved, by 2020. (CARB 1.1.1A)	CDC
2020	HHS	Evaluate the impact of quality measures on antibiotic use and provide feedback to health care partners, when sufficient data are available. (CARB 1.1.1B)	CDC
2020	HHS	Use data collected through the NHSN AU module, when sufficient data are available, to provide annual national estimates of aggregated inpatient antibiotic use and feedback to health care facilities on antibiotic use, indicating whether antibiotic use rates are above or below the national average. (CARB 2.1.3)	CDC
2020	HHS	Develop routine reporting of antibiotic use and resistance data via the NHSN AU and AR modules from among those hospital systems with aligned stewardship programs. (CARB 2.1.3)	CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS	Develop new diagnostic tools to inform appropriate treatment including tests that rapidly distinguish between viral and bacterial pathogens and detect antibiotic-resistance. (CARB 3.1)	NIH
2020	HHS	Support clinical trials to identify new treatment strategies to optimize and preserve the use of existing antibiotics for bacterial infections. (CARB 4.4)	NIH

PREVENT 4 — Zoonotic Disease

JEE Target

Adopted measured behaviors, policies, and/or practices that minimize the transmission of zoonotic diseases from animals into human populations.

Indicators

P.4.1 *Surveillance systems in place for priority zoonotic diseases/pathogens*	**2016 Capacity Level: 3**
P.4.2 *Veterinary or animal health workforce*	**2016 Capacity Level: 4**
P.4.3 *Mechanisms for responding to infectious zoonoses and potential zoonoses are established and functional*	**2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

Programs connecting human, animal, and environmental health exist (some of which are well coordinated for specific zoonoses). The overall federal approach to One Health currently remains informal. Surveillance and information systems across sectors are largely separate from one another. Departments and agencies involved in public health security need to formally share and align their priorities for zoonotic disease prevention, detection, and response.

2016 JEE Recommendations from the External Evaluators

1. Establish a national One Health approach that can formally delineate common goals, roles, and responsibilities for the various health and multidisciplinary sectors taking into account the steady state and emergency response.
2. Formalize interagency networks to address One Health issues through joint investigation, data sharing, communications, and funding of high priority projects and diseases using existing or new multidisciplinary tools.
3. Increase dedicated public health veterinarians to work on zoonotic diseases at the federal, state, and local levels.

Summary of Action Items

Efforts will focus on incorporating the One Health approach to addressing zoonotic diseases nationally and through collaboration across departments and agencies. The first priority is to create a shared vision and roadmap for a more formal approach to One

Health. Multiple federal departments and agencies will convene a multisectoral One Health Zoonotic Disease Prioritization workshop to: (a) prioritize the zoonotic diseases of greatest national concern for human, animal, and environmental health sectors that are responsible for federal zoonotic disease programs to address; and (b) develop plans for implementing and strengthening multisectoral approaches to address these diseases in the United States. This work will allow departments and agencies to develop jointly a list of necessary action items and next steps for strengthening One Health approaches to integrate surveillance systems, laboratory systems, joint outbreak response capacity, preparedness planning, and cross-sector prevention and control strategies.

Action Items

Table 8. JEE RECOMMENDATION 1 (JEE INDICATORS P.4.1 and P.4.3): *Establish a national One Health approach that can formally delineate common goals, roles, and responsibilities for the various health and multidisciplinary sectors taking into account the steady state and emergency response.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOI, HHS, USDA	Formalize the collaboration among key stakeholders for development of a strategy to enhance One Health approaches in the United States.	DOI, CDC, USDA
2018	DOI, HHS, USDA	Conduct a One Health Zoonotic Disease Prioritization Workshop using tools developed by HHS/CDC and USDA with facilitators from the human, animal, and environmental health sectors.	DOI, CDC, USDA
2018	DOI, HHS, USDA	Publish prioritized list of diseases and key outcomes resulting from the One Health Zoonotic Disease Prioritization Workshop including plans and next steps from departments and agencies responsible for federal zoonotic disease programs to jointly address the diseases using a multisectoral One Health approach.	DOI, CDC, USDA
2018	DOI, HHS, USDA	Draft a national framework for One Health.	DOI, CDC, USDA
2019	DOI, HHS, USDA	Finalize the national framework for One Health and disseminate it to federal government partners.	DOI, CDC, USDA
2019	DOI, HHS, USDA	Begin implementing the national framework for One Health in collaboration with federal government partners.	DOI, CDC, USDA
2020	DOI, HHS, USDA	Continue implementing the national framework for One Health in collaboration with federal government partners.	DOI, CDC, USDA

Table 9. JEE RECOMMENDATION 2 (JEE INDICATORS P.4.1 and P.4.3): *Formalize interagency networks to address One Health issues through joint investigation, data sharing, communications, and funding of high priority projects and diseases using existing or new multidisciplinary tools.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOI, HHS, USDA	Use the outcomes from the One Health Zoonotic Disease Prioritization Workshop to develop a priority list of actions for individual departments and agencies and the interagency teams.	DOI, CDC, USDA
2018	DOI, HHS, USDA	Identify and launch up to three specific One Health implementation projects for the priority zoonoses.	DOI, CDC, USDA
2019	DOI, HHS, USDA	Identify and launch up to three additional One Health implementation projects identified during the One Health Zoonotic Disease Prioritization Workshop.	DOI, CDC, USDA
2020	DOI, HHS, USDA	Identify successes and challenges to strengthen future One Health projects building on 2018 and 2019 implementation projects.	DOI, CDC, USDA

Table 10. JEE RECOMMENDATION 3 (JEE INDICATOR P.4.2): *Increase dedicated public health veterinarians to work on zoonotic diseases at the national, state, and local levels.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOI, HHS, USDA	Identify existing training programs for veterinarians and animal health professionals in the federal government.	DOI, CDC, USDA
2018	DOI, HHS, USDA	Conduct a field epidemiology course (co-presented by HHS/CDC and USDA) for federal veterinary epidemiologists.	DOI, CDC, USDA
2018	DOI, HHS, USDA	Conduct additional One Health courses for a multisectoral audience.	DOI, CDC, USDA
2018	USDA	Identify state veterinarians who have not had training in transboundary and emerging diseases and One Health concepts and methods for multi-sector response.	USDA
2019	HHS	Increase the number of veterinarians trained in public health and applied epidemiology through existing programs such as the CDC-Hubert Global Health Fellowship, Epidemiology Elective Program for Senior Veterinary and Medical Students, HHS/CDC's Epidemic Intelligence Service, and others.	CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	HHS	Identify additional opportunities to integrate One Health training among relevant departments and agencies.	CDC
2019	HHS, USDA	Work with governmental and non-governmental partners to identify and integrate One Health core competencies into technical- and sector-specific trainings.	CDC, USDA
2019	USDA	Identify additional opportunities to integrate One Health training into USDA programs such as AgDiscovery, the Saul T. Wilson scholars program, and others.	USDA
2019	USDA	Recruit and select a current USDA employee for sponsored training in the HHS/CDC's Epidemic Intelligence Service.	USDA
2019	USDA	Conduct a tabletop exercise, developed and led by the Veterinary Services Training and Exercise Program, for a team of state and federal animal and public health officials to manage response activities and infection risk for responders during a zoonotic disease outbreak. Courses: One Health Collaboration Methods and One Health: Applied Critical Thinking focused on Zoonotic Disease Outbreaks.	USDA
2019	USDA	Review evaluation data from joint training and exercises hosted by HHS/CDC and USDA/APHIS to strengthen future delivery of training events, as outlined in the Veterinary Services (VS) National Training and Exercise Program, ensuring that the training involves state counterparts.	APHIS

Table 11. OTHER ACTIVITIES (JEE INDICATORS P.4.1 and P.4.3)

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOI, HHS, USDA	Support federal and non-federal institutions and investigators in efforts to apply surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface and perform research to enhance understanding of the molecular, ecological, and/or environmental factors that influence pathogenesis, transmission, and evaluation of emerging and re-emerging pathogens.	USGS, CDC, NIH, APHIS, ARS, NIFA
2018	DOI, HHS, USDA	Support the global One Health Tripartite and other global human and animal health partners representing WHO, FAO, and OIE to advance the prevention, detection, and response to zoonotic diseases and related health threats.	USGS, CDC, USDA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOI, HHS, USDA	Support the OIE by leading multiple OIE Collaborating Centres and Reference Laboratories.	USGS, CDC, APHIS, ARS
2018	HHS	Continue to support the Zoonoses and One Health Updates (ZOHU) Call for a U.S. audience to provide timely updates and continuing education on issues covering zoonoses and One Health topics.	CDC
2018	HHS	Support federal and non-federal institutions and investigators in efforts to characterize zoonotic pathogens to better understand replication and transmission in zoonotic reservoirs.	NIH
2018	HHS, USDA	Support the FAO by leading multiple Reference Centres for zoonoses.	CDC, APHIS
2018	USDA	Continue to support OIE's One Health objectives, including the timely reporting of all OIE-listed diseases through the National Animal Health Reporting System (NAHRS).	APHIS
2018	USDA	Continue to serve, through the National Veterinary Services Laboratories (NVSL) and the Center for Veterinary Biologics (CVB), as an OIE Collaborating Center for the Diagnosis of Animal Diseases and Vaccine Evaluation in the Americas.	APHIS
2018	USDA	Continue to serve, through NVSL, as an OIE reference laboratory for the following animal diseases: avian influenza; anthrax; bluetongue; contagious equine metritis; Eastern, Western, and Venezuelan encephalomyelitis; equine infectious anemia; foot-and-mouth disease; leptospirosis; Newcastle disease; pseudorabies; swine influenza; vesicular stomatitis; and West Nile fever.	APHIS
2018	USDA	Continue to serve, through NVSL, as a FAO Reference Center for animal influenza, Newcastle disease, bovine tuberculosis, and paratuberculosis.	APHIS
2019	DOI, HHS, USDA	Continue to support federal and non-federal institutions and investigators in efforts to apply surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface and perform research to enhance understanding of the molecular, ecological, and/or environmental factors that influence pathogenesis, transmission, and evaluation of emerging and re-emerging pathogens.	USGS, CDC, NIH, APHIS, ARS, NIFA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	DOI, HHS, USDA	Continue to support the global One Health Tripartite and other global human and animal health partners representing WHO, FAO, and OIE to advance the prevention, detection, and response to zoonotic diseases and related health threats.	USGS, CDC, USDA
2019	DOI, HHS, USDA	Continue to support the OIE, by leading multiple OIE Collaborating Centres and Reference Laboratories.	USGS, CDC, APHIS, ARS
2019	HHS	Continue to support the Zoonoses and One Health Updates (ZOHU) Call for a U.S. audience to provide timely updates and continuing education on issues covering zoonoses and One Health topics.	CDC
2019	HHS	Continue to support federal and non-federal institutions and investigators in efforts to characterize zoonotic pathogens to better understand replication and transmission in zoonotic reservoirs.	NIH
2019	HHS, USDA	Continue to support the FAO by leading multiple Reference Centres for zoonoses.	CDC, APHIS
2019	USDA	Continue to support the OIE's One Health objectives, including the timely reporting of all OIE-listed diseases through the NAHRS.	APHIS
2020	DOI, HHS, USDA	Continue to support federal and non-federal institutions and investigators in efforts to apply surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface and perform research to enhance understanding of the molecular, ecological, and/or environmental factors that influence pathogenesis, transmission, and evaluation of emerging and re-emerging pathogens.	USGS, CDC, NIH, APHIS, ARS, NIFA
2020	DOI, HHS, USDA	Continue to support the global One Health Tripartite and other global human and animal health partners representing WHO, FAO, and OIE to advance the prevention, detection, and response to zoonotic diseases and related health threats.	USGS, CDC, USDA
2020	DOI, HHS, USDA	Continue to support the OIE, by leading multiple OIE Collaborating Centres and Reference Laboratories.	USGS, CDC, APHIS, ARS
2020	HHS	Continue to support the Zoonoses and One Health Updates (ZOHU) Call for a U.S. audience to provide timely updates and continuing education on issues covering zoonoses and One Health topics.	CDC
2020	HHS	Continue to support federal and non-federal institutions and investigators in efforts to characterize zoonotic pathogens to better understand replication and transmission in zoonotic reservoirs.	NIH

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS, USDA	Continue to support the FAO by leading multiple Reference Centres for zoonoses.	CDC, APHIS
2020	USDA	Continue to support the OIE's One Health objectives, including the timely reporting of all OIE-listed diseases through the NAHRS.	APHIS

PREVENT 5 — Food Safety

JEE Target

States Parties should have surveillance and response capacity for food and waterborne disease risk or events. It requires effective communication and collaboration among the sectors responsible for food safety and safe water and sanitation.

Indicator

P.5.1 *Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination* **2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

Food safety programs are largely effective, but there are still challenges in detecting multistate outbreaks with lack of access to specialized laboratories at all local levels.

2016 JEE Recommendations from the External Evaluators

1. Continue to develop new epidemiological and environmental tools to enhance foodborne illness outbreak investigations.
2. Continue to develop next generation laboratory methods such as WGS for pathogen identification.
3. Reinforce the coordination and support for state and local governments by conducting more clinical, food and environmental testing and isolation characterization.

Summary of Actions Items

Efforts focus on enhancing detection and reporting of foodborne illness outbreaks and progressively developing additional, state-of-the-art laboratory testing capabilities in state and local public health laboratories. These include next-generation WGS and related technologies, methods and platforms, and advanced computational and bioinformatic tools for enhanced pathogen identification.

Action Items

Table 12. JEE RECOMMENDATION 1 (JEE INDICATOR P.5.1): *Continue to develop new epidemiological and environmental tools to enhance foodborne illness outbreak investigations.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Enhance current System for Enteric Disease Response, Investigation, and Coordination capabilities to allow integration of new data sources (e.g., AMR data for bacteria isolated from food) and improve functionality (e.g., build an embedded outbreak detection algorithm).	CDC
2018	HHS	Continue to expand the National Environmental Assessment Reporting System (NEARS), in which 26 sites are participating as of 2017.	CDC
2018	HHS	Expand the Environmental Assessment Training Series (EATS) from one module to three modules.	CDC
2019	HHS	Update the NEARS Instruction Manual.	CDC
2019	HHS	Change the exercises in EATS.	CDC
2019	HHS	Merge NEARS and National Outbreak Reporting System into one system.	CDC
2020	HHS	Sequence and analyze more than 80% of all clinical Salmonella, STEC, and Listeria isolates received in state public health laboratories using core genome/whole genome Multilocus Sequence Typing (MLST) and AMR prediction in the United States.	CDC

Table 13. JEE RECOMMENDATION 2 (JEE INDICATOR P.5.1): *Continue to develop next generation laboratory methods such as WGS for pathogen identification*.

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Ensure that public health laboratory sequencing capability exists in 95% of states in the United States.	CDC
2018	HHS	Certify 70% of state public health laboratories for WGS in PulseNet.	CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Provide the public health community with capabilities in next-generation WGS and related technologies, methods and platforms, and advanced computational and bioinformatic tools for enhanced pathogen identification and for informing development of MCMs and subsequent technologies.	NIH
2018	USDA	Ensure that all pathogens recovered from USDA/FSIS sampling program are sequenced and uploaded to PulseNet and National Center for Biotechnology Information (NCBI) Pathogen Detector, including at least 60% of microbial indicators tested by USDA/FSIS.	FSIS
2019	HHS	Ensure that all 50 states have sequencing capacity in their public health laboratories.	CDC
2019	HHS	Certify 95% of state public health laboratories for WGS in PulseNet.	CDC
2019	HHS	Continue to provide the public health community with capabilities in next-generation WGS and related technologies, methods and platforms, and advanced computational and bioinformatic tools for enhanced pathogen identification and for informing development of MCMs and subsequent technologies.	NIH
2019	USDA	Ensure that all pathogens recovered from USDA/FSIS sampling program are sequenced and uploaded to PulseNet and NCBI Pathogen Detector including at least 60% of microbial indicators tested by USDA/FSIS as well as isolates from other USDA/AMS and state inspection programs.	FSIS
2020	HHS	Sequence and analyze more than 80% of all clinical Salmonella, Shiga toxin producing E. coli, and Listeria isolates received in the state public health laboratories using core genome/whole genome MLST and AMR prediction in the United States.	CDC
2020	HHS	Continue to provide the public health community with capabilities in next-generation WGS and related technologies, methods and platforms, and advanced computational and bioinformatic tools for enhanced pathogen identification and for informing development of MCMs and subsequent technologies.	NIH
2020	USDA	Ensure that all pathogens recovered from USDA/FSIS sampling program are sequenced and uploaded to PulseNet and NCBI Pathogen Detector including at least 60% of microbial indicators tested by USDA/FSIS as well as isolates from other USDA/AMS and state inspection programs.	FSIS

Table 14. JEE RECOMMENDATION 3 (JEE INDICATOR P.5.1): *Reinforce the coordination and support for state and local governments by conducting more clinical, food and environmental testing and isolation characterization.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Ensure that public health laboratory sequencing capability exists in 95% of states in the United States.	CDC
2018	HHS	Certify 70% of state public health laboratories for WGS in PulseNet.	CDC
2018	USDA	Conduct surveillance in 19 states on FSIS-regulated commodities, where target effort is 5000 samples tested.	FSIS
2018	USDA	Develop or validate three methods of detecting select/threat agents in food.	FSIS
2018	USDA	Conduct at least one exercise to document capability and capacity to respond to emergencies caused by specific agents.	FSIS
2019	HHS	Ensure that all 50 states have sequencing capacity in their public health laboratories.	CDC
2019	HHS	Certify 95% of state public health laboratories for WGS in PulseNet.	CDC
2019	USDA	Conduct characterization including AST and WGS on 100% of USDA/FSIS regulated pathogens, all Salmonella and Campylobacter from cecal NARMS program, isolates submitted by the USDA/AMS National School Lunch Program and states on behalf of the MPI program, and at least 60% of microbial indicators.	FSIS
2020	HHS	Sequence and analyze more than 80% of all clinical Salmonella, SEC, and Listeria isolates received in the state public health laboratories using core genome/whole genome MLST and AMR prediction in the United States.	CDC
2020	USDA	Conduct characterization including AST and WGS on 100% of USDA/FSIS regulated pathogens, all Salmonella and Campylobacter from NARMS Cecal Sampling Program, isolates submitted by the USDA/AMS National School Lunch Program and states on behalf of the MPI program, and at least 90% of microbial indicators.	FSIS

Table 15. OTHER ACTIVITIES (JEE INDICATOR P.5.1)

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	USDA	Add isolates from newly developed programs to WGS characterization, including Siluriformes sampling.	FSIS
2019	USDA	Add more isolates to WGS characterization from newer programs such as the “other parts” category for chicken products (e.g., necks, hearts, livers, gizzards) and high-risk products from beef sources (e.g., cheek, head meat, and weasand).	FSIS
2019	USDA	Add more isolates to WGS characterization from newer programs including minor species such as sheep, goat, and ratites.	FSIS
2019	USDA	Conduct characterization including AST and WGS on 100% of FSIS regulated pathogens submitted by the AMS School Lunch Program and from states on behalf of the MPI Program.	FSIS
2020	USDA	Conduct characterization including AST and WGS on 100% of FSIS regulated pathogens submitted by the AMS School Lunch Program and from states on behalf of the MPI Program.	FSIS

PREVENT 6 — Biosafety and Biosecurity

JEE Target

A whole-of-government national biosafety and biosecurity system is in place, ensuring that especially dangerous pathogens are identified, held, secured, and monitored in a minimal number of facilities according to best practices; biological risk management training and educational outreach are conducted to promote a shared culture of responsibility, reduce dual use risks, mitigate biological proliferation and deliberate use threats, and ensure safe transfer of biological agents; and, country-specific biosafety and biosecurity legislation, laboratory licensing, and pathogen control measures are in place, as appropriate.

Indicators

P.6.1 *Whole-of-government biosafety and biosecurity system is in place for human, animal, and agriculture facilities*	**2016 Capacity Level: 4**
P.6.2 *Biosafety and biosecurity training and practices*	**2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

Overall, systems for biosafety and biosecurity are strong, yet there are still areas for improvement with respect to federal oversight and training availability.

2016 JEE Recommendations from the External Evaluators

1. Continue to implement recommendations by the FESAP and Fast Track Action Committee on Select Agent Regulations (FTAC-SAR).
2. Enhance partnerships with the biomedical industry and scientific community to comprehensively evaluate gain-of-function research and develop federal policies and guidelines.
3. Finalize and implement recommendations on gain-of-function studies involving pathogens with pandemic potential.

Summary of Actions Items

The focus will be on implementing two sets of recommendations, one from the FESAP, which conducted an internal federal government review of biosafety and biosecurity practices, and another from the FTAC-SAR, which conducted an external review that

focused on the effects of the select agent regulations on researchers and laboratories. The recommendations made by both the FESAP and FTAC-SAR address the culture of responsibility, oversight, outreach, and education; applied biosafety research; incident reporting; material accountability; inspection processes; regulatory changes; and guidance to improve biosafety and biosecurity. Implementation of the FESAP and FTAC-SAR recommended actions is anticipated to strengthen biosafety and biosecurity practices and oversight activities. The United States is committed to fostering progress in the life sciences including peaceful research involving BSAT and non-BSAT, while at the same time ensuring that such work is being conducted in a safe and secure manner. The United States will also continue to implement policies regarding dual use research of concern.

Action Items

Table 16. JEE RECOMMENDATION 1 (JEE INDICATORS P.6.1 and P.6.2): *Continue to implement recommendations by FESAP and FTAC-SAR.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	Multiple	Implement regulatory changes, develop guidance, and expand outreach to improve biosafety and biosecurity (subject to availability of funds).	ASPR
2019	Multiple	Implement measures to optimize biosafety and biosecurity including actions to address the culture of responsibility, oversight, applied biosafety research, incident reporting, material accountability, and inspection processes, and continue to expand outreach and education (subject to availability of funds).	ASPR
2020	Multiple	Complete implementation of the FESAP and FTAC-SAR recommendations to address the culture of responsibility, oversight, outreach, and education; applied biosafety research; incident reporting; material accountability; inspection processes; and regulatory changes and guidance to improve biosafety and biosecurity (subject to availability of funds).	ASPR

Table 17. JEE RECOMMENDATION 2 (JEE INDICATOR P.6.2): *Enhance partnerships with the biomedical industry and scientific community to comprehensively evaluate gain-of-function research and develop federal policies and guidelines.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Engage with stakeholders implementing the United States Government Policy for Institutional Oversight of Life Sciences Dual Use Research of Concern (DURC)[16] to educate stakeholders; collect feedback about resources needed to effectively implement the policy; and discuss stakeholder experiences, challenges, and innovative practices.	NIH
2019	HHS	Continue to engage with stakeholders regarding DURC and any policies or procedures regarding work involving the creation, transfer, or use of enhanced potential pandemic pathogens (PPP).	NIH
2020	Multiple	Engage stakeholders to assess the impact that review mechanisms adopted pursuant to the *Recommended Policy Guidance for Departmental Development of Review Mechanism for Potential Pandemic Pathogen Care and Oversight* (P3CO) policy guidance have on work involving the creation, transfer, or use of enhanced PPPs; and provide transparency, public engagement, and continued dialogue about enhanced PPP research.	ASPR

Table 18. JEE RECOMMENDATION 3 (JEE INDICATOR P.6.2): *Finalize and implement recommendations on gain-of-function studies involving pathogens with pandemic potential.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	Multiple	Continue to implement federal government policies for the oversight of DURC.	ASPR
2018	Multiple	Implement standardized review procedures for multi-leveled and multidisciplinary reviews of research anticipated to create, transfer, and/or use enhanced PPP or gain-of-function research of concern.	ASPR
2019	HHS	Develop public outreach and education programs to communicate updated information on DURC and gain-of-function research of concern regarding PPP.	ASPR

[16] S3: Science Safety Security, "United States Government Policy for Institutional Oversight of Life Sciences Dual Use Research of Concern" (last reviewed: November 13, 2015).

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	Multiple	Consider findings from stakeholder engagement about multidisciplinary reviews of research anticipated to create, transfer, or use enhanced PPP or gain-of-function research of concern and coordinate a process to assess the impact of implementation of the P3CO policy guidance on research programs and institutions that considers how to provide transparency, public engagement, and continued dialogue about enhanced PPP research.	Multiple

Table 19. OTHER ACTIVITIES (JEE INDICATOR P.6.2)

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	EPA	Establish the EPA Biosafety and Biosecurity Advisory Board to provide oversight of DURC, compliance with select agent regulations, and measures to enhance a culture of responsibility in life sciences research.	EPA
2018	EPA	Implement an EPA biosafety and biosecurity training program for life sciences researchers. (EPA)	EPA
2018	HHS	Develop a compendium of freely available biosafety and biosecurity training programs and other resources.	CDC
2018	HHS	Sponsor the 15th CDC International Biosafety Symposium to promote biosafety best practices, with a specific emphasis in 2018 on One Health, to enhance the understanding of laboratory biosafety practitioners of the One Health approach.	CDC
2018	HHS	Continue to support and refine the National Biosafety and Biocontainment Training Program to expand the pool of highly trained biosafety professionals to staff key positions and roles.	NIH
2018	Multiple	Continue to engage with stakeholders to enhance the culture of biosafety, biosecurity, and responsible conduct in the life sciences and sharing of best practices.	Multiple
2018	Multiple Departments	Continue to update the “S3: Science, Safety, Security” website to further biorisk management education across a range of stakeholders, promoting communication, transparency, and awareness about biosafety, biocontainment, and biosecurity issues and activities in laboratories. (HHS/ASPR to maintain website; multiple federal departments and agencies to contribute content).	ASPR

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	Multiple Departments	Develop a draft *Biosafety in Microbiological and Biomedical Laboratories*, 6th edition.	ASPR, CDC, NIH
2018	USDA	Assemble a steering committee to plan the scientific program for the USDA ARS 5th International Biosafety and Biocontainment symposium series in 2019 to promote the principles and practices of biosafety, biocontainment, and biosecurity focused on agricultural research, both in the controlled laboratory environment and field research and response applications.	ARS
2019	HHS	Continue development of a draft *Biosafety in Microbiological and Biomedical Laboratories*, 6th edition.	ASPR, CDC, NIH
2019	HHS	Increase entity involvement for the National Biosafety and Biocontainment Training Program fellowship developmental assignments to diversify training and practical knowledge learning experiences.	NIH
2019	Multiple Departments	Continue to update the "S3: Science, Safety, Security" website to further biorisk management education across a range of stakeholders, promoting communication, transparency, and awareness about biosafety, biocontainment, and biosecurity issues and activities in laboratories. (HHS/ASPR to maintain website; multiple federal departments and agencies to contribute content).	ASPR
2019	USDA	Hold the USDA ARS 5th International Biosafety and Biocontainment symposium series to promote the principles and practices of biosafety, biocontainment, and biosecurity focused on agricultural research, both in the controlled laboratory environment and field research and response applications.	ARS
2020	HHS	Release *Biosafety in Microbiological and Biomedical Laboratories*, 6th edition.	CDC, NIH
2020	HHS	Expand training courses and opportunities for learning for biosafety professionals outside of the National Biosafety and Biocontainment Training Program fellowship.	NIH
2020	Multiple Departments	Continue to update the "S3: Science, Safety, Security" website to further biorisk management education across a range of stakeholders, promoting communication, transparency, and awareness about biosafety, biocontainment, and biosecurity issues and activities in laboratories. (HHS/ASPR to maintain website; multiple federal departments and agencies to contribute content).	ASPR

PREVENT 7 — Immunization

JEE Target

A functioning national vaccine delivery system—with nationwide reach, effective distributions, access for marginalized populations, adequate cold chain, and ongoing quality control—that is able to respond to new disease threats.

Indicators

P.7.1 *Vaccine coverage (measles) as part of the national program* **2016 Capacity Level: 5**

P.7.2 *National vaccine access and delivery* **2016 Capacity Level: 5**

Summary of U.S. Self-Assessment

The United States has successfully reached the global vaccination goal for measles and maintains a strong supply system for vaccines. However, vaccination rates among individual states vary for complex reasons and reaching vaccination goals for all jurisdictions requires additional efforts.

2016 JEE Recommendations from the External Evaluators

1. Improve vaccination coverage for the adult population.
2. Increase interoperability between state-based immunization information systems and provider level electronic health records.
3. Reduce disparities in vaccinations by increasing coverage among subpopulations.

Summary of Action Items

Efforts will focus on improving interoperability between state-based immunization information systems and reducing disparities in vaccinations. Coordination between HHS/CDC and HHS/CMS will leverage the existing networks of Medicaid providers to improve vaccination coverage in states and localities where rates continue to be persistently below the national targets. New standards for existing awards for state and local immunization programs will also help to increase access to and uptake of vaccines, which will be measured using the existing methods. Efforts include providing federal funds and technical assistance to state and local immunization programs to help address gaps in subpopulations at SLTT levels.

Action Items

JEE RECOMMENDATION 1 (JEE INDICATOR P.7.2): *Improve vaccination coverage for the adult population.*

NOTE: *HHS/CDC and HHS/OASH/NVPO currently use the U.S. National Adult Immunization Plan[17] to facilitate coordinated action by federal and non-federal partners to protect public health and achieve optimal prevention of infectious diseases and their consequences through the vaccination of adults. HHS uses the U.S. Healthy People objectives for adult immunization (IID-12, 13, 14, 15)[18] to monitor progress towards improving vaccination coverage in this population, which adequately addresses this recommendation.*

Table 20. JEE RECOMMENDATION 2 (JEE INDICATOR P.7.2): *Increase interoperability between state-based immunization information systems and provider level electronic health records.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Measure state progress in meeting Immunization Information Systems (IIS) functional standards using the IIS Annual Report (IISAR) and through the American Immunization Registry Association assessment and certification efforts. (IISAR results for 2017 will be available during the fall of 2018).	CDC
2019	HHS	Measure state progress in meeting IIS functional standards using the IISAR and through the American Immunization Registry Association assessment and certification efforts. (IISAR results for 2018 will be available during the fall of 2019).	CDC
2020	HHS	Measure state progress in meeting IIS functional standards using the IISAR and through the American Immunization Registry Association assessment and certification efforts. (IISAR results for 2019 will be available during the fall of 2020).	CDC

[17] *See* HHS. "Adult Immunization Plans."
[18] *See* Office of Disease Prevention and Health Promotion (ODPHP). "Immunization and Infectious Diseases."

Table 21. JEE RECOMMENDATION 3 (JEE INDICATOR P.7.2): *Reduce disparities in vaccinations by increasing coverage among subpopulations.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Continue providing federal funds and technical assistance to state and local immunization programs to implement strategies to reduce disparities in vaccination coverage in their jurisdictions.	CDC
2018	HHS	Facilitate open communications with state Medicaid programs and identify and share best practices to increase immunization.	CDC
2018	HHS	Continue to measure national and local area estimates of vaccination coverage of children 19-35 months using the 2017 National Immunization Survey; estimates will be available during the fall of 2018.	CDC
2019	HHS	Continue providing federal funds and technical assistance to state and local immunization programs for immunization operations. A new five-year cooperative agreement will be awarded in 2019 that includes identifying disparities in the awardees' jurisdictions and implementing strategies to reduce them.	CDC
2019	HHS	Continue to facilitate communications related to immunization priorities among Medicaid programs.	CDC
2019	HHS	Continue to measure national and local area estimates of vaccination coverage of children 19-35 months using the 2018 National Immunization Survey; estimates will be available during the fall of 2019.	CDC
2020	HHS	Continue providing federal funds and technical assistance to state and local immunization programs to implement strategies to reduce disparities in vaccination coverage in their jurisdictions.	CDC
2020	HHS	Continue to facilitate communications related to immunization priorities among Medicaid programs.	CDC
2020	HHS	Continue to measure national and local area estimates of vaccination coverage of children 19-35 months using the 2019 National Immunization Survey; estimates will be available during the fall of 2020.	CDC

DETECT 1 — National Laboratory System

JEE Target

Real-time biosurveillance with a national laboratory system and effective modern point-of-care and laboratory-based diagnostics.

Indicators

D.1.1 *Laboratory testing for detection of priority diseases*	**2016 Capacity Level: 5**
D.1.2 *Specimen referral and transport system*	**2016 Capacity Level: 4**
D.1.3 *Effective modern point-of-care and laboratory-based diagnostics*	**2016 Capacity Level: 5**
D.1.4 *Laboratory quality system*	**2016 Capacity Level: 5**

Summary of U.S. Self-Assessment

The United States has an extensive and high-quality public health laboratory system. However, capacities for surge testing and bioinformatics are limited in many places.

2016 JEE Recommendations from the External Evaluators

1. Institutionalize partnerships among collaborating federal agencies by jointly developing policies and programs to strengthen laboratory networks across health sectors and between federal and state laboratories. These will be in the areas of financing, harmonizing laboratory protocols, reporting chains, laboratory information systems, sample sharing, role of laboratory support in surveillance for outbreaks and emerging trends, and data sharing and confidentiality.
2. Develop an inventory of vulnerabilities in capacity and capability for all health sectors at the state level to improve testing service with surge requirements for a concerted whole-of-government plan.
3. Continue to enhance capabilities of all health sectors for emerging disease detection including strengthening and assuring bioinformatics to inform future metagenomic technologies, the use of culture-independent diagnostic tests for patient care; and, digitizing records in the human and veterinary laboratory networks to support real-time surveillance.
4. Explore the appropriate protocols for rapid and safe sample sharing in anticipation of or during a public health emergency.

5. Continue to engage in various global laboratory networks including sharing resources, experiences, data, and biological samples taking into consideration the global benefits.

Summary of Action Items

Building on existing frameworks and laboratory programs, efforts will include continuing to evaluate the roadblocks to effective laboratory response during emergencies, strengthening laboratory networks, growing capabilities in state and local public health laboratories, and facilitating the acquisition and transportation of biological samples that are critical for MCM development for novel pathogens.

Action Items

Table 22. JEE RECOMMENDATION 1 (JEE INDICATORS D.1.1 and D.1.2): *Institutionalize partnerships among collaborating federal agencies by jointly developing policies and programs to strengthen laboratory networks across health sectors and between federal and state laboratories. These will be in the areas of financing, harmonizing laboratory protocols, reporting chains, laboratory information systems, sample sharing, role of laboratory support in surveillance for outbreaks and emerging trends, and data sharing and confidentiality.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Finalize the "USG Framework for the Rapid Sharing of Biological Material Related to Non-influenza Pathogens with the Potential to Cause a Public Health Emergency of International Concern" (federal government Sample Sharing Framework) which provides a consensus-driven process for federal government departments and agencies to jointly identify, obtain, and coordinate national and/or international distribution of samples for preparedness and response purposes.	ASPR
2018	HHS	Hold a Lab Preparedness Summit to share best practices focusing on the Laboratory Response Network.	CDC
2018	HHS	Participate in a functional exercise with relevant state and federal stakeholders that includes the National Animal Health Laboratory Network to identify potential gaps or challenges when responding to a national-level emergency.	APHIS
2018	HHS	Continue to support the Integrated Consortium of Laboratory Networks (ICLN) for coordinating federally sponsored analytical laboratory services for chemical, biological, radiological, and nuclear incidents.	USDA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	HHS	Conduct national/international tabletop exercises with relevant stakeholders to test the federal government Sample Sharing Framework and identify additional challenges.	ASPR, CDC

Table 23. JEE RECOMMENDATION 2 (JEE INDICATOR D.1.1): *Develop an inventory of vulnerabilities in capacity and capability for all health sectors at the state level to improve testing service with surge requirements for a concerted whole-of-government plan; and.***JEE RECOMMENDATION 3 (JEE INDICATOR D.1.3):** *Continue to enhance capabilities of all health sectors for emerging disease detection including strengthening and assuring bioinformatics to inform future metagenomic technologies, the use of culture-independent diagnostic tests for patient care; and, digitizing records in the human and veterinary laboratory networks to support real-time surveillance.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DoD, HHS	Hold biannual consultations among HHS/CDC, HHS/FDA, HHS/CMS, HHS/ASPR, DoD, and APHL on approval and distribution of diagnostic tests and reagents during emergency responses to improve process flows for: (a) Emergency Use Authorizations and laboratory developed tests, and (b) clinical specimens received for diagnostic testing, reporting, quality, biosafety, and interpretation.	DoD, ASPR, CDC, CMS, FDA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Use the CDC Epidemiology and Laboratory Capacity for Infectious Diseases Cooperative Agreement mechanism to address high priority needs that are not disease-specific to: ▪ Build and maintain an effective public health workforce for rapid response to infectious disease outbreaks. • Ensure health departments are well equipped with staff, surveillance systems, and other tools to identify, characterize, and provide rapid, effective, and flexible response to infectious disease threats. ▪ Strengthen cross-cutting national surveillance systems. • Develop, execute, and evaluate public health interventions to promote early detection methods that will facilitate the timely implementation of control measures and minimize transmission of infectious diseases. ▪ Boost laboratory infrastructure with the latest diagnostic technologies. • Develop modern and well-equipped public health laboratories, with well-trained staff, employing high quality laboratory processes and systems that foster communication and appropriate integration between laboratory and epidemiology functions. ▪ Improve health information systems to efficiently transmit, receive, and analyze infectious disease-related data electronically. • Develop and enhance health information systems infrastructure in public health agencies including public health laboratories, focusing on standards-based electronic data exchange, information systems interoperability, and enhancing and sustaining integrated surveillance information systems. • Enhance the electronic exchange of data between public health agencies and clinical care entities, focusing on electronic laboratory reporting and electronic case reporting (eCR). ▪ Increase informatics/information technology (IT) capacity in public health agencies through staff, contracts, and training.	CDC
2018	HHS	Provide the public health community with capabilities in next-generation WGS and related technologies, methods and platforms, and advanced computational and bioinformatic tools for enhanced pathogen identification and to inform development of MCMs and subsequent technologies.	CDC, NIH

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Engage with AAVLD and National Animal Health Laboratory Network laboratories to develop standardized electronic messaging of AST data to support monitoring national-level AMR in real-time. (CARB 2.3.2)	APHIS
2019	HHS	Continue to provide the public health community with capabilities in next-generation WGS and related technologies, methods and platforms, and advanced computational and bioinformatic tools for enhanced pathogen identification and to inform development of MCMs and subsequent technologies.	CDC, NIH
2019	USDA	Incorporate bioinformatics and metagenomics technologies into the current AAVLD-APHIS AMR surveillance pilot project to expand resistance monitoring in identified pathogens of importance to animal and public health.	APHIS
2020	HHS	Continue to provide the public health community with capabilities in next-generation WGS and related technologies, methods and platforms, and advanced computational and informatics tools for enhanced pathogen identification and to inform development of MCMs and subsequent technologies.	CDC, NIH

Table 24. JEE RECOMMENDATION 4 (JEE INDICATOR D.1.2): *Explore the appropriate protocols for rapid and safe sample sharing in anticipation of or during a public health emergency.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Develop a white paper proposing actions that the federal government can take to support SLTT efforts to collect and transport specimens during a potential or actual public health emergency. Actions to explore include: ▪ Determining contracting and funding capabilities to create a contract (multiple if needed) for sample collection and shipment during an emergency. ▪ Identifying sources of existing programmatic or operational funding federal government departments and agencies could use to perform sample management functions (e.g., propagation and distribution) as part of federal government preparedness and response efforts. ▪ Determining the feasibility of developing a generic protocol that SLTT health departments could use to collect a range of specimens (e.g., blood, urine, and saliva) that may be required for preparedness and response research during an emergency. ▪ Identifying policy options for expediting institutional review board (IRB) review at the institutional level during an emergency such as establishing a policy of reliance on a central IRB for review. ▪ Determining if guidance to SLTT officials on the implementation of federal policy and regulations relevant to specimen collection is adequate (e.g., human subject protections regulations and the application of the Health Insurance Portability and Accountability Act of 1996).	ASPR, CDC, NIH
2019	HHS	Develop a generic specimen collection protocol to use as a model during a public health emergency.	ASPR, CDC
2019	HHS	Socialize, select, and implement policy options that expedite IRB reviews during a public health emergency.	ASPR, CDC
2019	HHS	Refine existing guidance, where needed, for SLTT that clarify implementation of federal policies and regulations related to protection of human research subjects when collecting specimens for research related to preparedness and response.	ASPR, CDC

Table 25. JEE RECOMMENDATION 5 (JEE INDICATORS D.1.1 and D.1.2): *Continue to engage in various global laboratory networks including sharing resources, experiences, data, and biological samples taking into consideration the global benefits.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Work through forums such as the Global Health Security Initiative's Risk Management and Communications Working Group and the Global Laboratory Network Working Group to support the development of international policies and agreements related to sharing specimens during emergencies, including by participating in the implementation of WHO's Research and Development Blueprint and WHO's Pandemic Influenza Preparedness Framework.	ASPR
2018	USDA	Continue to support OIE's One Health objectives including the timely reporting of all OIE-listed diseases through the NAHRS.	APHIS
2018	USDA	Continue to serve, through NVSL and CVB, as an OIE Collaborating Center for the Diagnosis of Animal Diseases and Vaccine Evaluation in the Americas.	APHIS
2018	USDA	Continue to serve, through NVSL, as an OIE reference laboratory for the following animal diseases: avian influenza; anthrax; bluetongue; contagious equine metritis; eastern, western, and Venezuelan equine encephalomyelitis; equine infectious anemia; foot-and-mouth disease; leptospirosis; Newcastle disease; pseudorabies; swine influenza; vesicular stomatitis; and West Nile fever.	APHIS
2018	USDA	Continue to serve, through NVSL, as a FAO Reference Center for animal influenza and Newcastle disease, and bovine tuberculosis and paratuberculosis.	APHIS
2018	USDA	Continue to serve as an OIE collaborating center for "Research on Emerging Avian Diseases."	ARS
2019	HHS	Continue to engage in international fora to identify and develop global mechanisms to facilitate the rapid sharing of specimens during public health emergencies.	ASPR
2019	USDA	Continue to serve as an OIE collaborating center for "Research on Emerging Avian Diseases."	ARS
2020	USDA	Continue to serve as an OIE collaborating center for "Research on Emerging Avian Diseases."	ARS
2020	USDA	Continue to participate in OIE/FAO global OIE/FAO Influenza Network (OFFLU) activities to reduce risks to animal and public health from animal influenza viruses.	APHIS
2020	USDA	Continue to support OIE's One Health objectives including the timely reporting of all OIE-listed diseases through the NAHRS.	APHIS
2020	USDA	Continue to serve, through NVSL and CVB, as an OIE Collaborating Center for the Diagnosis of Animal Diseases and Vaccine Evaluation in the Americas.	APHIS

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	USDA	Continue to serve, through NVSL, as an OIE reference laboratory for the following animal diseases: avian influenza; anthrax; bluetongue; contagious equine metritis; eastern, western, and Venezuelan equine encephalomyelitis; equine infectious anemia; foot-and-mouth disease; leptospirosis; Newcastle disease; pseudorabies; swine influenza; vesicular stomatitis; and West Nile fever. (USDA/APHIS)	APHIS
2020	USDA	Continue to serve, through NVSL, as a FAO Reference Center for animal influenza and Newcastle disease, and bovine tuberculosis and paratuberculosis. (USDA/APHIS)	APHIS
2020	USDA	Continue to serve as an OIE collaborating center for “Research on Emerging Avian Diseases.”	ARS

DETECT 2 — Real-Time Surveillance

JEE Target

Strengthened foundational indicator- and event-based surveillance systems that are able to detect events of significance for public health, animal health, and health security; improved communication and collaboration across sectors and between sub-national (local and intermediate), national, and international levels of authority regarding surveillance of events of public health significance; and, improved country and intermediate level/regional capacity to analyze and link data from and between strengthened, real-time surveillance systems including interoperable, interconnected electronic reporting systems. This can include epidemiologic, clinical, laboratory, environmental testing, product safety and quality, and bioinformatics data; and, advancement in fulfilling the core capacity requirements for surveillance in accordance with IHR and the OIE standards.

Indicators

D2.1 *Indicator and event based surveillance systems*	**2016 Capacity Level: 5**
D2.2 *Inter-operable, interconnected, electronic real-time reporting system*	**2016 Capacity Level: 3**
D2.3 *Analysis of surveillance data*	**2016 Capacity Level: 5**
D2.4 *Syndromic surveillance systems*	**2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

The United States has an extensive system for public health surveillance that is capable of quickly detecting major outbreaks. However, there are inconsistent linkages between key aspects of the human and animal surveillance systems, and there could be significant improvements in the rapid acquisition, processing, and interpretation of electronic data.

2016 JEE Recommendations from the External Evaluators

1. Create opportunities for United States departments and agencies to exchange and integrate the results of their respective surveillance programs in a better manner.
2. Enhance strategies and partnerships to increase the use and interoperability of electronic health care records.
3. Increase the number of trained personnel at subnational levels who are capable of collecting and analyzing large volumes of diverse data and integrating that information with non-clinical information sources.

Summary of Action Items

Efforts will focus on further integration and rapid exchange of surveillance information among departments and agencies, testing and improving interoperability of electronic health care records, and increasing trained personnel at the SLTT levels to strengthen surveillance systems. Activities will also include the development and promotion of indicator-based surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface.

Action Items

Table 26. JEE RECOMMENDATION 1 (JEE INDICATOR D.2.1): *Create opportunities for United States departments and agencies to exchange and integrate the results of their respective surveillance programs in a better manner.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS, USDA	Develop a plan for increasing interagency liaison activity between the National Biosurveillance Integration Center and 14 federal departments and agencies.	DHS, USDA
2019	DHS, DoD	Provide an information technology system designed to integrate and exchange surveillance information between departments and agencies as part of a national targeting capability.	DHS, DoD

Table 27. JEE RECOMMENDATION 2 (JEE INDICATORS D.2.2 and D.2.4): *Enhance strategies and partnerships to increase the use and interoperability of electronic health care records.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS, VA	Develop an IT system and CONOPS for interagency analysis of de-identified electronic health records.	DHS, VHA
2018	DoD	Implement upgrade of DoD's Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE) to enable compatibility with interagency for comprehensive syndromic surveillance.	DoD
2018	HHS	Develop requirements and technical architecture for eCR.	CDC
2018	HHS	Pilot test technical specifications to demonstrate viability of eCR for public health and health care in six sites.	CDC
2019	DoD	Develop collaborative enhancements of ESSENCE to meet interagency and DoD requirements.	DoD

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	HHS	Assess and evaluate pilot implementation of eCR.	CDC
2019	HHS	Continue national implementation of eCR through addition of participating sites.	CDC
2019	VA	Create a Next-Generation Electronic Health Record that is fully interoperable with DoD and community partners and continues to promote clinician involvement and innovation.	VHA
2020	DoD	Create interagency partnerships for syndromic surveillance using ESSENCE.	DoD
2020	HHS	Continue national implementation of eCR through addition of participating sites.	CDC

Table 28. JEE RECOMMENDATION 3 (JEE INDICATOR D.2.3): *Increase the number of trained personnel at subnational levels who are capable of collecting and analyzing large volumes of diverse data and integrating that information with non-clinical information sources.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS	Pursue a third party platform that SLTT users can integrate and analyze emergency medical service (EMS) data with complementary data sources such as emergency 911 calls, law enforcement, or highway safety data.	DHS
2018	DoD	Begin online and in-person training of updated ESSENCE for users.	DoD
2018	HHS	Explore opportunities among interagency partners to support strengthening and expanding public health workforce capabilities at the SLTT level.	CDC
2018	USDA	Assess opportunities to strengthen and expand workforce capabilities at the state and local levels in the analysis and interpretation of animal health data.	USDA
2019	DoD	Ensure that two users per medical treatment facility are trained in ESSENCE, which is moving to the same code base/software version as the CDC and over half the states in the United States.	DoD
2019	HHS	Develop a strategy to engage department and agency programs to draft and pilot comprehensive workforce strengthening models based on identified gaps (potentially extending into 2020).	CDC
2019	HHS	Identify additional opportunities to strengthen and expand public health workforce capabilities at the SLTT level.	CDC
2019	HHS	Identify scenario-based threat activities and related workforce needs.	CDC

Table 29. OTHER ACTIVITIES (JEE INDICATOR D.2.1)

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOI, HHS, USDA	Support federal and non-federal institutions and investigators in efforts to apply surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface and perform research to enhance understanding of the molecular, ecological, and/or environmental factors that influence pathogenesis, transmission, and evaluation of emerging and re-emerging pathogens.	USGS, CDC, NIH, USDA
2018	USDA	Pilot and evaluate indicator- and model-based tools for global monitoring and early detection and characterization of potentially emerging or re-emerging pathogens in domestic poultry, livestock, and aquaculture populations.	USDA
2019	DOI, HHS, USDA	Continue to support federal and non-federal institutions and investigators in efforts to apply surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface and perform research to enhance understanding of the molecular, ecological, and/or environmental factors that influence pathogenesis, transmission, and evaluation of emerging and re-emerging pathogens.	USGS, CDC, NIH, USDA
2020	DOI, HHS, USDA	Continue to support federal and non-federal institutions and investigators in efforts to apply surveillance tools and strategies for the rapid detection and characterization of emerging and re-emerging pathogens at the animal-human interface and perform research to enhance understanding of the molecular, ecological, and/or environmental factors that influence pathogenesis, transmission, and evaluation of emerging and re-emerging pathogens.	USGS, CDC, NIH, USDA

DETECT 3 — Reporting

JEE Target

Timely and accurate disease reporting according to WHO requirements and consistent coordination with FAO and OIE.

Indicators

D3.1 *System for efficient reporting to WHO, FAO, and OIE* **2016 Capacity Level: 5**

D3.2 *Reporting network and protocols in country* **2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

The United States has an effective system in place for assessing public health events at the federal level and notifying WHO of public health events. However, the protocols within federal departments and agencies and at SLTT levels require improvement to minimize inconsistency and reporting delays.

2016 JEE Recommendations from the External Evaluators

1. Improve understanding of FAO, OIE, and WHO requirements among federal, state, and local stakeholders through multisectoral discussions.
2. Work towards developing consistency in reporting on IHR requirements across all agencies and subnational health departments.
3. Improve overall coordination among all reporting entities by developing a policy on international event reporting.

Summary of Action Items

Efforts will focus on raising awareness and understanding at the federal and SLTT levels about the IHR and its requirements through trainings, dissemination of training tools, and development of an internal HHS policy framework to enhance ASPR's coordination during an event at the national-international interface. Staff members who support the U.S. IHR NFP will collaborate with federal departments and agencies and national non-governmental actors (e.g., Council of State and Territorial Epidemiologists (CSTE), National Association of County and City Health Officials (NACCHO), and Association of State and Territorial Health Officials (ASTHO)) to refine existing policies and procedures that support IHR-related reporting and to reduce the lag in notifying WHO and

other international organizations of public health events. To improve regional and global reporting in the interest of protecting U.S. health security, the U.S. IHR NFP will participate in IHR NFP strengthening workshops outside of the United States.

Action Items

Table 30. JEE RECOMMENDATION 1 (JEE INDICATOR D.3.2): *Improve understanding of FAO, OIE, and WHO requirements among federal, state, and local stakeholders through multisectoral discussions;* **JEE RECOMMENDATION 4 (JEE INDICATOR P.2.1):** *Enhance consistency among federal agencies to ensure that each has an internal IHR protocol that aligns with the IHR NFP processes*; and **JEE RECOMMENDATION 2 (JEE INDICATOR D.3.1):** *Work towards developing consistency in reporting on IHR requirements across all agencies and subnational health departments.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	Multiple	Develop and implement the U.S. IHR NFP Strengthening Strategy, coordinating with federal partners to leverage existing SLTT partnerships in all sectors, including the national public health organizations, to further reduce/prevent reporting and WHO notification delays, streamline event risk assessments, and increase the value of the global NFP network to federal and SLTT partners.	ASPR, CDC
2018	Multiple	Coordinate with federal partners to help develop or revise IHR-related standard operating procedures (SOP) of the following departments and agencies: DHS, DoD, DOI, and HHS/CDC.	ASPR, CDC
2018	Multiple	Facilitate finalization of U.S. International Food Safety Authorities Network (INFOSAN)-IHR event communication protocol through HHS/FDA-HHS/CDC-USDA memorandum of understanding.	ASPR, CDC
2019	HHS, USDA	Finalize U.S. OIE-IHR event communication protocol.	ASPR, USDA
2019	Multiple	Based on the U.S. IHR NFP Strengthening Strategy, continue to conduct activities that further reduce/prevent reporting and WHO notification delays, streamline event risk assessments, and increase the value of the global NFP network to federal and SLTT partners.	ASPR, CDC
2019	Multiple	Coordinate with federal partners to help develop or revise IHR-related SOP of the following departments and agencies: HHS/FDA, USDA, and VA.	ASPR, CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	Multiple	Based on the U.S. IHR NFP Strengthening Strategy, continue to conduct activities that further reduce/prevent reporting and WHO notification delays, streamline event risk assessments, and increase the value of the global NFP network to federal and SLTT partners.	ASPR, CDC
2020	Multiple	Coordinate with federal partners to help develop or revise IHR-related SOP of the following departments and agencies: DOC, DOJ, DOT, and U.S. Coast Guard (USCG).	ASPR, CDC

DETECT 4 — Workforce Development

JEE Target

States Parties should have skilled and competent health personnel for sustainable and functional public health surveillance and response at all levels of the health system and the effective implementation of the IHR. A workforce includes physicians, animal health or veterinarians, biostatisticians, laboratory scientists, farming/livestock professionals, and an optimal target of one trained field epidemiologist (or equivalent) per 200,000 population, who can systematically cooperate to meet relevant IHR and the OIE Performance of Veterinary Services core competencies.

Indicators

D.4.1 *Human resources are available to implement IHR core capacity requirements*	**2016 Capacity Level: 5**
D.4.2 *Applied epidemiology training program in place such as FETP*	**2016 Capacity Level: 5**
D.4.3 *Workforce strategy*	**2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

The United States has a robust and highly skilled public health workforce, largely at the federal level. The workforces in some states remain under-resourced.

2016 JEE Recommendations from the External Evaluators

1. Use data sources to study the existing multidisciplinary public health workforce and anticipated gaps between human resource needs and staffing at state and local levels to:
    a. Supplement the current knowledge on staff enumeration and help in projection and planning; and,
    b. Inform the CDC plan to create a National Action Plan for public health workforce development.
2. Establish workforce staffing and incentives models in collaboration with existing agency programs to reduce human resources gaps through either current or new public support models.
3. Increase focus of existing programs towards human resource recruitment, development, and retention.

Summary of Action Items

Efforts will focus on identifying and addressing gaps in the public health workforce at the SLTT level. This will include conducting evaluations of existing trainings and exercises and using this data to inform and strengthen existing workforce development efforts (e.g., trainings, exercises, and programs) aimed at increasing public health emergency preparedness.

Action Items

Table 31. JEE RECOMMENDATION 1 (JEE INDICATORS D.4.1 and D.4.3): *Use data sources to study the existing multidisciplinary public health workforce and anticipated gaps between human resource needs and staffing at state and local levels to: (a) supplement the current knowledge on staff enumeration and help in projection and planning; and, (b) inform the CDC plan to create a National Action Plan for public health workforce development.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Synthesize information about state and local health departments' workforce ability to fully staff and operationalize distribution and dispensing of life saving MCMs in the event of a public health emergency.	ASPR, CDC
2018	HHS	Finalize the list of MCM Critical Knowledge, Skills, and Abilities and report evaluations of state and local workforce training needs in partnership with ASTHO and NACCHO.	ASPR, CDC
2018	HHS	Outline plans to inventory known gaps in data, information, and best practices related to state and local public health workforce needs.	CDC
2018	HHS	Inventory existing federal grants and other programs aimed at public health workforce development.	HRSA
2018	HHS	Survey SLTT representatives regarding existing public health workforce requirements, barriers to hiring and retaining the workforce, resources to study the workforce, opportunities to leverage resources in collaboration with organizations and other departments and agencies to address workforce development, and best practices/lessons learned from SLTT representatives (potentially leading into 2019).	HRSA
2018	USDA	Identify best practices and methods to strengthen multi-sector preparedness and response to review and strengthen existing training programs.	APHIS
2018	USDA	Identify state veterinarians who have not had training in transboundary and emerging diseases and One Health concepts and methods for multi-sector response.	APHIS

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	HHS	Expand workforce evaluation of state and local health departments to core preparedness and response capability areas beyond MCMs (such as emergency management).	ASPR, CDC
2019	HHS	Update strategy to address workforce development for public health emergency preparedness and response in state and local health departments (supported through PHEP).	ASPR, CDC
2019	HHS	Inventory existing data, information, and best practices that provide evidence for improving the comprehensive understanding of the public health workforce development needs at the state and local level.	CDC
2019	HHS	Integrate assessment of state and local public health workforce needs that remain incompletely defined, where feasible, into planned data collection by governmental and non-governmental partners.	CDC
2019	USDA	Review evaluation data from joint training and exercises hosted by HHS/CDC and USDA/APHIS to strengthen future delivery of trainings, as outlined in the VS National Training and Exercise Program, and ensure training involves state counterparts.	APHIS
2019	USDA	Conduct needs assessment of employees to determine training needs (on 3-year cycle).	APHIS
2019	USDA	Work with governmental and non-governmental partners to identify and integrate One Health core competencies into technical- and sector-specific trainings.	APHIS
2020	HHS	Outline plans to inventory known gaps in data, information, and best practices related to tribal and territorial public health workforce needs.	CDC
2020	HHS	Develop a strategy to integrate assessment findings into a public health workforce development plan.	CDC
2020	HHS, USDA	Collaborate to identify local and state personnel that need training, prioritize training gaps, and deliver targeted joint training.	CDC, APHIS

Table 32. JEE RECOMMENDATION 2 (JEE INDICATOR D.4.1): *Establish workforce staffing and incentives models in collaboration with existing agency programs to reduce human resources gaps through either current or new public support models.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Outline plans to inventory and identify existing workforce models that potentially address needs at the state and local level.	CDC
2018	HHS	Develop a plan to inventory state and local health departments staffing needs based on capabilities, threat, function, or a combination thereof.	CDC
2018	USDA	Review and assess the APHIS-VS Succession Plan and other workforce development planning materials for veterinary and animal health-specific competencies and multi-sectoral competencies.	APHIS
2018	USDA	Update existing models and training frameworks to minimize gaps and provide employees with both technical and multisectoral competencies needed to work with other sectors to respond to complex health challenges.	APHIS
2018	USDA	Train veterinary researchers to work on Biosafety Level (BSL)-4 zoonotic agents in preparation for the National Bio and Agro-defense Facility (NBAF).	ARS
2019	HHS	Develop a strategy to engage department and agency programs to draft and pilot comprehensive workforce strengthening models based on identified gaps (potentially extending into 2020).	CDC
2019	HHS	Outline plans to inventory and identify existing workforce models that potentially address needs at the tribal and territorial level.	CDC
2019	HHS	Seek resources to support department and agency strategy.	CDC
2019	HHS	Identify scenario-based threat activities and needs for supporting the workforce.	CDC
2019	USDA	Continue to train veterinary researchers to work on Biosafety Level (BSL)-4 zoonotic agents in preparation for the NBAF.	ARS
2020	HHS	Contingent on identification of sufficient resources, implement strategy to engage department and agency programs to draft and pilot comprehensive workforce strengthening models.	CDC
2020	HHS	Establish state/regional collaboratives to develop and implement human and resource staffing models that meet unique geographic requirements.	HRSA

Table 33. JEE RECOMMENDATION 3 (JEE INDICATOR D.4.1): *Increase focus of existing programs towards human resource recruitment, development, and retention.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Further implement and evaluate training in information management.	NIH
2018	USDA	Review outcomes from recruitment and retention programs and identify areas to strengthen.	APHIS
2018	USDA	Continue evaluation and delivery of existing technical training programs to ensure employees have the skills they need to be successful.	APHIS
2019	USDA	Further evaluate and implement the Veterinary Medical Officer Career Program.	APHIS
2019	USDA	Identify existing operational capacity to support multisectoral work and identify opportunities to strengthen through training or other human resource programs.	APHIS
2019	USDA	Create a framework to strengthen and focus outreach and education about existing human resource recruitment tools including student pathways and scholarship programs.	APHIS
2020	USDA	Continue to train veterinary researchers to work on Biosafety Level (BSL)-4 zoonotic agents in preparation for the NBAF.	ARS
2020	USDA	Continue sponsoring VS employee training in HHS/CDC's Epidemic Intelligence Service and other applied field epidemiology training programs.	APHIS

RESPOND 1 — Preparedness

JEE Target

Preparedness includes the development and maintenance of national, intermediate, and local or primary response level public health emergency response plans for relevant chemical, biological, radiological, and nuclear (CBRN) hazards. This covers mapping of potential hazards, identification and maintenance of available resources including national stockpiles, and the capacity to support operations at the intermediate and local or primary response levels during a public health emergency.

Indicators

R.1.1 *Multi-hazard national public health emergency preparedness and response plan is developed and implemented* **2016 Capacity Level: 5**

R.1.2 *Priority public health risks and resources are mapped and utilized* **2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

The United States has complex federal and SLTT structures for public health emergency preparedness and response, which necessitate consistency and coordination in response plans and systems.

2016 JEE Recommendations from the External Evaluators

1. Incorporate emergency preparedness into technology platforms.
2. Assess the impact of corrective actions implemented as a result of lessons learned.
3. Address challenges in coordinating responses to complex incidents that do not receive Stafford Act declarations.
4. Develop exercises that involve state and other local partners including the private sector.

Summary of Actions Items

Efforts will focus on continuing to strengthen emergency preparedness through technology platforms; developing new—and enhancing existing—multi-platform tools and resources; coordinating planning for responding to complex incidents that do not receive Stafford Act declarations through such activities as exercises linked to the Biological Incident Annex to the Response and

Recovery Federal Interagency Operational Plans and the National Response Framework that include state and local partners in exercises (e.g., the Pandemic Influenza exercise, Gotham Shield nuclear/radiological response exercise, and recent past exercises linked to Zika Virus responses); developing formal guidance that standardizes post-event/exercise CAP and the after action review/reporting (AAR) processes used by federal and SLTT public health planners; and, collaborating among federal and SLTT partners to develop higher quality and more inclusive public health CONOPS, documents, and exercises.

Action Items

Table 34. JEE RECOMMENDATION 1 (JEE INDICATOR R.1.1): *Incorporate emergency preparedness into technology platforms.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Work with Regional Emergency Coordinators to develop regional emergency preparedness profiles using capabilities of a dynamic geographic information system (GIS) application for regional preparedness to spatially layer data on a web-based, dynamic GIS application that would serve as a regional emergency preparedness tool.	ASPR, CDC
2018	HHS	Incorporate public health and medical infrastructure and region-specific threats into the GIS regional emergencies preparedness tool.	ASPR
2018	HHS	Develop demographic profiles and highlight vulnerable/at-risk populations in the GIS regional emergencies preparedness tool.	ASPR
2018	HHS	Collaborate with SLTT partners to include points of contact and additional reference information in the GIS regional emergencies preparedness tool.	ASPR
2018	HHS	Utilize existing technical assistance platforms, such as the ASPR Technical Resources, Assistance Center, and Information Exchange (TRACIE) technical resource database and web platform for health care emergency preparedness personnel and CDC's Online Technical Resource and Assistance Center (On-TRAC) technical assistance platform, to store and make available resource material, after action reports, and lessons learned documents for emergency preparedness personnel.	ASPR, CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Utilize existing just-in-time response, clinical, and decision support platforms, such as ASPR and NIH's Radiation Emergency Medical Management (REMM), ASPR and NIH's Chemical Hazards Emergency Medical Management (CHEMM), Wireless Information System for Emergency Responders (WISER), Primary Response Incident Scene Management (PRISM), and the Dermal Exposure Risk Management and Logic for Emergency Preparedness and Response (DERMaL eToolkit) to inform responders, decision makers, and response operations.	ASPR, CDC, NIH
2018	HHS	Maintain and enhance web-accessible data collection tools, resources, and health information to assist emergency response personnel in preparations for, and during response to, incidents. (*See* Disaster Research Response Data Collection Tools and Resources developed as part of the NIH Disaster Research Response Program and distributed through the Disaster Information Management Research Center website.)	NIH
2018	HHS	Continue to develop Virtual Incident Command System Training and HID Emergency Management training tools and continue Resilient Communications research programs.	NIH
2018	HHS	Initiate research and development to apply machine-learning techniques to disaster response tools and disaster preparedness training applications.	NIH
2018	USDA	Support research responsive to emergent situations, including gaps in knowledge, emerging transboundary and zoonotic diseases, and veterinary medical countermeasures in response to disease outbreaks through the Agriculture and Food Research Initiative Exploratory Program and other mechanisms as appropriate.	NIFA
2019	HHS	Demonstrate the use of regional emergency preparedness profiles in the GIS regional emergencies preparedness tool.	ASPR
2019	HHS	Assess strengths, gaps, and areas for improvement of the GIS regional emergencies preparedness tool.	ASPR
2019	HHS	Explore available innovative data sources and integrate new data sets as appropriate into the GIS regional emergencies preparedness tool.	ASPR
2019	HHS	Using machine learning, tailor the user experience and messaging capabilities of the ASPR TRACIE website to target messaging and resource recommendations to specific users, user types, and geographic locations.	ASPR

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	HHS	Continue to enhance web-accessible data collection tools, resources, and health information to assist emergency response personnel in preparations for, and during the response to, incidents. (*See* Disaster Research Response Data Collection Tools and Resources developed as part of the NIH Disaster Research Response Program and distributed through the Disaster Information Management Research Center website.)	NIH
2019	HHS	Continue to develop Virtual Incident Command System and HID Emergency Management training tools and continue Resilient Communications research programs (subject to availability of funds).	NIH
2019	HHS	Continue research and development to apply machine-learning techniques to disaster response tools and disaster preparedness training applications.	NIH
2019	HHS	Continue to support non-federal research scientists for projects related to the medical and public health aspects of disasters, public health emergencies, and emerging issues to help inform further enhancement of web-based tools and information resources.	NIH
2019	HHS	Collect, organize and disseminate technology platforms and resources to support disaster research, training, and information dissemination (existing platforms and those under development).	NIH
2019	HHS	Continue to maintain and update information and training resources for emergency preparedness and response.	NIH
2019	USDA	Continue emergency research to address gaps in knowledge and veterinary medical countermeasures in response to disease outbreaks.	ARS
2019	USDA	Continue to support research responsive to emergent situations including gaps in knowledge, emerging transboundary and zoonotic diseases, and veterinary medical countermeasures in response to disease outbreaks through the Agriculture and Food Research Initiative Exploratory Program and other mechanisms as appropriate.	NIFA
2020	HHS	Work to incorporate data sets from other departments and agencies into the GIS regional emergencies preparedness tool to support predictive modeling of public health and medical concerns.	ASPR
2020	HHS	Work with other departments and agencies to explore the potential for predictive modeling of certain natural disasters (e.g., mudslides and wildfires) in the GIS regional emergencies preparedness tool.	ASPR

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS	Continue to enhance web-accessible data collection tools, resources, and health information to assist emergency response personnel in preparations for, and during the response to, incidents. (*See* Disaster Research Response Data Collection Tools and Resources developed as part of the NIH Disaster Research Response Program and distributed through the Disaster Information Management Research Center website.)	NIH
2020	HHS	Continue to develop Virtual Incident and Command System and HID Emergency Management training tools and continue Resilient Communications research programs (subject to the availability of funds).	NIH
2020	HHS	Continue research and development to apply machine-learning techniques to disaster response tools and disaster preparedness training applications.	NIH
2020	HHS	Continue to support non-federal research scientists for projects related to the medical and public health aspects of disasters, public health emergencies, and emerging issues to help inform further enhancement of web-based tools and information resources.	NIH
2020	HHS	Continue to collect, organize and disseminate technology platforms and resources to support disaster research, training, and information dissemination (existing platforms and those under development).	NIH
2020	USDA	Continue emergency research to address gaps in knowledge and veterinary medical countermeasures in response to disease outbreaks.	ARS
2020	USDA	Continue to support research responsive to emergent situations including gaps in knowledge, emerging transboundary and zoonotic diseases, and veterinary medical countermeasures in response to disease outbreaks through the Agriculture and Food Research Initiative Exploratory Program and other mechanisms as appropriate.	NIFA

Table 35. JEE RECOMMENDATION 2 (JEE INDICATOR R.1.2): *Assess the impact of corrective actions implemented as a result of lessons learned.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Submit reauthorization language for PAHPRA outlining more clearly the response coordination lines of authority and doctrine/frameworks to follow during all-hazards events.	ASPR
2018	HHS	Develop and implement a formal CAP to use for all emergency responses and events.	ASPR
2018	HHS	Establish a formal AAR process that identifies lessons learned and corrective actions.	ASPR
2018	HHS	Adjust plans, operating procedures, and CONOPS using the AARs and CAP that correct the identified shortfalls and/or gaps or new practices/approaches or best practices identified.	ASPR
2018	USDA	Review Interagency Agreements instituted in 2016 as a result of an AAR that provide mobilization of staff and resources from across USDA during large-scale emergency responses and events.	USDA
2019	HHS	Compile gaps and recommendations for improving the operationalization of the National Response Framework (NRF) during all-hazards events, both with and without Stafford Act declarations.	ASPR
2020	HHS	Submit formal revisions for the NRF and associated and relevant response annexes to ensure effective U.S. Government responses to all-hazards events that could potentially threaten national health security.	ASPR
2020	USDA	Update Interagency Agreements among agencies internal to USDA that provide for staff and resources for a critical response that requires a departmental response but has not received Stafford Act declaration.	USDA

Table 36. JEE RECOMMENDATION 3 (JEE INDICATOR R.1.1): *Address challenges in coordinating responses to complex incidents that do not receive Stafford Act declarations.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS, HHS	Train and exercise on the 2017 Biological Incident Annex to the U.S. Response Federal Interagency Operations Plan to ensure collaboration, coordination and unity of effort to a biological incident.	FEMA, ASPR
2018	HHS	Support non-federal research scientists for projects related to the medical and public health aspects of disasters, public health emergencies, and emerging issues to help inform further enhancement of web-based tools and information resources.	NIH
2018	HHS	Convene key federal government stakeholders to address gaps in the NRF, both in the language of the NRF and in interagency practices surrounding the NRF's usage.	ASPR
2019	DHS, HHS	Continue to train and exercise on the 2017 Biological Incident Annex to the U.S. Response Federal Interagency Operations Plan to ensure collaboration, coordination and unity of effort to a biological incident.	FEMA, ASPR
2019	HHS	Assess changes made to plans, operating procedures, and CONOPS to institutionalize lessons learned.	ASPR
2019	HHS	Provide leadership a "quick look" at the early onset of a response to help focus on gaps and lessons learned from past events using the CAP and lessons learned trends.	ASPR
2020	DHS, HHS	Continue to train and exercise on the 2017 Biological Incident Annex to the U.S. Response Federal Interagency Operations Plan to ensure collaboration, coordination and unity of effort to a biological incident.	FEMA, ASPR
2020	HHS	Adjust exercises and organizational budgets to reflect process improvements and to test effectiveness of plans, policies, and procedures.	ASPR
2020	HHS	Coordinate planning and exercises with consideration of complex incidents that do not receive Stafford Act declarations.	ASPR, CDC
2020	HHS	Develop a crisis response funding option that minimizes challenges in coordinating response funding options for complex incidents that do not receive Stafford Act declarations.	ASPR, CDC
2020	USDA	Update Interagency Agreements among agencies internal to USDA that provide for staff and resources for a critical response that requires a departmental response but has not received Stafford Act declaration.	USDA

Table 37. JEE RECOMMENDATION 4 (JEE INDICATOR R.1.2): *Develop exercises that involve state and other local partners including the private sector.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Support interagency discussions and planning (e.g., Biological Incident Annex – HHS; International Assistance CONOPs – DHS/FEMA) for coordinating public health emergencies when there is no active or imminent emergency declaration under Emergency Support Function (ESF)[19] No. 8 (Public Health and Medical Services)[20] .	ASPR
2018	USDA	Initiate emergency research to address gaps in knowledge and veterinary medical countermeasures in response to disease outbreaks.	ARS
2018	DHS	Work with Regional Emergency Coordinators and DHS/FEMA CBRN Coordinators to educate/inform state and local emergency managers on developing biological plans by using the Key Planning factors and Considerations for Response to a Biological Incident.	FEMA
2018	DHS, HHS	Hold a NLE to test CONOPS and inform further development/enhancements.	DHS, ASPR
2018	DoD, HHS	Continue to conduct regional tabletop exercises to engage major metropolitan areas to consider preparedness needs for a medical surge resulting from distant radiological disasters in partnership with private sector coalitions and organizations such as the National Marrow Donor Program's (NMDP) Radiation Injury Treatment Network (RITN).	DoD, AHRQ, ASPR
2018	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA

[19] "Emergency Support Functions (ESF) are the grouping of governmental and certain private sector capabilities into an organizational structure to provide support, resources, program implementation, and services that are most likely needed to save lives, protect property and the environment, restore essential services and critical infrastructure, and help victims and communities return to normal following domestic incidents." (HHS/ASPR. "Emergency Support Functions.").

[20] ESF No. 8 (Public Health and Medical Services) "provides the mechanism for coordinated federal assistance to supplement state, tribal, and local resources in response to the following: public health and medical care needs, veterinary and/or animal health issues in coordination with the USDA, potential or actual incidents of national significance, and a developing potential health and medical situation." (HHS/ASPR. "ESF No. 8—Public Health and Medical Services").

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Conduct a series of exercises at the federal and SLTT levels to demonstrate the ability to transport patients with HID.	ASPR
2018	HHS	Continue to engage in both external and internal AARs after events and exercises at the national and regional level to develop corrective actions for identified needs and gaps.	ASPR
2018	HHS	Identify gaps in the current planning process for public health exercises.	ASPR
2018	HHS	Establish a national public health exercise calendar with respect to which participants from the states may volunteer.	ASPR
2018	HHS	Identify and enhance processes to include all U.S. Government sectors in NLE with a public health component.	ASPR
2018	HHS	Incorporate AARs from U.S. responses that activate ESF No. 8 into preparedness and response documents and activities.	ASPR
2018	Multiple	Engage state and other local partners for representation in exercises used to validate response planning.	CDC in coordination with others
2018	USDA	Conduct at least one food safety exercise to document capability and capacity to respond to emergencies caused by specific agents.	FSIS
2019	DHS	Continue to work with Regional Emergency Coordinators and DHS/FEMA CBRN Coordinators to educate/inform state and local emergency managers on developing biological plans by using the Key Planning factors and Considerations for Response to a Biological Incident.	FEMA
2019	DoD, HHS	Test the hematologic lab surge plan through an exercise and publish a template plan for use by the preparedness community in partnership with private sector coalitions and organizations such as the NMDP's RITN.	DoD, AHRQ, ASPR

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA
2019	HHS	Continue to conduct HID transport exercises at the federal and SLTT levels.	ASPR
2019	HHS	Revise (and, as needed, create) a sub-national public health virtual tabletop exercise that includes actionable public health objectives for all sectors of government.	ASPR
2019	HHS	Revise, as needed, federal plans and procedures, and assist SLTT to revise their related plans.	ASPR
2019	HHS	Improve situational awareness among SLTT and federal partners during a radiological incident through exercises that focus on secure information exchange technology, predetermination of data needs, exercising the exchange of data in both directions, and working with all partners that will require data to ensure minimal impact on the provider of data.	ASPR, CDC
2019	HHS	Incorporate AARs from U.S. responses that activate ESF No. 8 into preparedness and response documents and activities.	ASPR
2019	USDA	Review evaluation data from joint training and exercises hosted by HHS/CDC and USDA/APHIS to strengthen future delivery as outlined in the VS National Training and Exercise Program, ensure training involves state counterparts.	APHIS
2020	DHS	Continue to work with Regional Emergency Coordinators and DHS/FEMA CBRN Coordinators to educate/inform state and local emergency managers on developing biological plans by using the Key Planning factors and Considerations for Response to a Biological Incident.	FEMA
2020	DoD, HHS	Continue to conduct regional tabletop exercises to engage major metropolitan areas to consider preparedness needs for a medical surge resulting from distant radiological disasters in partnership with private sector coalitions and organizations such as the NMDP's RITN.	DoD, AHRQ, ASPR
2020	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS	Conduct full-scale exercises that test rural and urban jurisdictions for complex and rare hazards.	ASPA, ASPR, CDC
2020	HHS	Revise sub-national exercises as needed to improve outcomes from SLTT exercises.	ASPR
2020	HHS	Incorporate AARs from U.S. responses that activate ESF #8 into preparedness and response documents and activities.	ASPR
2020	HHS	Conduct exercises or show through real health emergencies that communities are equal partners and that community engagement happens before, during, and after health emergencies.	CDC
2020	HHS	Coordinate with SLTT health departments to exercise plans for population radiation exposure/contamination monitoring consistent with the Nuclear/Radiological Incident Annex (NRIA) and state preparedness plans.	CDC
2020	HHS in coordination with others	Engage state and other local partners for representation in exercises used to validate response planning; revise sub-national exercises as needed to improve outcomes from SLTT exercises.	CDC in coordination with others

RESPOND 2 — Emergency Response Operations

JEE Target

Public health emergency operations centers (EOC) at all appropriate locations that are centrally coordinated, which have fully trained staff that meet core competencies for emergency management and systems in place to fully activate within two hours of an alert.

Indicators

R2.1 *Capacity to activate emergency operations*	**2016 Capacity Level: 5**
R2.2 *Emergency Operations Center operating procedures and plans*	**2016 Capacity Level: 4**
R2.3 *Emergency operations program*	**2016 Capacity Level: 4**
R2.4 *Case management procedures are implemented for IHR relevant hazards*	**2016 Capacity Level: 3**

Summary of U.S. Self-Assessment

Most federal departments and agencies have well-established EOC capacities, and those centers are connected and coordinated centrally during a major public health emergency. However, not all of the centers perform as effectively or efficiently as possible, and many of the state-level EOCs do not consistently plan or exercise adequately for public health emergencies.

2016 JEE Recommendations from the External Evaluators

1. Standardize minimum acceptable performance criteria for federal emergency management programs and consider a formal policy for accreditation across all federal agencies.
2. Create a systematic One Health cross-agency approach in activation, EOC operational procedures, plans, and full-scale exercises. This should include after-action reviews, delineating agency role and responsibilities, and developing liaison officers and surge staff personnel exchange.
3. Consider actions to help states and local health authorities fully implement existing federal guidelines on IHR-relevant hazards.

Summary of Actions Items

Efforts will focus on involving more federal and SLTT jurisdictions in NLE and ensuring that best practices and lessons learned are shared at all levels of government, in order to improve outcomes, internal and external communication, information sharing, and situational awareness, and to establish a common operating picture during events and exercises. Federal departments and agencies will also work to establish EOC standards and incident management systems for situational awareness, staffing, and staff education and training; provide federal support to SLTT programs to increase local capacities to identify, hold, treat, and transport patients with HID or physical contaminants or who are physically contaminated; and assist local medical networks to identify facilities capable of receiving such patients and coordinate with EMS providers.

Action Items

Table 38. JEE RECOMMENDATION 1 (JEE INDICATORS R.2.1 and R.2.3): *Standardize minimum acceptable performance criteria for federal emergency management programs and consider a formal policy for accreditation across all federal agencies; and* **JEE RECOMMENDATION 3 (JEE INDICATOR R.2.1):** *Consider actions to help states and local health authorities to fully implement existing federal guidelines on IHR-relevant hazards.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Encourage the accreditation of federal and SLTT emergency management programs through nationally recognized accreditation or certification process; compile a list of those accreditations and certifications.	ASPR, CDC
2018	HHS	Document/identify and share/distribute emergency management programs improvement processes used within SLTT and federal departments and agencies.	ASPR, CDC
2018	HHS	Assess current improvement processes used within SLTT and federal departments and agencies.	ASPR, CDC
2018	HHS	Encourage federal and SLTT authorities to establish written policies and procedures for EOC operations.	ASPR, CDC
2018	HHS	Assist federal and SLTT authorities in developing a CAP that identifies process improvement and best practices for EOC operations.	ASPR, CDC
2018	HHS	Continue to engage in both external and internal AARs after events and exercises at the national and regional levels to develop corrective actions for identified needs and gaps.	ASPR, CDC
2018	HHS	Identify baseline EOC standards/practices common across federal and SLTT EOCs.	ASPR, CDC
2018	HHS	Encourage federal and SLTT EOCs to document standards of practice and instruction.	ASPR, CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Establish credentialing standards for EOC operations and share with partner EOCs.	ASPR, CDC
2018	HHS	Develop regional and facility HID plans that include safe transport from within and outside the region.	ASPR, CDC
2018	HHS	Establish best practices and guidelines for EMS safe transport of patients with HID and the management/disposal of hazardous waste.	ASPR, CDC
2018	HHS	Conduct a series of exercises at the federal and SLTT levels to demonstrate the ability to transport patients with HID.	ASPR, CDC
2019	HHS	Establish a community of practice for EOC practitioners to foster information sharing.	ASPR
2019	HHS	Establish national accreditation body and standards through the established community of EOC practitioners.	ASPR
2019	HHS	Establish health-related training standards for EMS and air transport of patients with HID, in coordination with Federal Aviation Administration (FAA) and other DOT elements.	ASPR
2019	HHS	Identify safe transport systems (e.g., patient isolation units) to transport HID patients and work with relevant regulatory agencies to obtain all necessary authorizations.	ASPR
2019	HHS	Continue to conduct HID transport exercises at the federal and SLTT levels.	ASPR
2019	HHS	Establish/publish federal level emergency management training standards for functional IMS/EOC level positions and fund implementation programs.	ASPR, CDC
2020	HHS	Adjust regional and facility plans, using corrective action and lessons learned programs, to improve the safe transport of patients with HID.	ASPR

Table 39. JEE RECOMMENDATION 2 (JEE INDICATORS R.2.1, R.2.2, and R.2.3): *Create a systematic One Health cross-agency approach in activation, EOC operational procedures, plans, and full-scale exercises. This should include after-action reviews, delineating agency role and responsibilities and developing liaison officers and surge staff personnel exchange.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Identify current public health exercises that involve all sectors of government.	ASPR
2018	HHS	Identify gaps in current planning process for public health exercises.	ASPR
2018	HHS	Establish a national public health exercise calendar with respect to which participants from the states may volunteer.	ASPR
2018	HHS	Identify and enhance processes to include all federal government sectors in NLE with a public health component.	ASPR

CY			
2018	USDA	Maintain a roster of trained and certified individuals within USDA available to deploy from normal agency duties to provide service in their specific area of expertise during emergency events.	USDA
2019	HHS	Revise (and create as needed) a sub-national public health virtual tabletop exercise that includes actionable public health objectives for all sectors of government.	ASPR
2019	HHS	Revise, as needed, federal plans and procedures and assist SLTT partners to revise their related plans.	ASPR
2020	HHS	Revise sub-national exercises as needed to improve outcomes from SLTT exercises.	ASPR

RESPOND 3 — Linking Public Health and Security Authorities

JEE Target

In the event of a biological event of suspected or confirmed deliberate origin, a country will be able to conduct a rapid, multisectoral response including the capacity to link public health and law enforcement and to provide and/or request effective and timely international assistance including to investigate alleged use events.

Indicator

R3.1 *Public health and security authorities (e.g., law enforcement, border control, and customs) are linked during a suspect or confirmed biological event* **2016 Capacity Level: 5**

Summary of U.S. Self-Assessment

The U.S. Criminal-Epidemiological Investigation Model provides the foundation for the combined public health and law enforcement response to suspicious incidents, but the implementation of that model at the state level is inconsistent.

2016 JEE Recommendations from the External Evaluators

1. Determine the strategy and content for recurring basic and proposed advanced level Criminal-Epidemiological trainings at the national and subnational levels.
2. Develop FBI and subnational/SLTT public health department jurisdiction-specific written protocols for joint public health law enforcement investigations.

Summary of Action Items

Efforts will focus on expanding the number of individuals and SLTT agencies trained in the Criminal-Epidemiological Investigation Model including development of online learning tools and advanced training modules.

Action Items

Table 40. JEE RECOMMENDATION 1 (JEE INDICATOR R.3.1): *Determine the strategy and content for recurring basic and proposed advanced level Criminal-Epidemiological trainings at the national and subnational levels.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOJ, HHS	Complete six Joint Criminal-Epidemiological Investigations Workshops at the sub-national/jurisdictional level for public health, law enforcement, and multi-sectoral (e.g., military, agriculture/food safety, academic, and non-governmental organizations) personnel.	FBI, CDC
2018	DOJ, HHS	Develop new curriculum for the Joint Criminal-Epidemiological Investigations Workshops.	FBI, CDC
2019	DOJ, HHS	Complete six Joint Criminal-Epidemiological Investigations Workshops at the sub-national/jurisdictional level for public health, law enforcement, and multi-sectoral (e.g., military, agriculture/food safety, academic, and non-governmental organizations) personnel.	FBI, CDC
2019	DOJ, HHS	Develop an interactive, web-based capability to serve as the platform for the Advanced Criminal-Epidemiological Program.	FBI, CDC
2019	DOJ, HHS	Develop a five-year strategy for the FBI/CDC Criminal-Epidemiological Investigations Program.	FBI, CDC
2020	DOJ, HHS	Complete six Joint Criminal-Epidemiological Investigations Workshops at the sub-national/jurisdictional level for public health, law enforcement, and multi-sectoral (e.g., military, agriculture/food safety, academic, and non-governmental organizations) personnel.	FBI, CDC
2020	DOJ, HHS	Conduct pilot workshop for the Advanced Criminal-Epidemiological Program.	FBI, CDC

Table 41. JEE RECOMMENDATION 2 (JEE INDICATOR R.3.1): *Develop FBI and subnational/SLTT public health department jurisdiction-specific written protocols for joint public health law enforcement investigations.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	DOJ, HHS	Work with national, sub-national, and jurisdictional partners (e.g., NACCHO, ASTHO, and the National Governors Association) to identify SLTT public health authorities without a joint investigation protocol/memorandum of understanding (MOU).	FBI, CDC

RESPOND 4 — Medical Countermeasures and Personnel Deployment

JEE Target

A national framework for transferring (sending and receiving) MCMs and public health and medical personnel among international partners during public health emergencies.

Indicators

R4.1 *System is in place for sending and receiving MCMs during a public health emergency*	**2016 Capacity Level: 5**
R4.2 *System is in place for sending and receiving health personnel during a public health emergency*	**2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

A system is in place to send MCMs internationally and a framework to develop a similar model for sending teams of medical personnel. However, there is a need for additional efforts to facilitate the receipt of MCMs and personnel from partner countries.

2016 JEE Recommendations from the External Evaluators

1. Develop a companion framework to the International Assistance System that will describe the roles, responsibilities, and processes that HHS will use to manage international offers of public health and medical assistance including medical teams.
2. Work with international partners to improve cross-border deployment capabilities by supporting the development of global emergency regulatory mechanisms and developing checklists, operational plans, and other tools to support the development of emergency medical teams, facilitating their deployment and improving coordination.

Summary of Action Items

Efforts will focus on improving the federal government's ability to request, send, and receive MCMs and health personnel from international partners during a public health emergency. This will include developing a policy framework and corresponding operational plans to receive MCMs and public health and medical personnel from foreign countries during a major public health or medical emergency in the United States. The development of an internal policy framework to describe the roles, responsibilities, and processes within HHS during a public health emergency at the national-international interface will further support these efforts. In addition, there will be efforts to work bilaterally and multilaterally to develop and test new tools for addressing legal, regulatory, and

logistical challenges to cross-border deployments of public health and medical personnel and to support initiatives to standardize and further professionalize international public health and medical response practices such as the WHO Emergency Medical Teams Initiative and the regional efforts of Pan American Health Organization (PAHO).

Action Items

Table 42. JEE RECOMMENDATION 1 (JEE INDICATORS R.4.1 and R.4.2): *Develop a companion framework to the International Assistance System that will describe the roles, responsibilities, and processes that HHS will use to manage international offers of public health and medical assistance including medical teams.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS, HHS	Finalize the internal HHS policy framework as a companion to the International Assistance System and corresponding operating procedures that describe how the Department will make requests for, or manage offers of, public health and medical assistance from foreign partners.	FEMA, ASPR, CDC, FDA, OGC
2018	DHS, HHS	Circulate for interagency review and comment a draft internal policy framework to enhance ASPR's coordination during an event at the national-international interface.	ASPR
2019	DHS, HHS	Exercise the internal HHS policy framework and corresponding operating procedures for how the Department will make requests for international assistance, or manage offers of, public health and medical assistance from foreign partners.	FEMA, ASPR, CDC, FDA
2019	DHS, HHS	Incorporate lessons learned from the exercise into the internal HHS framework that describes how the Department will make requests for, or manage offers of, public health and medical assistance from foreign partners.	FEMA, ASPR, FDA
2019	HHS	Finalize and obtain clearance from interagency and senior federal government leadership of the internal HHS policy framework to enhance ASPR's coordination during an event at the national-international interface.	ASPR

Table 43. JEE RECOMMENDATION 2 (JEE INDICATORS R.4.1 and R.4.2): *Work with international partners to improve cross-border deployment capabilities by supporting the development of global emergency regulatory mechanisms and developing checklists, operational plans, and other tools to support the development of emergency medical teams, facilitating their deployment and improving coordination.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Support PAHO efforts to implement the regional implementation of the WHO Emergency Medical Teams Initiative.	ASPR

Table 44. OTHER ACTIVITIES (JEE INDICATOR R.4.1)

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	DHS, HHS	Plan and participate in an exercise that includes testing capabilities to send, and/or receive, MCMs across international borders in collaboration with federal government stakeholders.	FEMA, ASPR, CDC, FDA, OGC
2019	HHS	Identify the specific liability concerns, by stakeholder type, related to the transport, distribution, and dispensing/administration of unapproved MCMs imported from foreign sources to assess their impact on the rapid response to public health emergencies.	FEMA, ASPR, CDC, FDA, OGC
2020	DHS, HHS	Identify existing HHS/FDA medical product access mechanisms for transporting, distributing, and dispensing/administering unapproved medical products imported from foreign sources during a public health emergency.	FEMA, ASPR, CDC, FDA, OGC
2020	DHS, HHS	Review and revise the federal government policies and procedures, as needed, based on the results of the exercise that includes testing capabilities to send and/or receive MCMs across international borders.	FEMA, ASPR, CDC, FDA, OGC

RESPOND 5 — Risk Communication

JEE Target

States Parties should have a risk communication capacity that is multi-level and multi-faced; utilizes real time exchange of information; and employs advice and opinion between experts and officials or people who face a threat or hazard to their survival, health, economic, or social well-being so that they can make informed decisions that mitigate the effects of the threat or hazard and take protective and preventive action. It includes a mix of communication and engagement strategies such as media and social media communication, mass awareness campaigns, health promotion, social mobilization, and stakeholder and community engagement.

Indicators

R5.1 *Risk communication systems (e.g., plans, mechanisms, etc.)*	**2016 Capacity Level: 4**
R5.2 *Internal and partner communication and coordination*	**2016 Capacity Level: 5**
R5.3 Public communication	**2016 Capacity Level: 4**
R5.4 *Communication engagement with affected communities*	**2016 Capacity Level: 3**
R5.5 *Dynamic listening and rumor management*	**2016 Capacity Level: 4**

Summary of U.S. Self-Assessment

The United States has an effective system for developing risk communications at the federal level that involves all of the key departments and agencies. However, during the earliest stages of a response, various departments and agencies may conduct communication operations more independently and less cohesively. There are not enough personnel trained in handling major emergencies, with too few who can surge where and when needed.

2016 JEE Recommendations from the External Evaluators

1. Strengthen risk communication in professional disciplines with the help of increased resources for training and encourage professional peer-review publishing on the topic by practitioners.
2. Ensure adequate numbers of risk communication specialists are trained for a possible radiological (or other rare) event.

3. Evaluate existing risk communication staffing models and develop options for surge capacity.
4. Increase resources for real-time population knowledge and beliefs to adjust behavior change messages.

Summary of Action Items

Efforts will focus on promoting community engagement and evaluating the current capacities and challenges among SLTT partners, and working with them to develop training and staffing plans to improve the number of qualified risk communicators. Action items will include training around complex situations and specific (rare) hazards; surveying national risk communication partners and media outlets to develop a plan to address existing gaps and shortfalls in community engagement and readiness; and conducting exercises to test those plans.

Action Items

Table 45. JEE RECOMMENDATION 1 (JEE INDICATORS R.5.1 and R.5.3): *Strengthen risk communication in professional disciplines with the help of increased resources for training and encourage professional peer-review publishing on the topic by practitioners.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Partner with local and non-government organizations to publish literature related to public health emergency community engagement and risk communication.	CDC
2019	HHS	Develop a plan to train public health communication professionals on emergency risk communication.	ASPA, ASPR, CDC
2019	HHS	Develop a plan to train SLTT and federal jurisdiction leaders who may be involved in complex public emergencies on crisis leadership and emergency risk communication.	ASPA, ASPR, CDC
2019	HHS	Develop a plan that improves the scope and consistency across SLTT and federal jurisdictions to offer plain language health advice across diverse media, as well as sector-specific health advice phrased in terminology appropriate to the sector.	ASPA, ASPR, CDC
2020	HHS	Implement plans to routinely assess and evaluate public communications for complex situations.	ASPA, ASPR, CDC
2020	HHS	Conduct full-scale exercises that test rural and urban jurisdictions for complex and rare hazards, including public communications and emergency risk communications aspects of same.	ASPA, ASPR, CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS	Train public health communication professionals on emergency risk communication.	ASPA, ASPR, CDC
2020	HHS	Train SLTT and federal jurisdiction leaders who potentially may be involved in complex public emergencies on crisis leadership and emergency risk communication.	ASPA, ASPR, CDC

Table 46. JEE RECOMMENDATION 2 (JEE INDICATOR R.5.1): *Ensure adequate numbers of risk communication specialists are trained for a possible radiological (or other rare) event.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOE, EPA, NRC	Continue to lead the interagency Nuclear/Radiological Communications Working Group in charge of developing products and plans for radiological risk communications that might be helpful during an emergency.	DOE, EPA, NRC

Table 47. JEE RECOMMENDATION 3 (JEE INDICATOR R.5.1): *Evaluate existing risk communication staffing models and develop options for surge capacity.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Review current crisis and emergency risk communication personnel capacity across SLTT and federal jurisdictions and hazards for critical gaps.	CDC
2018	HHS	Consult with multiple jurisdictions on an approach for the risk communication personnel capacity needs assessment.	CDC
2019	HHS	Conduct a needs assessment for minimum required emergency risk communication capacity across SLTT and federal jurisdictions for complex situations including nuclear/radiological threats.	CDC
2019	HHS	Conduct and publish the results of a needs assessment for minimum required emergency risk communication capacity among leaders.	CDC

Table 48. JEE RECOMMENDATION 4 (JEE INDICATOR R.5.5): *Increase resources for real-time population knowledge and beliefs to adjust behavior change messages.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Develop a survey with national public health partners and media to determine the level of collaboration in providing health advice and managing misinformation during events.	CDC
2018	HHS	Conduct a needs assessment on community engagement capacity in rural and urban settings.	CDC
2019	HHS	Develop a practitioner's handbook on community engagement that focuses on local responses for all-hazards.	CDC
2019	HHS	Include community engagement best practices as a core module of crisis and emergency risk communication curriculum and training.	CDC
2019	HHS	Conduct pre- and post-conference workshops on risk communication and community engagement and standing public health and emergency response conferences and meetings.	CDC
2020	HHS	Survey community members to assess the extent to which they perceive themselves as equal partners in the risk communication process.	CDC
2020	HHS	Conduct exercises or show through real health emergencies that communities are equal partners and that community engagement happens before, during, and after health emergencies.	CDC

Table 49. OTHER ACTIVITIES (JEE INDICATORS R.5.1 and R.5.2)

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Constitute an interagency group to oversee risk communication planning and evaluation.	ASPA, ASPR, CDC

OTHER IHR HAZARDS — Points of Entry (PoE)

JEE Target

States Parties should designate and maintain the core capacities at international airports and ports (and where justified for public health reasons, a State Party may designate ground crossings), which implement specific public health measures required to manage a variety of public health risks.

Indicators

PoE.1 *Routine capacities are established at PoE* **2016 Capacity Level: 4**

PoE.2 *Effective public health response at PoE* **2016 Capacity Level: 5**

Summary of U.S. Self-Assessment

The United States has strong systems in place at international points of entry (PoE) designated for IHR purposes, but there is a large variance in preparedness for public health emergencies at many other international ports (mostly airports).

2016 JEE Recommendations from the External Evaluators

1. Development of a comprehensive national aviation preparedness plan aimed at preventing and containing the spread of diseases, which would include PoE not already covered by the CDC.
2. Expansion of capacity to detect, assess, report, and respond at non-designated ports supported by exercise programs.
3. Provisioning of on-site access to specialized public health officers at non-designated ports (ground, sea, and air).

Summary of Action Items

Given the complexity of federal, state, and local government jurisdiction and authority over components of civil aviation (including public health and safety), and the responsibilities of SLTT authorities and private companies to maintain public health emergency plans, the federal government will develop guidelines for public health preparedness at international PoEs. The national guidelines will include a catalog of complementary resources and templates (where appropriate) to assist with planning. Ultimately, the efforts will evaluate the effectiveness of those guidelines through existing mechanisms at the federal level to determine the need for additional information, research, and resources.

Action Items

Table 50. JEE RECOMMENDATION 1 (JEE INDICATOR PoE.2): *Development of a comprehensive national aviation preparedness plan aimed at preventing and containing the spread of diseases, which would include PoE not already covered by the CDC;* and **JEE RECOMMENDATION 2 (JEE INDICATOR PoE.1):** *Expansion of capacity to detect, assess, report, and respond at non-designated ports supported by exercise programs;* **JEE RECOMMENDATION 3 (JEE INDICATOR PoE.1):** *Provisioning of on-site access to specialized public health officers at non-designated ports (ground, sea, and air)*.

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS, DOT, HHS	Complete a white paper describing the functions of the HHS/CDC Quarantine Stations in covering the international PoE and the current federal government approach to public health emergency preparedness in civil aviation.	CBP, FAA, CDC
2018	DHS, DOT, HHS	Conduct a comprehensive review of the existing national and international guidelines and mechanisms for establishing aviation public health emergency plans.	CBP, FAA, CDC
2018	DHS, DOT, HHS	Update and draft, as needed, guidelines for communicable disease response plans and other public health emergency preparedness strategies for non-IHR-designated international airports.	CBP, FAA, CDC
2018	DHS, HHS	Develop and pilot a “public health preparedness dashboard” to facilitate awareness of overall preparedness at PoE, which can initially be used among the airports with quarantine stations.	CBP, CDC
2019	DHS, DOT, HHS	Finalize and publish guidelines and performance benchmarks for state and local officials (and others involved in the aviation industry) to use to increase public health emergency preparedness at international airports.	CBP, ASPR, CDC
2019	DHS, DOT, HHS	Assist individual airport operators to devise and (if feasible) exercise their public health emergency plans.	CBP, FAA, ASPR, CDC
2019	DHS, HHS	Determine the feasibility of expanding the public health preparedness dashboard to more airports.	CBP, ASPR, CDC
2020	DHS, DOT, HHS	Assist individual airport operators to devise and (if feasible) exercise their public health emergency plans.	CBP, FAA, ASPR, CDC
2020	DHS, DOT, HHS	Determine the feasibility of expanding the online public health preparedness dashboard to include all airports.	CBP, FAA, ASPR, CDC

OTHER IHR HAZARDS — Chemical Events

JEE Target

States Parties should have surveillance and response capacity for chemical risk or events. This requires effective communication and collaboration among the sectors responsible for chemical safety, industries, transportation, and safe disposal.

Indicators

CE.1 *Mechanisms are established and functioning for detecting and responding to chemical events or emergencies*	**2016 Capacity Level: 4**
CE.2 *Enabling environment is in place for management of chemical events*	**2016 Capacity Level: 5**

Summary of U.S. Self-Assessment

The United States has an adequate system in place to identify chemical events quickly. However, local laboratories and health departments require improvements in their capacity for rapid risk assessments and diagnostics.

2016 JEE Recommendations from the External Evaluators

1. Follow up and evaluate implementation of the Federal Interagency Working Group Action Plan issued in 2014.
2. Improve the capacity for recovery and resiliency with respect to chemical response by reducing variations between states' capacities.
3. Expand the number of the trained personnel who can manage larger-scale emergencies.

Summary of Action Items

Efforts will focus on federal government departments and agencies developing additional guidance for preparedness at the SLTT level, and developing and stockpiling improved MCMs for chemical exposures; expanding the number of laboratories in the ERLN; evaluating the variations in SLTT capacities; and developing tools to assist them in reviewing and improving their local capacities to provide a medical response to a large-scale chemical event.

Action Items

Table 51. JEE RECOMMENDATION 1 (JEE INDICATOR CE.2): *Follow up and evaluate implementation of the Federal Interagency Working Group Action Plan issued in 2014.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	EPA	Leverage improved communication and coordination with the federal and regional working group (EPA, DHS, DOL/OSHA, and DOJ/ATF) resulting from the successful implementation of the "Executive Order 13650: Actions to Improve Chemical Facility Safety and Security – A Shared Commitment | Report for the President (May 2014)," which was developed and implemented as a result of Executive Order 13650: Improving Chemical Facility Safety and Security.	EPA
2018	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, HHS/ASPR, HHS/CDC, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA
2018	EPA	Continue the open solicitation to public and private laboratories for membership in the ERLN.	EPA
2018	EPA	Develop methods for detection of chemical threats in environmental matrices to support the ERLN.	EPA
2018	EPA	Conduct decontamination studies for chemical agents on surfaces including material compatibility studies.	EPA
2018	EPA	Evaluate waste treatment technologies for Chemical Warfare Agents (CWA) contaminated building materials.	EPA
2018	EPA	Conduct demonstrations of decontaminating drinking water systems and household plumbing/appliances from contamination at the Water Security Test Bed at DOE's Idaho National Laboratory.	EPA
2018	HHS	Continue to maintain and update information and training resources for emergency preparedness and response.	NIH
2019	EPA	Leverage improved communication and coordination with the federal and regional working group (EPA, DHS, DOL/OSHA, and DOJ/ATF) resulting from the successful implementation of the "Executive Order 13650: Actions to Improve Chemical Facility Safety and Security – A Shared Commitment | Report for the President (May 2014)," which was developed and implemented as a result of Executive Order 13650: Improving Chemical Facility Safety and Security.	EPA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, HHS/ASPR, HHS/CDC, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA
2019	EPA	Continue the open solicitation to public and private laboratories for membership the ERLN.	EPA
2019	EPA	Continue to develop methods for detection of chemical threats in environmental matrices to support the ERLN.	EPA
2019	EPA	Continue to conduct decontamination studies for chemical agents on surfaces including material compatibility studies.	EPA
2019	EPA	Continue to evaluate waste treatment technologies for CWA contaminated building materials.	EPA
2019	EPA	Conduct demonstrations of decontaminating drinking water systems and household plumbing/appliances from contamination at the Water Security Test Bed at DOE's Idaho National Laboratory.	EPA
2019	HHS	Continue to maintain and update information and training resources for emergency preparedness and response.	NIH
2020	EPA	Leverage improved communication and coordination with the federal and regional working group (EPA, DHS, DOL/OSHA, and DOJ/ATF) resulting from the successful implementation of the "Executive Order 13650: Actions to Improve Chemical Facility Safety and Security – A Shared Commitment | Report for the President (May 2014)," which was developed and implemented as a result of Executive Order 13650: Improving Chemical Facility Safety and Security.	EPA
2020	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, HHS/ASPR, HHS/CDC, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA
2020	EPA	Continue the open solicitation to public and private laboratories for membership in the ERLN.	EPA
2020	EPA	Continue to develop methods for detection of chemical threats in environmental matrices to support the ERLN.	EPA
2020	EPA	Continue to conduct decontamination studies for chemical agents on surfaces including material compatibility studies.	EPA
2020	EPA	Continue to evaluate waste treatment technologies for CWA contaminated building materials.	EPA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	HHS	Continue to maintain and update information and training resources for emergency preparedness and response.	NIH

Table 52. JEE RECOMMENDATION 2 (JEE INDICATOR CE.1): *Improve the capacity for recovery and resiliency with respect to chemical response by reducing variations between states' capacities.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS, HHS	Publish implementation action steps for mass patient decontamination based on "Patient Decontamination in a Mass Chemical Exposure Incident: National Planning Guidance for Communities," published in 2014.	DHS, ASPR
2018	EPA	Leverage improved communication and coordination with the federal and regional working group (EPA, DHS, DOL/OSHA and DOJ/ Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF)) resulting from the successful implementation of the "Executive Order 13650: Actions to Improve Chemical Facility Safety and Security – A Shared Commitment | Report for the President (May 2014)," which was developed and implemented as a result of Executive Order 13650: Improving Chemical Facility Safety and Security.	EPA
2018	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, HHS/ASPR, HHS/CDC, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA
2018	EPA	Continue the open solicitation to public and private laboratories for membership in the ERLN.	EPA
2018	HHS	Research, develop, and stockpile new and improved MCMs for CWA, such as nerve agents, sulfur mustard, cyanide, chlorine, and toxic industrial chemicals.	ASPR, CDC, FDA, NIH
2018	HHS	Refine, promote and continue training and integration into response novel responder guidance and decision support tools, such as CHEMM, WISER, PRISM, and DERMaL eToolkit.	ASPR, CDC, NIH
2019	DHS, HHS	Develop guidance for local communities on MCM optimization and contingency MCM use during a mass casualty chemical incident.	DHS, ASPR, CDC

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	EPA	Leverage improved communication and coordination with the federal and regional working group (EPA, DHS, DOL/OSHA, and DOJ/ATF) resulting from the successful implementation of the "Executive Order 13650: Actions to Improve Chemical Facility Safety and Security – A Shared Commitment | Report for the President (May 2014)," which was developed and implemented as a result of Executive Order 13650: Improving Chemical Facility Safety and Security.	EPA
2019	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, HHS/ASPR, HHS/CDC, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA
2019	EPA	Continue the open solicitation to public and private laboratories for membership in the ERLN.	EPA
2019	HHS	Research, develop, and stockpile new and improved MCMs for CWA, such as nerve agents, sulfur mustard, cyanide, chlorine, and toxic industrial chemicals.	ASPR, CDC, FDA, NIH
2019	HHS	Continue to refine, promote, train, and integrate into response novel responder guidance and decision support tools, such as CHEMM, WISER, PRISM, and DERMaL eToolkit.	ASPR, CDC, NIH
2020	EPA	Leverage improved communication and coordination with the federal and regional working group (EPA, DHS, DOL/OSHA, and DOJ/ATF) resulting from the successful implementation of the Report for the President: Actions to Improve Chemical Facility Safety and Security – A Shared Commitment (May 2014)," which was developed and implemented as a result of Executive Order 13650: Improving Chemical Facility Safety and Security.	EPA
2020	EPA	Participate in CBRN-related training and exercises with EPA regions and national special teams, federal partners (DHS, DHS/FEMA, HHS/ASPR, HHS/CDC, USCG, etc.), and SLTT partners regarding response activities involving CBRN agents.	EPA
2020	EPA	Continue the open solicitation to public and private laboratories for membership in the ERLN.	EPA
2020	HHS	Research, develop, and stockpile new and improved MCMs for CWA, such as nerve agents, sulfur mustard, cyanide, chlorine, and toxic industrial chemicals.	ASPR, CDC, FDA, NIH
2020	HHS	Continue to refine, promote, train, and integrate into response novel responder guidance and decision support tools, such as CHEMM, WISER, PRISM, and DERMaL eToolkit.	ASPR, CDC, NIH

Table 53. JEE RECOMMENDATION 3 (JEE INDICATOR CE.2): *Expand the number of the trained personnel who can manage larger-scale emergencies.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS, HHS	Update training curricula as new guidance on MCM optimization, contingency MCM use, patient decontamination, and others are available.	FEMA, CMWD, ASPR, CDC, NIH
2018	DHS, HHS	Train personnel on risk assessment, medical challenges, decision-making, and other critical issues during the first four hours of a response.	FEMA, CWMD, ASPR, NIH
2018	HHS	Publish research results and practical guidance from a pre-hospital mass patient decontamination research project.	ASPR
2019	DHS, HHS	Update training curricula as new guidance on MCM optimization, contingency MCM use, patient decontamination, and others are available.	FEMA, CWMD, ASPR, CDC, NIH
2019	DHS, HHS	Train personnel on risk assessment, medical challenges, decision-making, and other critical issues during the first four hours of a response.	FEMA, CWMD, ASPR, NIH
2019	HHS	Publish national planning guidance on decontaminating pediatric and pregnant patients.	ASPR
2020	DHS, HHS	Update training curricula as new guidance on MCM optimization, contingency MCM use, patient decontamination, and others are available.	FEMA, CWMD, ASPR, CDC, NIH
2020	DHS, HHS	Train personnel on risk assessment, medical challenges, decision-making, and other critical issues during the first four hours of a response.	FEMA, CWMD, ASPR, NIH

OTHER IHR HAZARDS — Radiation Emergencies

JEE Target

States Parties should have surveillance and response capacity for radio-nuclear hazards/events/emergencies. This requires effective communication and collaboration among the sectors responsible for radio-nuclear management.

Indicators

RE.1 *Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies*	**2016 Capacity Level: 3**
RE.2 *Enabling environment is in place for management of radiation emergencies*	**2016 Capacity Level: 3**

Summary of U.S. Self-Assessment

While early radiation detection is generally available across the country, few locations have the ability to assess dose and conduct post-event risk assessments.

2016 JEE Recommendations from the External Evaluators

1. Establish mechanisms for systematic information exchange between authorities of the radiological competent and human health service surveillance unit.
2. Develop a long-term waste management repository following the cleanup of a radiological spill.
3. Research, develop, and implement systems to create novel, high-throughput systems that are capable of performing biodosimetry and bioassay in both mass casualty and large-scale radionuclide dispersion situations.
4. Implement the recommendations in the report “Where are the radiation professionals?” (Statement No. 12) issued by the National Council on Radiation Protection and Measurements in 2015.
5. Integrate triage systems and population monitoring guidance with the existing national public health and clinical systems in order to provide a national capacity for continuity of assessment, care, and treatment.

Summary of Action Items

Efforts will focus on developing laboratory bioassays for the remaining priority radionuclides and disseminating the tests to designated labs across the country (funding dependent); increasing the overall capacity to conduct radiobiodosimetry testing including characterization and validation of new methods; collaborating with U.S. hospitals to identify locations that could potentially adopt standardized biodosimetry methods and coordinate to enable responses to larger-scale exposures; increase number of radiation professionals through education, work experience, and increasing awareness of the profession; and collaborating with SLTT health departments/PHEP grant awardees to raise awareness of their potential role in a radiation emergency response, to provide them with guidance on emergency response preparations, and to enhance situational awareness between partners in a radiological response.

Action Items

Table 54. JEE RECOMMENDATION 1 (JEE INDICATOR RE.1): *Establish mechanisms for systematic information exchange between authorities of the radiological competent and human health service surveillance unit.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	DHS, DOE, HHS	Improve situational awareness among SLTT and federal partners during a radiological incident through exercises that focus on secure information exchange technology, predetermination of data needs, exercising the exchange of data in both directions, and working with all partners that will require data to ensure minimal impact on the provider of data.	DHS, DOE, CDC
2019	DHS, HHS	Conduct a thorough capabilities analysis and develop specific guidance for the resources necessary to conduct large-scale triage, early patient assessment, screening, and decontamination prior to and during early evacuation phases for a major nuclear detonation requiring population movement and evacuation.	DHS, ASPR, CDC
2019	HHS	Develop a framework and plans to incorporate mass casualty triage into an Integrated Clinical Diagnostics System (ICDS) for biodosimetry surge to assess radiation injury. The ICDS is a framework that includes massive surge for hematology (lymphocyte depletion kinetics via complete blood count and white blood cell differential analysis, DCA, radiobioassay, and novel point-of-care and high-throughput dosimetry currently under development).	ASPR

Table 55. JEE RECOMMENDATION 2 (JEE INDICATOR RE.2): *Develop a long-term waste management repository following the cleanup of a radiological spill.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOE, EPA	Develop methods for rapid survey of radiologically contaminated areas.	NNSA, EPA
2018	DOE, EPA	Evaluate the fate and transport of radiological threats to inform environmental response and remediation and report the results.	NNSA, EPA
2018	DOE, EPA	Develop methods for owner/occupant decontamination of radiological contaminated residences and businesses.	NNSA, EPA
2018	DOE, EPA	Further develop decision-support tools for environmental response and remediation including transport of waste.	NNSA, EPA
2018	EPA	Develop methods for management of contaminated water.	EPA
2019	DOE, EPA	Continue to develop methods for rapid survey of radiologically contaminated areas.	NNSA, EPA
2019	DOE, EPA	Continue to develop methods for owner/occupant decontamination of radiological contaminated residences and businesses.	NNSA, EPA
2019	DOE, EPA	Continue to develop methods for management of contaminated water.	NNSA, EPA
2019	DOE, EPA	Continue to further develop decision-support tools for environmental response and remediation including transport of waste.	NNSA, EPA
2019	DOE, EPA	Develop a comprehensive wide-area radiological response strategy with recommendations for radiological assessment, mitigation, and environmental cleanup. Waste management is a critical element of radiological cleanup. The strategy will include recommendations for management and disposal of radiologically contaminated soils and other wastes.	NNSA, EPA
2019	DOE, EPA	Continue to develop methods for rapid survey of radiologically contaminated areas.	NNSA, EPA
2019	DOE, EPA	Continue to develop methods for owner/occupant decontamination of radiological contaminated residences and businesses.	NNSA, EPA
2019	DOE, EPA	Continue to develop methods for management of contaminated water.	NNSA, EPA
2019	DOE, EPA	Continue to further develop decision-support tools for environmental response and remediation including transport of waste.	NNSA, EPA
2019	DOE, EPA	Develop a comprehensive wide-area radiological response strategy with recommendations for radiological assessment, mitigation, and environmental cleanup. Waste management is a critical element of radiological cleanup. The strategy will include recommendations for management and disposal of radiologically contaminated soils and other wastes.	NNSA, EPA
2020	DOE, EPA	Continue to develop methods for rapid survey of radiologically contaminated areas.	NNSA, EPA

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2020	DOE, EPA	Continue to develop methods for owner/occupant decontamination of radiological contaminated residences and businesses.	NNSA, EPA
2020	DOE, EPA	Continue to further develop decision-support tools for environmental response and remediation including transport of waste.	NNSA, EPA

***NOTE**: Successful implementation of this recommendation is dependent on a significant number of activities performed in advance of an actual incident in order to be prepared for such an event.*

Table 56. JEE RECOMMENDATION 3 (JEE INDICATOR RE.1): *Research, develop, and implement systems to create novel, high-throughput systems that are capable of performing biodosimetry and bioassay in both mass casualty and large-scale radionuclide dispersion situations*.

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DoD	Validate the DoD requirement for biodosimetry support under the National Response Framework, Nuclear/Radiological Incident Annex.	DoD
2018	DoD	Brief DHA and/or ASDHA on reports prepared for the U.S. Army Public Health Command per Delivery Order Number 0750, CBRNIAC Task Number CB-12-0356, "DoD Biodosimetry Project: Recommendations for Advanced Biodosimetry Modalities" and "DoD Biodosimetry Project: Operational Aspects of a DoD Advanced Biodosimetry System;" and obtain decision as to whether to proceed with formally establishing a biodosimetry capability/network within the DoD and, if decision is to proceed, which presented course of action to pursue (further actions that are listed for this and the following years are dependent on an affirmative decision to proceed).	DoD
2018	DoD	Establish DoD Biodosimetry Center and Network with initial capabilities in executive, data management, logistics, laboratory, and regulatory functions, as resources allow, pending completion of funding authority.	DoD
2018	DoD	Establish and validate initial throughput capacity currently existing in DoD for three techniques: dicentric chromosome analysis (DCA), Whole Body Counting, and, when FDA-cleared/approved, Electron Paramagnetic Resonance (EPR).	DoD
2018	DoD	Validate emerging biodosimetry methods and establish initial DoD capacity.	DoD
2018	DOE	Fully automate metaphase scoring using the DCA in the Cytogenetic Biodosimetry Laboratory (CBL) at the Radiation Emergency Assistance Center/Training Site (REAC/TS) and revise the SOPs.	DOE

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DOE	Identify and initiate preliminary contacts with all sites in the United States with an operating Metafer slide-scanning platform.	DOE
2018	DOE	Implement the revised REAC/TS SOP and common calibration curves for DCA and provide technical cross-training for an additional CBL.	DOE
2018	DOE	Fully characterize the pseudo-Pelger Huët Anomaly (PHA) as a new biodosimeter.	DOE
2018	DOE	Explore feasibility of leveraging Metafer slide-scanning platform located at U.S. hospitals and commercial laboratories for DCA.	DOE
2018	HHS	Continue support of advanced development of biodosimetry methods and devices (including high-throughput image assessment of cytogenetic changes and micro-RNA based point-of-care triage devices).	ASPR, FDA, NIH
2018	HHS	Develop rapid bioassay methods for Ra-226, Po-210, Th-232, and Np-237.	CDC
2018	HHS	Develop a bioassay surge capacity deployment plan for the priority threat radionuclides.	CDC
2018	HHS	Develop a five-year spend plan for bioassay surge capacity.	CDC
2018	HHS	Identify all of the instrumentation and small equipment needs, validation requirements, proficiency testing needs, and data exchange criteria for a bioassay surge capacity.	CDC
2018	HHS	Facilitate the collaboration of HHS/CDC radiation health physics staff and HHS/CDC radiobioassay laboratory to ensure the capability to interpret laboratory data and rapidly produce dose estimates for large population groups.	CDC
2018	HHS	Fund early research and development of novel biodosimetry methods and biomarker identification through inter- and intra-agency agreements.	NIH
2018	HHS	Fund research for identification of biomarkers of radiation injury to use as the basis for triage and injury assessment.	NIH
2018	HHS	Provide funding and guidance to universities developing surge-capacity, cytogenetics assays, and devices capable of screening large numbers of potentially radiation-exposed individuals.	NIH
2018	HHS	Fund research for identifying biomarkers of acute radiation exposure that are predictive of organ-specific injuries and late effects, allowing for effective use of scarce medical management resources post-incident.	NIH
2018	HHS	Provide biological samples for validations of methods and biomarkers.	NIH
2019	DoD	Exercise DoD biodosimetry support to domestic incident response under the National Response Framework, Nuclear/Radiological Incident Annex.	DoD

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	DoD	Establish DoD Biodosimetry Center and Network interoperability with DOE network, as resources allow.	DoD
2019	DOE	Increase throughput at REAC/TS CBL through implementation of commercially available platforms for automated sample processing and use SOPs and common calibration curves with a U.S. CBL to reduce inter-laboratory variation.	DOE
2019	DOE	Validate accuracy of PHA versus DCA.	DOE
2019	DOE	Explore integration of DCA with EPR and radio bioassays using the National Analytical Management Program.	DOE
2019	DOE	Fully automate micronuclei assay.	DOE
2019	DOE	Develop MOUs with hospitals and commercial laboratories for Metafer use for meeting the surge capacity based on outcomes from FY 2018.	DOE
2019	HHS	Continue support of advanced development of biodosimetry methods and devices (including high-throughput image assessment of cytogenetic changes and micro-RNA based point-of-care triage devices).	ASPR, CDC, NIH
2019	HHS	Develop rapid bioassay methods for Cm-244, I-131, and I-125.	CDC
2019	HHS	Automate the pre-analytical component of the Sr-90, Am-214 analytical methods.	CDC
2019	HHS	Develop a technology transfer program for bioassay surge capacity (funding dependent).	CDC
2019	HHS	Develop a performance testing program for the bioassay surge capacity (funding dependent).	CDC
2019	HHS	Demonstrate through exercise or drill HHS/CDC radiobioassay laboratory coordination with HHS/CDC radiation health physics staff to ensure capability of dose assessment.	CDC
2019	HHS	Continue funding early research and development of novel biodosimetry methods and biomarker identification through inter- and intra-agency agreements.	NIH
2019	HHS	Continue providing funding for identification of biomarkers of radiation injury to use as the basis for triage and injury assessment.	NIH
2019	HHS	Continue providing funding and guidance to universities developing surge-capacity, cytogenetics assays and devices capable of screening large numbers of potentially-radiation exposed individuals.	NIH
2019	HHS	Continue providing funding for identifying biomarkers of acute radiation exposure that are predictive of organ-specific injuries and late effects, allowing for effective use of scarce medical management resources post-incident.	NIH

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	HHS	Continue providing biological samples for validations of methods and biomarkers.	NIH
2020	HHS	Continue support of advanced development of biodosimetry methods and devices (including high-throughput image assessment of cytogenetic changes and micro-RNA based point-of-care triage devices).	ASPR, CDC, NIH
2020	HHS	Develop rapid bioassay methods for Cf-252 and Se-75.	CDC
2020	HHS	Validate the laboratory test set for bioassay surge capacity, assessing analytical levels of detail, linear range validation, inter-instrument comparisons, sample receipt, analysis and reporting, and Clinical Laboratory Improvement Amendments compliance (funding dependent).	CDC
2020	HHS	Challenge the deployable bioassay surge capacity four times per year with performance testing samples (funding dependent).	CDC
2020	HHS	Demonstrate capacity of HHS/CDC radiobioassay laboratory (lead), HHS/CDC radiation health physics staff, and SLTT assets to coordinate laboratory samples, data, and dose estimates through exercise or drill.	CDC
2020	HHS	Continue funding early research and development of novel biodosimetry methods and biomarker identification through inter- and intra-agency agreements.	NIH
2020	HHS	Continue providing funding for identification of biomarkers of radiation injury to use as the basis for triage and injury assessment.	NIH
2020	HHS	Continue providing funding and guidance to universities developing surge-capacity, cytogenetics assays and devices capable of screening large numbers of potentially-radiation exposed individuals.	NIH
2020	HHS	Continue providing funding for identifying biomarkers of acute radiation exposure that are predictive of organ-specific injuries and late effects, allowing for effective use of scarce medical management resources post-incident.	NIH
2020	HHS	Continue providing biological samples for validations of methods and biomarkers.	NIH

Table 57. JEE RECOMMENDATION 4 (JEE INDICATOR RE.2): *Implement the recommendations in the report "Where are the radiation professionals?" (Statement No. 12) issued by the National Council on Radiation Protection and Measurements in 2015.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	HHS	Provide radiation-related training/mentoring to undergraduates, graduate students, and current public health workforce through collaboration with universities and cooperative agreements to build baseline expertise to support ongoing radiation-related work and staff an IMS Structure to support a radiation-related response.	CDC
2018	HHS	Provide training and mentoring to undergraduates, graduate students, and post-doctoral fellows in the area of radiation biology to better prepare and staff a workforce with expertise in radiation injuries.	NIH
2018	HHS	Provide travel funding for undergraduates, graduate students, and post-doctoral fellows and training in radiation biology laboratories to attend both domestic and international meetings in order to present research findings.	NIH
2018	HHS	Make a valuable, free resource available to the wider scientific community through an online textbook, organized using HHS/NIH funding, and including chapter contributions from thought leaders in the fields of radiation biology, radiation chemistry, and radiation physics.	NIH
2018	HHS	Continue to maintain and update information and training resources for emergency preparedness and response.	NIH

Table 58. JEE RECOMMENDATION 5 (JEE INDICATOR RE.1): *Integrate triage systems and population monitoring guidance with the existing national public health and clinical systems in order to provide a national capacity for continuity of assessment, care, and treatment.*

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DoD, HHS	In partnership with private sector coalitions and organizations such as the NDMP's RITN: ▪ Grow network of response hospitals to expand capacity to care for patients with acute radiation syndrome (ARS). ▪ Continue to conduct regional tabletop exercises to engage major metropolitan areas to consider preparedness needs for the resulting medical surge from distant radiological disasters. ▪ Continue to fund hospitals to conduct full-scale and functional exercises for radiological incidents. ▪ Convene group of subject-matter experts to collate existing triage guidelines to produce a simple format to guide first receivers in their decisions for the care of ARS patients and administration of cytokines. ▪ Create just-in-time training for first receivers handling ARS patients in austere conditions before transportation to a higher level of care. ▪ Develop hematologic lab surge plan. ▪ Coordinate with public health partners to review radiological preparedness efforts and identify existing gaps in priority order for correction. ▪ Create training program (five courses) for public health preparedness staff that are inexperienced with radiological disasters	DoD, AHRQ, ASPR
2018	DOE, HHS	Validate emerging molecular platforms to assess individual biological dose.	DOE, ASPR
2018	HHS	Validate novel biomarkers of radiation injury to accurately assess radiation dose received and bridge from animals to humans.	NIH
2018	HHS	Provide funding for the development of devices and assays for potential incorporation into existing clinical laboratory testing programs.	NIH

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2019	DoD, HHS	In partnership with private sector coalitions and organizations such as the NDMP's RITN: ▪ Test through exercise the hematologic lab surge plan and publish template plan for use by preparedness community. ▪ Produce and publish triage guidelines to help first receivers in their decisions for the care of ARS patients and administration of cytokines. ▪ Fund the creation of a solution to one of the gaps identified by the public health radiological preparedness gap assessment. ▪ Conduct national-level patient movement exercise with key stakeholders to evaluate current plans associated with the movement of ARS patients to definitive care facilities following a radiological incident. ▪ Grow network of response hospitals to expand capacity to care for patients with ARS. ▪ Continue to conduct regional tabletop exercises to engage major metropolitan areas to consider preparedness needs for the resulting medical surge from distant radiological disasters. ▪ Continue to fund hospitals to conduct full-scale and functional exercises for radiological incidents.	DoD, AHRQ, ASPR
2020	DoD, HHS	In partnership with private sector coalitions and organizations such as the NDMP's RITN: ▪ Fund the creation of a solution to one of the gaps identified by the public health radiological preparedness gap assessment. ▪ Grow network of response hospitals to expand capacity to care for patients with ARS. ▪ Continue to conduct regional tabletop exercises to engage major metropolitan areas to consider preparedness needs for the resulting medical surge from distant radiological disasters. ▪ Continue to fund hospitals to conduct full-scale and functional exercises for radiological incidents. ▪ Develop telemedicine consultation process for distant bone marrow transplant/hematology/oncology communities to provide treatment advice to medical staff closer to the disaster.	DoD, AHRQ, ASPR

Table 59. OTHER ACTIVITIES (JEE INDICATOR RE.2)

CY	DEPARTMENTS	ACTION ITEMS	AGENCIES
2018	DHS	Conduct analysis of radiological policies, regulations, and operational capabilities through the FRPCC.	FEMA
2018	DHS, HHS	Hold NLE to test CONOPS at the national level and inform further development/enhancements.	DHS, ASPR
2018	HHS	Complete initial drafts of CONOPS at the national level, informed by 2017 NLE findings.	ASPR
2018	HHS	Raise awareness among PHEP grant awardees at the SLTT jurisdictions that they may be part of a receiving community for evacuees in a radiological emergency, and they should have some capability to monitor the population for radiation.	ASPR, CDC
2018	HHS	Further develop the criteria for the chemical, biological, radiological, nuclear, or high-yield explosive (CBRNE) Medical Operations Science Support Expert and their role by working with senior leadership for preparedness, planning, and response in collaboration with the Society of Disaster Medicine and Public Health.	ASPR, CDC, NIH
2019	DHS	Continue to conduct analysis of radiological policies, regulations, and operational capabilities through the FRPCC.	FEMA
2019	HHS	Improve SLTT radiation programs' access to funding and HHS/CDC guidance to use in enhancing ability to assess risks from and reduce radiation-related exposure/contamination through appropriate selection and use of hand-held and portable monitoring instrumentation.	CDC
2020	DHS	Continue to conduct analysis of radiological policies, regulations, and operational capabilities through the FRPCC.	FEMA
2020	HHS	Coordinate with SLTT health departments to exercise plans for population radiation exposure/contamination monitoring consistent with the NRIA and state preparedness plans.	CDC