

Joint External Evaluation of United States of America

Mission Report June 2016



**Alliance for Country
Assessment**

Table of Contents

Executive Summary – Findings from the Joint External Evaluation.....	2
USA Scores.....	5
PREVENT.....	8
National Legislation, Policy and Financing.....	8
IHR Coordination, Communication and Advocacy.....	10
Antimicrobial Resistance.....	12
Zoonotic Disease.....	15
Food Safety.....	18
Biosafety and Biosecurity.....	20
Immunization.....	22
DETECT.....	24
National Laboratory System.....	24
Real-Time Surveillance.....	28
Reporting.....	30
Workforce Development.....	33
RESPOND.....	36
Preparedness.....	36
Emergency Response Operations.....	39
Linking Public Health and Security Authorities.....	42
Medical Countermeasures and Personnel Deployment.....	44
Risk Communication.....	46
OTHER.....	51
Points of Entry.....	51
Chemical Events.....	54
Radiation Emergencies.....	57
Appendix 1: Joint External Evaluation Background.....	60

Executive Summary – Findings from the Joint External Evaluation

The report will be published on the following websites: <https://ghsagenda.org/assessments.html> and <https://extranet.who.int/donorportal/joint-external-evaluation-tool-assessment>.

The Global Health Security Agenda was launched two years ago to help build countries' capacity to create a world safe and secure from infectious disease and other threats. The GHSA external assessment tool was developed in collaboration with the key international organizations, GHSA steering group members and other partners. The tool and assessment process were piloted and further developed during six voluntary country assessments in three regions last year.

In early 2016, the WHO IHR monitoring and evaluation teams began working with the GHSA secretariat to introduce the Joint External Evaluation tool (JEE). The JEE tool includes the original 11 Action Packages of the GHSA tool but also adds in 8 other key technical areas from the IHR. As of February 2016, all GHSA external evaluations are being done using the JEE tool. The US is now the sixth country to undergo a voluntary JEE assessment, following on from Tanzania, Ethiopia, Mozambique, Pakistan and Bangladesh.

Consistent feedback from all assessed countries is that they have highly appreciated the process and the opportunity to bring together the different national stakeholders to discuss health security across One Health - in some cases for the first time. Most countries' administrations have the tradition of working in silos. Thus the GHSA-JEE country assessments have served as a strong catalyst for in-country coordination and networking, promoting the adoption and implementation of the One Health and whole-of-government, perhaps even a whole-of-society approach that has been addressed during the current assessment.

We have greatly appreciated the amount of work and time spent on preparing the excellent JEE self-evaluation document, and the open dialogue and collegial approach of working together with numerous national experts during our country visit. The outcome of the assessment was a highly collaborative process between representatives of the United States and the assessment team. Scoring of each technical area was conducted jointly between the US experts and the external assessors. As in previous assessments, this proved to be a very constructive pathway to identifying areas of current strengths and those areas that would benefit from strengthening.

The External Evaluation identified some clear overarching themes that were observed during this assessment:

Although a One Health approach is utilized and there is good collaboration between, and within state, government and other stakeholders, the US might benefit from developing a more formal One Health strategy that encompasses the federal, state and local levels.

The decentralization of the public health system, which includes human, animal, environment and other relevant health sectors, in the US brings considerable benefits in focusing and supporting public health action at the local level. However, it also brings challenges in ensuring consistent and coordinated action across the public health system from federal to state and local levels. The Assessment Team acknowledges the considerable efforts being made across the US system to maximize the benefits of decentralization while minimizing the risks, and would encourage the US to continue to reinforce and develop collaboration across all levels of the public health system to strengthen IHR core capacities

The assessment team agrees that, as reflected in the self-assessment report, the US has extensive and effective systems to reduce the risks and impacts of major public health emergencies, and actively participates in the global health security system established by the IHR. However, there are still, as always, areas for improvement. The country's geographic size and spread, economic and social diversity, and legal complexity require ongoing refinement of existing plans and interoperability of systems, for example, surveillance.

In regard to the U.S. laboratory system, while the networks are extensive and efficient, there is a need for better coverage in some parts of the country and overseas territories. There are areas that would benefit from improvements such as consistent levels of surveillance for antimicrobial resistance in more locations, including within the animal agriculture industry; more consistent support for rapid testing for food contaminants in all local jurisdictions; and a wider breadth of surveillance for dangerous pathogens (in general) in food production and importation. We acknowledge that efforts are underway to develop and expand the use of new technologies, such as whole genome sequencing.

A number of recent laboratory incidents involving the inappropriate handling of dangerous pathogens highlight the need for improvements in the national biosafety and biosecurity technical area, many of which are already underway. However, open reporting of these incidents underlines both the transparency of the US system and the exemplary risk communication strategy that the US has undertaken to build confidence and trust within the global health security community.

Attrition in senior level expertise across a range of core capacities should be addressed through a comprehensive strategy to encourage recruitment and retention of personnel. A qualified workforce is a critical foundation of a comprehensive strategy for public health security. The United States might benefit by developing a better understanding of the types, skills mix, and numbers of personnel needed in national and sub-national jurisdictions. The U.S. Government could consider options for developing public health workforce models that are adaptable to local circumstances, local risk assessments, and take into account the ability of some personnel to have multiple qualifications, and the need for various types of experts from relevant health sectors and specialists in different emergency situations.

The United States, like most countries, would be challenged to respond to a large-scale, catastrophic nuclear emergency. There would be benefit in developing improved collaboration and information sharing across the radiological and health sectors. As with other areas, loss of expertise in the future may become a challenge. Implementation of 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 would help address this.

Lastly, while the US is generally recognized as effective in delivering international support to global health security, maintaining such level of effectiveness over time to keep up with increasing emerging threats requires continuing political commitment and support. In addition, maintaining its international roles and participating in relevant international networks would contribute to the global public good that will reduce public health threats globally and to the US itself.

The assessment team would like to both note, and express its appreciation for, the considerable work and effort the US dedicated to this process – both the self- as well as the external assessment. The outstanding professionalism, transparency and willingness of our US hosts to work together with the external team to identify strengths and possible areas for further development were instrumental to the success of the mission.

On behalf of Finland as the GHSA Steering Group country responsible for the assessments and now head of the Alliance for Joint External Evaluations, we thank the US for its contribution in these initiatives, as well as for volunteering for a country assessment. We are also grateful to all the countries and key organizations that have sent experts to participate in this and the previous missions. It is a two way street, as the process has been a useful learning experience for the specialists involved in the assessment through exchange of information and best practices.

On behalf of the entire team of experts, it is our sincere hope that the US will find our report useful in further improving its Health Security.

Simo Nikkari (External Evaluation Team Lead)

USA Scores

Capacities	Indicators	Score
National Legislation, Policy and Financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR.	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 (2005)	5
IHR Coordination, Communication and Advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR.	5
Antimicrobial Resistance	P.3.1 Antimicrobial resistance (AMR) detection	4
	P.3.2 Surveillance of infections caused by AMR pathogens	4
	P.3.3 Healthcare associated infection (HCAI) prevention and control programs	4
	P.3.4 Antimicrobial stewardship activities	3
Zoonotic Disease	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	3
	P.4.2 Veterinary or Animal Health Workforce	4
	P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional	4
Food Safety	P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination.	4
Biosafety and Biosecurity	P.6.1 Whole-of-Government biosafety and biosecurity system is in place for human, animal, and agriculture facilities	4
	P.6.2 Biosafety and biosecurity training and practices	4
Immunizations	P.7.1 Vaccine coverage (measles) as part of national program	5
	P.7.2 National vaccine access and delivery	5
National Laboratory System	D.1.1 Laboratory testing for detection of priority diseases	5
	D.1.2 Specimen referral and transport system	4
	D.1.3 Effective modern point of care and laboratory based diagnostics	5
	D.1.4 Laboratory Quality System	5
Real-Time Surveillance	D.2.1 Indicator and event based surveillance systems	5
	D.2.2 Inter-operable, interconnected, electronic real-time reporting system	3
	D.2.3 Analysis of surveillance data	5
	D.2.4 Syndromic surveillance systems	4
Reporting	D.3.1 System for efficient reporting to WHO, FAO and OIE	5
	D.3.2 Reporting network and protocols in country	4
Workforce Development	D.4.1 Human resources are available to implement IHR core capacity requirements	5
	D.4.2 Field Epidemiology Training Program or other applied epidemiology training program in place	5
	D.4.3 Workforce strategy	4
Preparedness	R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented	5
	R.1.2 Priority public health risks and resources are mapped and utilized.	4

Emergency Response Operations	R.2.1 Capacity to Activate Emergency Operations	5
	R.2.2 Emergency Operations Center Operating Procedures and Plans	4
	R.2.3 Emergency Operations Program	4
	R.2.4 Case management procedures are implemented for IHR relevant hazards.	3
Linking Public Health and Security Authorities	R.3.1 Public Health and Security Authorities, (e.g. Law Enforcement, Border Control, Customs) are linked during a suspect or confirmed biological event	5
Medical Countermeasures and Personnel Deployment	R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency	5
	R.4.2 System is in place for sending and receiving health personnel during a public health emergency	4
Risk Communication	R.5.1 Risk Communication Systems (plans, mechanisms, etc.)	4
	R.5.2 Internal and Partner Communication and Coordination	5
	R.5.3 Public Communication	4
	R.5.4 Communication Engagement with Affected Communities	3
	R.5.5 Dynamic Listening and Rumour Management	4
Points of Entry (PoE)	PoE.1 Routine capacities are established at PoE.	4
	PoE.2 Effective Public Health Response at Points of Entry	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

Note on the Joint External Evaluation (JEE) process:

The Joint External Evaluation process is a peer-to-peer review. As such, it is a collaborative effort between host country experts and External Evaluation Team (EET) members. In completing the self-evaluation, the first step in the JEE process, and as part of preparing for an external evaluation, host countries are asked to focus on providing information on their capabilities based on the indicators and technical questions included in the JEE Tool.

The host country may suggest a score at this time or during the on-site consultation with the external team. The entire external evaluation, in particular the discussions around the score, the strengths, the areas which need strengthening, and the priority actions, is collaborative, with external evaluation team members and host country experts seeking agreement.

The US completed its extensive self-assessment in April and May 2016, producing a comprehensive report that was shared with the External Evaluation Team prior to their visit to Washington and Atlanta from 22 - 27 May. The self-assessment report was produced with contributions from experts from across government representing all the key stakeholders in the implementation of the International Health Regulations in the US.

During the EET visit, US subject matter experts presented to the EET on each of the 19 Technical Areas of the JEE to inform discussion between the experts, senior officials and the EET. The self-assessment and this discussion

together formed the basis for the scoring of the technical areas and the identification of areas of good practice, challenges and priority actions.

The following sections of this report set out the key findings for each Technical Area with agreed scores and actions.

In general, the Priority Actions identified represent the actions that the US team and the EET jointly agreed were the most immediately important and/or the actions that would help increase the US score for a technical area in a future assessment.

The relevant documentation for each area will be accessible through the Self-Assessment Report available online at www.phe.gov.

PREVENT

National Legislation, Policy and Financing

Introduction

The IHR (2005) provide obligations and rights for States Parties. In some States Parties, implementation of the IHR (2005) may require new or modified legislation. Even if new or revised legislation may not be specifically required, States may still choose to revise some regulations or other instruments in order to facilitate IHR implementation and maintenance in a more effective manner. Implementing legislation could serve to institutionalize and strengthen the role of IHR (2005) and operations within the State Party. It can also facilitate coordination among the different entities involved in their implementation. See detailed guidance on IHR (2005) implementation in national legislation at (http://www.who.int/ihr/legal_issues/legislation/en/index.html). In addition, policies that identify national structures and responsibilities as well as the allocation of adequate financial resources are also important.

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 (2005). In some States Parties, implementation of the IHR (2005) 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.

State parties should ensure provision of adequate funding for IHR implementation through national budget or other mechanism.

USA Level of Capabilities

Based on legislative and policy reviews led by ASPR following implementation of the IHR in 2007, the United States developed a national IHR policy and organizational framework. There are established laws, regulations and policies in place, such as the U.S. Public Health Service Act (1944), the Disaster Relief Act (1974), Stafford Act (1988), and the Project BioShield Act (2004) and others, which provide a foundation for disease surveillance and multisectoral coordination and emergency response. Public health in the United States is a multiagency task, with complementary authorities, roles and responsibilities and involves Centers for Disease Control and Prevention (CDC), US Department of Agriculture (USDA), Food and Drug Administration (FDA), Environmental Protection Agency (EPA), Nuclear Regulatory Commission (NRC), Federal Emergency Management Agency (FEMA), Department of Defence (DoD), Department of Homeland Security (DHS) as well as other relevant authorities. All of these agencies that have defined roles in national health security, coordinate with U.S. state and local authorities.

The country has designated points of contact for the IHR in each agency that form the list of "U.S. IHR Stakeholders." Those stakeholders inform the U.S. IHR NFP of potential health events, conduct risk assessments, and participate in multiagency consultation in preparing official IHR notifications. Successful IHR implementation in the United States has led to 77 potential PHEIC notifications to the WHO since 2007.

Evaluation of existing legislation, regulations, and policies to support mechanisms for interagency coordination and response, and updating these where appropriate, could further improve coordination across sectors in public

health emergency response. It would also be valuable to look at mechanisms for coordination in public health events before they reach the threshold for emergency declaration.

Indicators and Scores

P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR

Score **5**

Strengths/ Best Practices

- Various legislation from human, animal and environmental health and food aspects is in place for implementation of IHR
- Development of a national IHR policy and organizational framework following legislative and policy review
- Policies and strategies for public health emergency preparedness and response (e.g. Presidential Policy Directives)
- National Health Security Strategy (NHSS) is part of the overall national health strategy, which provides strategic direction.
- Cross border agreements supporting health security are in place (North America, GHSA etc.)
- Financing of implementation of National Health Security Strategy in place not only for medical assistance and resources during emergencies but also strengthening state and local capabilities and capacities.

Areas which need strengthening/Challenges

- Improve coordination of public health emergency response among the relevant sectors
- Improve preparation and response to public health events that may derive from any of origins including human, animal, food, environment, etc. before becoming emergency or disaster.

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 (2005)

Score **5**

Strengths/ Best Practices

- IHR NFP is empowered to advocate for policy and procedural changes that can improve compliance with IHR
- Clearly defined system for general (domestic) and public health emergency response that defines roles/responsibilities for all agencies
- US consistently meets the timeliness for notification of potential PHEIC

Areas which need strengthening/Challenges

- Continue to regularly evaluate the existing legislation, regulations, and policies relevant to mechanisms, structures and financing for interagency coordination and response.
- Provision of collaborating or coordinating by HHS or other relevant entities to authorize, activate and coordinate at the earliest stages of emerging threats/events prior to emergency declaration.

Recommendations for Priority Actions

1. Continuing evaluation of existing legislation, regulations, and policies to look at opportunities to improve mechanisms for interagency coordination and response.
2. Engaging relevant stakeholders to develop the legislation, regulations and/or policies that facilitate coordination among sectors at all levels of pre-disaster or pre-emergency

IHR Coordination, Communication and Advocacy

Target

The effective implementation of the IHR (2005) requires multisectoral/multidisciplinary approaches through national partnerships for effective alert and response systems. Coordination of nationwide resources, including the sustainable functioning of a National IHR Focal Point (NFP), which is a national centre for IHR (2005) communications, is a key requisite for IHR (2005) 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, continuously update and annually confirm them.

USA Level of Capabilities

The JEE self-assessment comprehensively covered the US processes for coordination, communication and advocacy of IHR activity.

The team members were satisfied that the US has strong multisectoral arrangements in place for delivering the IHR, including a functioning, sustainable NFP connected into the essential elements of a One Health approach to IHR implementation and with agreed processes for intersectoral coordination.

The US Government has recognised that implementation of elements of IHR capacity rests at the state level rather than federal and coordination between federal and state/local public health systems must be fostered.

The self-assessment and the discussions between the US experts and the JEE team demonstrated evidence of systems to deliver timely communication of potential public health events to the NFP and to WHO. The discussions also highlighted the challenges in developing concurrence at the federal level that an event requires IHR-specific risk assessment and in obtaining the information from state and local health departments that is needed for this risk assessment.

Indicators and Scores

P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR

Score **5**

Strengths/ Best Practices

- Clear procedures and guidelines are available for coordination between U.S. NFP and other relevant sectors
- Timely and systematic information exchange between all sectors
- Regional IHR NFP capacity building for developing countries

- Standardized messaging instructions between U.S. NFP and WHO
- Established annual IHR assessment process that evaluates domestic compliance and maintenance of IHR capacity in the U.S.
- Developed multiple internal quality control mechanisms for enhanced IHR communication and situational awareness

Areas which need strengthening/Challenges

- Refining U.S. policy and procedures for IHR compliance is an ongoing effort
- Strengthened and more frequent engagement with U.S. IHR stakeholders in all departments/agencies to help refine complementary IHR policies and structures that facilitate reporting in all sectors
- U.S. development of sustainable training and planning methods for specific IHR implementation policy for agency-specific consideration
- Federal interagency outreach to state/local health department to develop capacity in analytical methods and communications to promote national awareness of potentially international events
- Size and diversity of U.S, coupled with various authorities and capacities for public health, presents challenges in agreement at the federal level if an event requires IHR-specific risk assessment
- Delays in obtaining sufficient information to determine that event meets IHR reporting criteria

Recommendations for Priority Actions

1. Bring together stakeholders (federal, state and local) to discuss the USG 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 NFP processes
5. Improve the ability of the NFP to communicate health risk information within the federal and state networks

Antimicrobial Resistance

Introduction

Bacteria and other microbial species evolve in response to their environment and inevitably develop mechanisms to resist being killed by antimicrobial agents. For many decades, the problem was manageable as the growth of resistance was slow and the pharmaceutical industry continued to create new antibiotics.

Over the past decade, however, this problem has become a crisis. The evolution of antimicrobial resistance (AMR) is occurring at an alarming rate and is outpacing the development of new countermeasures capable of thwarting infections in humans. This situation threatens patient care, economic growth, public health, agriculture, economic security, and national security.

Target

Support work being coordinated by WHO, FAO, and OIE to develop an integrated and 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.

USA Level of Capabilities

The National Antimicrobial Resistance Monitoring System (NARMS) was established in 1996 as a collaboration among the FDA, CDC and USDA to aggregate and report on national surveillance data. On March 27, 2015, the U.S. released its Combating Antimicrobial Resistant Bacteria Action Plan, which advances a “One Health” approach to combating the emergence and spread of antibiotic resistant bacteria.

The CDC laboratory functions as the national civilian AMR reference lab including detection of the WHO priority AMR pathogens. The DoD Multidrug-resistant Organism Repository and Surveillance Network functions as the military’s AMR reference lab. The USDA’s Food Safety and Inspection Service (FSIS) Eastern Laboratory conducts antimicrobial susceptibility testing of isolates from animal origin using CLSI standards. The FSIS NARMS Cecal Sampling Program was launched for food animal monitoring. This program generates approximately 1200 isolates for each microbial target and their AMR. The DOI United States Geological Survey (USGS) Michigan Bacteriological Research Laboratory conducts research on the occurrence, transport, and fate of AMR in the environment, specifically *Escherichia coli* and *Salmonella* species. The FDA has a program to monitor residuals of drugs in foods including plant products.

The CDC Emerging Infections Program conducts population-based surveillance that is published. CDC and DoD conduct point prevalence surveys to assess antibiotic use in hospitals and are characterizing antibiotic prescribing practices on outpatients as well. International reporting of AMR is done through the WHO GLASS program.

The HHS National Action Plan to Prevent Health Care-Associated Infections was created in 2009(<http://health.gov/hcq/prevent-hai-action-plan.asp>). The National Healthcare Safety Network is implemented in a large part of the country (>17000 healthcare institutions enrolled) and reports HCAI. The Association for Professionals in Infection Control and Epidemiology (APIC) supports national training and

professional development (www.apic.org). OSHA standards for handling Bloodborne Pathogens and guidelines for use of personal protective equipment and the respiratory protection programs help to protect health workers as well as patients from nosocomial infections.

The DoD is developing its Antibiotic Stewardship Policy (2016, DoD Instruction 6025.xx). CDC developed the Core Elements of Hospital Antibiotic Stewardship and guidelines for nursing homes. All pharmaceutical companies that produce medically important antimicrobials for use in animals have pledged to implement the Guidance for Industry (GFI) #209 “The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals” (FDA, 2012) by December 2016. The DOI U.S. Fish and Wildlife Service has a program working on FDA approval of pharmaceuticals for use as therapeutics in aquaculture and fisheries management in order to minimize the impact on the development of AMR (http://www.fws.gov/fisheries/aadap/drug_use_guidance.html).

Indicators and Scores

P.3.1 Antimicrobial Resistance (AMR) Detection

Score 4 with a caveat: Environmental Protection Agency (EPA) laboratory is to be included in the AMR Laboratory and Surveillance Network to ensure better understanding of environmental factors affecting AMR.

Strengths/ Best Practices

- Hospital laboratories are accredited as CLIA compliant and use CLSI standards for AMR detection and FDA-approved tests
- New laboratory capacity is being established to fill the gap between data needed for patient management and data needed for public health
- Using public health laboratory capacity for AMR pathogen characterization

Areas which need strengthening/Challenges

- Training a public health laboratory workforce to perform reference-level AMR testing

P.3.2 Surveillance of infections caused by AMR pathogens

Score 4

Strengths/ Best Practices

- Surveillance systems capture complementary data from multiple sources
- Interagency collaboration to collect One Health AMR Data from animals, food and humans.
- Implementing whole genome sequencing of AMR pathogen associated threats for outbreak detection and surveillance for acquired resistance mechanisms.

Areas which need strengthening/Challenges

- Technical and logistical issues with the electronic transfer of hospital AMR data to a centralized database
- Not all hospitals or laboratories have the same ability to rapidly characterise AMR organisms locally.

P.3.3 Healthcare associated infection (HCAI) prevention and control programs

Score 4

Strengths/ Best Practices

- A National HCAI prevention action plan
- CDC/ Healthcare Infection Control Practices Advisory Committee (HICPAC) advisory committee to develop national guidelines
- Network of public health/academic partners to develop and evaluate prevention interventions

Areas which need strengthening/Challenges

- The US should ensure funded plans exist to continue the existing programme in the future (for >5 years)
- The US should consider improving the coverage of HCAI activity to a greater proportion of the healthcare system

P.3.4 Antimicrobial stewardship activities

Score 3

Strengths/ Best Practices

- Good buy-in for implementing stewardship programs in healthcare settings
- Electronic reporting of antibiotic use data from healthcare facilities to a national database.

Areas which need strengthening/Challenges

- Surveillance for antibiotic use on the farm
- Gaining access to antibiotic use data for food-producing animals
- Documentation and publishing results of stewardship activities at health facilities and animal farms needs to be uniformly consistent.

Recommendations for Priority Actions

1. Build animal and human public health laboratory capacity to detect and characterize AMR pathogens to inform public health action
2. Further enhance multi-sectoral and multidisciplinary coordination and collaboration, particularly the agricultural plant and environment sector, including the Environmental Protection Agency, as well as strengthening 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

Zoonotic Disease

Introduction

Zoonotic diseases are communicable diseases and microbes spreading between animals and humans. These diseases are caused by bacteria, viruses, parasites, and fungi that are carried by animals and insect or inanimate vectors may be needed to transfer the microbe. Approximately 75% of recently emerging infectious diseases affecting humans is of animal origin; approximately 60% of all human pathogens are zoonotic.

Target

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

USA Level of Capabilities

The CDC and the USDA routinely coordinate and partner with other federal and state animal and human health partners and stakeholders to detect, prevent, and respond to, zoonotic diseases of public health importance. The nation has an extensive animal and human epidemiology, surveillance, response, and laboratory capacity with a strong focus on zoonotic diseases in both human and animal populations. A One Health approach, focusing on the interface of human, animal, and environmental health, is critical to the prevention and control of zoonoses.

At the federal level, the CDC and USDA collaborate on a number of well-established and important zoonotic disease surveillance programs including rabies, bovine spongiform encephalopathy, trichinellosis, enteric zoonoses, brucellosis, bovine tuberculosis, and animal (primarily swine and avian) influenza. Additionally, CDC is responsible for investigating illnesses and outbreaks of zoonotic diseases in humans, and works in tandem with other U.S. Government partners for a coordinated One Health approach. CDC's nationally notifiable disease list covers reportable zoonotic diseases in humans, and USDA has proposed an extensive reportable disease list for animal populations that complements the CDC list.

With the respect to public health veterinary workforce, 30 colleges of veterinary medicine provide many students per year with opportunities to receive advanced public health training. A number of sponsored internship and fellowship programs exist for pending or recent graduates, and there is coursework available for established professionals to gain new skills related to epidemiology and laboratory capacity for zoonoses in animals and people.

Indicators and Scores

P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens

Score **3**

Strengths/ Best Practices

- Systems in place for surveillance, laboratory capacity, response, and prevention for multiple zoonotic diseases in humans and animals with increasing emphasis on One Health approach to better understand and respond to the rapidly changing disease dynamics at the human-animal-environment interface

- Programs are in place at national and state levels to monitor specific animal populations for zoonotic diseases to track potential risk for human populations
- Numerous human and animal surveillance systems, pathogen-specific response plans, algorithms, and partnerships to help guide response to outbreaks of zoonotic diseases in both human and animal health sectors
- Human and animal health programs within CDC, FDA, APHIS, FSIS, and DHS maintain liaisons embedded in each other's organizations to ensure ongoing and daily collaboration in surveillance, detection, and response
- Strong partnership between CDC's One Health Office and USDA's One Health Coordinating Center

Areas which need strengthening/Challenges

- Human and animal health agencies are not fully integrated at the state and federal level within US
- Some Departments have created One Health Offices and/or interagency working groups but this is not currently government wide
- A few zoonoses have a routine specimen-sharing process in place, but for most part the current process is informal and *ad hoc* for zoonotic pathogens, typically driven by an outbreak response
- Interoperability among the many information systems used in animal and human health sectors for zoonotic diseases is limited

P.4.2 Veterinary or Animal Health Workforce

Score **4**

Strengths/ Best Practices

- Majority of states (40 out of 50) have a dedicated public health veterinarian
- Opportunities for training new generations at undergraduate and graduate levels are available through internship and fellowship programs to provide veterinary public health experience

Areas which need strengthening/Challenges

- Not all states have a dedicated public health veterinarian, and there are too few animal health specialists at the national level to provide adequate support to state and local programs.
- A longer term succession plan on public health veterinarians is needed to minimize HR gaps

P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional

Score **4**

Strengths/ Best Practices

- Human and animal health agencies maintain EOCs for sharing information, exchanging liaison personnel, and contacting relevant experts to deal with emergencies at all time.
- Human and animal health programs within CDC, FDA, APHIS, FSIS, and DHS maintain liaisons embedded in each other's organizations to ensure ongoing and daily collaboration in surveillance, detection, and response

Areas which need strengthening/Challenges

- Similarly to the areas to be strengthened identified for indicator P.4.1, operationalising a formal One Health approach at national and state level that accounts for steady state and emergency response is needed.

Recommendations for Priority Actions

1. Establish a National One Health approach which 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 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 national, state and local levels

Food Safety

Introduction

The rapid globalization of food production and trade has increased the potential likelihood of international incidents involving contaminated food. The identification of the source of an outbreak and its containment is critical for control. Risk management capacity with regard to control throughout the food chain continuum must be developed. If epidemiological analysis identifies food as the source of an event, based on a risk assessment, suitable risk management options that ensure the prevention of human cases (or further cases) need to be put in place.

Target

State parties should have surveillance and response capacity for food and water borne diseases' risk or events. It requires effective communication and collaboration among the sectors responsible for food safety and safe water and sanitation.

USA Level of Capabilities

The United States has a strong regulatory system for the safety of the U.S. food supply, a system shared by many federal, state, and local agencies. The U.S. Government has the authority to establish regulatory standards, inspect facilities, and take action if there are violations, but industry has the primary responsibility to ensure that food products are safe and meet applicable regulatory requirements. State and local government agencies also have similar authorities regarding food safety.

The FDA Food Safety Modernization Act signed into law in 2011, has augmented numerous other existing laws and regulations to better protect human and animal health by helping to ensure the safety and security of the food and feed supply, including through implementation of specific prevention activities.

Federal partners work closely with each other as well as with state and local agencies, private companies, and consumers to address food safety from farm to table. CDC and state public health agencies are responsible for monitoring, identifying, and investigating foodborne illness and outbreaks. CDC coordinates closely with FDA and USDA as the U.S. regulatory authorities for food products. The U.S. capacity to detect and respond to foodborne outbreaks, including those that result in a public health emergency, has improved dramatically in the past two decades. Since 1996, CDC has used DNA "fingerprinting" of bacteria to enhance outbreak detection and define the scope and scale of outbreaks beyond traditional methods. That system, *PulseNet* consists of over 80 federal, state, and local laboratories in the United States.

CDC works closely with State and local health departments who have the primary statutory authority and responsibility for disease surveillance. Most foodborne outbreaks are local events in just one city or county; local public health officials investigate those outbreaks. State health departments investigate outbreaks that spread across several cities or counties. Those health departments often work with their departments of agriculture and with federal food safety agencies as needed. In partnership with FDA and FSIS, CDC typically leads investigations of multistate outbreaks – those that affect many states at once. However, the FBI is the lead federal agency for law enforcement investigations of any potentially intentional biological or chemical threat or incident, such as, but not limited to, food adulteration.

Indicators and Scores

P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination:

Score **4**

Strengths/ Best Practices

- Strong primary prevention system for foodborne illnesses through regulatory, public health, and risk analysis efforts across the farm-to-table continuum.
- Strong public-private partnerships for science-based food safety best practices to reduce the risk of illness from entities that produce, process, and distribute food.
- Multiagency and multidisciplinary participation through every stage of detecting, investigating and responding to foodborne outbreaks and illness has become routine during multistate outbreak investigations.

Areas which need strengthening/Challenges

- Multistate outbreaks are difficult to detect and investigate due to the wide distribution and multiple sources of many food ingredients and products;
- Coordination of specialized laboratory testing to trace and track cases and unexpectedly contaminated foods sources.
- Although coordination among federal and state agencies and experts from health, food, and agricultural sciences is consistent, there is a need to continuously evaluate, modernize, and strengthen the coordination of detection and investigation activities.

Recommendations for Priority Actions

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 whole genome sequencing 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.

Biosafety and Biosecurity

Introduction

Working with pathogens in the laboratory is vital to ensuring that the global community possess a robust set of tools—such as drugs, diagnostics, and vaccines—to counter the ever evolving threat of infectious diseases.

Research with infectious agents is critical for the development and availability of public health and medical tools that are needed to detect, diagnose, recognize, and respond to outbreaks of infectious disease of both natural and deliberate origin. At the same time, the expansion of infrastructure and resources dedicated to work with infectious agents have raised concerns regarding the need to ensure proper biosafety and biosecurity to protect researchers and the community. Biosecurity is important in order to secure infectious agents against those who would deliberately misuse them to harm people, animals, plants, or the environment.

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.

USA Level of Capabilities

The United States has built a comprehensive national biosafety and biosecurity system covering all areas of society. These extensive oversight requirements and guidelines on biosafety and biocontainment exist both at the governmental and state levels, and at academic and other research institutes. The strengths of the system lie in active federal outreach and education, and promoting and improving biosafety and biosecurity overall. These federal regulations include e.g. Occupational Safety & Health Administration (OSHA) regulations, HHS/CDC regulations, USDA APHIS regulations and Select Agent Regulations (SAR), of which the latter covers both human and agricultural pathogens and toxins, and provides for federal oversight of laboratories that possess, use, or transfer any biological select agents and toxins. The SAR authorizes HHS and USDA to define and control select agents, and contains mandatory training in biosafety and biosecurity practices for those registered under the FSAP. Key guidelines include the *Biosafety in Microbiological and Biomedical Laboratories* (BMBL) and the *NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules*, which specifies the practices on NIH-funded research on recombinant or synthetic nucleic acid molecules.

However, the recent biosafety and biosecurity incidents in government laboratories underline the importance of continuous work to develop coordinated, whole-of-government oversight and proper training of the staff to gain sufficient experience and expertise to work safely with select agents and other dangerous pathogens.

The government has already responded vigorously by reviewing existing recommendations and practices. The priority areas for action and new recommendations are addressing such issues as training, institutional cultures, governance, risk assessments and documentation in the laboratories handling select agents. New implementation plans have been prepared, and implementation of some of the recommendations is already on-going. The gain-of-function studies are broadly discussed within the scientific community and working groups evaluating the risks and benefits associated with gain-of-function studies, and developing draft recommendations on a conceptual approach for evaluating proposed studies.

Indicators and Scores

P.6.1 Whole-of-Government biosafety and biosecurity system is in place for human, animal, and agriculture facilities

Score 4

P.6.2 Biosafety and biosecurity training and practices

Score 4

Strengths/ Best Practices

- Comprehensive national biosafety and biosecurity system
- Active federal outreach and education activities
- Strong commitment to promoting and improving biosafety and biosecurity overall, including laboratories working with dangerous pathogens and toxins
- BMBL & NIH Guidelines
- CDC and APHL developed Guidelines for Biosafety Laboratory Competency and Competency Guidelines for Public Health Laboratory Professionals
- Comprehensive, multi-stakeholder approach to evaluating biosafety and the impacts on science
- The US Government, life sciences community, and other stakeholders are conducting a comprehensive assessment of gain-of-function research to develop new federal policy to guide future investments in this area

Areas which need strengthening/Challenges

- General oversight framework
- Revisions to the SAR to require documentation of problems identified during drills/exercises and the corrective action(s) taken
- No single mechanism exists to ensure and monitor staff competence and proper training at all laboratories.

Recommendations for Priority Actions

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

Immunization

Introduction

Immunization is one of the most successful global health interventions and one of the most cost-effective ways to save lives and prevent disease. Immunizations are estimated to prevent more than two-million deaths a year globally.

Target

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

USA Level of Capabilities

The United States sustains a comprehensive and accessible system to administer and record immunizations. There are specific recommendations for children and adults in various age categories, with special guidance for those with health conditions as well as other occupational hazards, international travel, or chronically ill family members.

The United States has a comprehensive and functional national vaccine delivery system that is able to respond to new disease threats based on the current best available science and technology platforms. Strong public-private partnerships exist with nationwide reach, effective distribution chains, access for marginalized populations, adequate cold chain, and ongoing quality control. Federal funding is available through the Vaccines for Children Program, the U.S. Public Health Service Act, and the Affordable Care Act to improve access to vaccines. Vaccine safety monitoring and assessment tools enable rapid identification and investigation of concerns about vaccines, with rapid actions when needed to prevent harm. U.S. vaccination programs have eliminated many vaccine-preventable diseases and reduced the incidence of several others; however, opportunities exist for additional reductions and the associated decrease in morbidity and mortality.

There is no federal mandate that requires vaccinations – policy and requirements will vary by state. The U.S. Government has identified programmatic challenges, evolving issues, and some effective interventions related to adult and adolescent vaccination programs. Among current challenges, there are still persistently low vaccination rates in small sub-populations and at-risk groups. There are also problems with societal awareness and understanding of vaccine recommendations beyond those for children. Financing for adult vaccines varies by state and local level creating different challenges and solutions from one state to another.

Indicators and Scores

P.7.1 Vaccine coverage (measles) as part of national program

Score 5 with caveat: The United States still has persistently low vaccination rates in small sub-populations and at-risk (socioeconomic) groups which cause disparities in vaccination coverage. The indicator used for monitoring and evaluation of immunisation in the JEE Tool has changed since USA started their self-assessment. Originally the criterion for level 5 was 90%, this has been changed to 95%. Therefore there is agreement that with the monitoring and evaluation framework in place at the time of the self-assessment the score is 5, but to achieve a score of 5 under the current framework, USA would have to develop plans to increase coverage to 95% by 2020.

P.7.2 National vaccine access and delivery

Score 5

Strengths/ Best Practices

- Vaccine delivery (maintaining cold chain) in the US is available in all 50 states
- The national Vaccines for Children (VFC) Program provides vaccine at no cost to children from birth through 18 years of age who are uninsured, Medicaid-eligible, or American Indian or Alaska Native
- The government maintains stockpiles of all routinely recommended paediatric vaccines that can be used to mitigate vaccine supply shortages

Areas which need strengthening/Challenges

- Improve vaccination coverage for all populations to achieve the new measles coverage goal of 95% by 2020
- Increase interoperability between state-based immunization information systems and provider level electronic health records.
- Reduce disparities in vaccination coverage among sub-populations

Recommendations for Priority Actions

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

DETECT

National Laboratory System

Introduction

Public health laboratories provide essential services including disease and outbreak detection, emergency response, environmental monitoring, and disease surveillance. State and local public health laboratories can serve as a focal point for a national system, through their core functions for human, veterinary and food safety including disease prevention, control, and surveillance; integrated data management; reference and specialized testing; laboratory oversight; emergency response; public health research; training and education; and partnerships and communication.

Target

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

USA Level of Capabilities

The United States has a federated, decentralized public health system in which public health, clinical care, and animal health sectors work together to respond to public health threats. Major laboratory partners and networks include:

- *Laboratory Response Network (LRN)*: Network for identifying human pathogens that have epidemic potential in addition to chemical threats; works with many disease-specific programs
- *Association of Public Health Laboratories (APHL)*: Primary organization representing and facilitating activities with state PHL
- *Integrated Consortium of Laboratory Networks (ICLN)*, forms the basis for a system of laboratory networks capable of integrated and coordinated response to and consequence management of acts of terrorism and other major incidents requiring laboratory response capabilities
- The National Animal Health Laboratory Network (NAHLN) is a nationally coordinated network and partnership of Federal, State, and university-associated animal health laboratories that provide animal health diagnostic testing, methods research and development, and expertise for education and extension to detect biological threats to the nation's animal agriculture
- The Food Emergency Response Network (FERN) integrates the nation's food-testing laboratories at the local, state, Federal, tribal, and territorial levels into a network that is able to respond to emergencies involving biological, chemical, or radiological contamination of food

The US National Laboratory System is capable of conducting the following core tests: Influenza virus, Poliovirus, HIV, *Mycobacterium tuberculosis*, *Plasmodium spp*, *Salmonella enteritidis serotype typhi*. In addition, other testing capabilities at selected sites in the US laboratory system include MERS-CoV, Measles, Carbapenam-resistant *Enterobacteriaceae*, Ebola virus PCR. Selection of pathogen tests in animal health laboratories is congruent with OIE standards.

Most zoonotic diseases of concern are nationally notifiable diseases with corresponding state-level statutes for case reporting and referral of specimens or isolates. Most of the animal diseases that are on the proposed list of

reportable conditions are also potential zoonotic diseases. Generally, data are shared via direct exchange between subject matter experts on an ad hoc basis depending on the disease. Other exchanges of human and animal laboratory data occur through One Health arrangements (detailed in the section on *Zoonotic Diseases*) as well as during outbreaks or research projects.

The US government has established national standards for clinical laboratory testing under the Clinical Laboratory Improvement Act (CLIA), which establishes minimum standards for quality assurance, supervision, oversight, and review of laboratories and their personnel. Some states have more stringent state-specific requirements. Quality assurance is an integral component of the laboratory accreditation system. All laboratories performing diagnostic tests on specimens derived from humans are regulated under the federal CLIA. A number of U.S. laboratories are accredited to conduct testing as a part of the global networks of reference laboratories for WHO, OIE and FAO.

A system is in place to transport specimens to national laboratories for both animal and human sectors under the federal regulations of the Department of Transportation (DOT) which include a classification scheme and corresponding packaging, labeling, and shipping requirements for substances that are known to contain infectious/hazardous material as well as those that are for diagnostic or investigational purposes. The DOT regulations for packaging and shipping are aligned with ICAO standards, the ICAO Technical Instructions on Dangerous Goods, and WHO and OIE guidelines. U.S. laboratories in the United States and abroad typically receive specimens for referral testing and maintain an extensive network of formal and informal relationships with other laboratories.

There is an extensive commercial market in point-of-care diagnostics for clinical care and regulation helps to encourage manufacturers to improve accuracy and simplicity of use. The promotion of point-of-care tests varies by detection and control strategies for different pathogens. Referral for specialized testing is recommended for suspected dangerous pathogens such as Ebola virus. The FDA reviews and approves these POC devices for accuracy, adequate instructions for use, and manufacturing standards prior to commercial distribution. Also, through an Emergency Use Authorization (EUA), FDA may authorize the emergency use of an unapproved test kit during, or in preparation for, certain types of emergencies, such as Ebola or Zika virus, if there is sufficient scientific data and other statutory criteria are met.

Indicators and Scores

D.1.1 Laboratory testing for detection of priority diseases

Score **5**

Strengths/ Best Practices

- All states, territories, and several large municipalities have the ability to test for all of the significant practices for both human and animal health sectors.
- Sustainable capability for performing modern molecular and serological techniques as part of a national system of sample referral and confirmatory diagnostics is in place.
- Sharing of samples and data, including whole genome sequence and associated metadata, in public repositories for public health agencies and researchers to use globally

Areas which need strengthening/Challenges

- Laboratory systems are vulnerable to fluctuations in federal and/or local funding. An analysis of vulnerabilities in capacity and capability to provide testing services (especially with surge requirements) would help support whole-of-government resilience planning.

D.1.2 Specimen referral and transport system

Score **4**

Strengths/ Best Practices

- The regulations and practices on specimen transportation including packaging and shipping are aligned with international standards and guidelines relevant to health and transportation.
- The U.S. Government is leveraging partnerships to discuss the barriers and put in place protocols for rapid sample sharing in anticipation or during a public health emergency

Areas which need strengthening/Challenges

- Transportation of animal samples/specimen from some parts of the country may take longer due to the size of the country
- Changes in the supplier arrangements for transport of class 1 BSAT pathogens have increased transportation complexities and costs associated with transportation.

D.1.3 Effective modern point of care and laboratory based diagnostics

Score **5**

Strengths/ Best Practices

- Various effective modern point of care and diagnostics are available in the US as indicated in the JEE-self-assessment report.

Areas which need strengthening/Challenges

- Continuous expanding use of culture-independent diagnostic tests for patient care

D.1.4 Laboratory Quality System

Score **5**

Strengths/ Best Practices

- U.S. laboratory regulations require registration and certification of every laboratory performing clinical tests, regardless of size or site.
- Standardized case notification reporting
- Jurisdictional public health laboratories, following standards set by the CDC, are required to work closely with clinical laboratories to respond to emerging diseases through a tiered reference and referral system

Areas which need strengthening/Challenges

Recommendations for Priority Actions

1. Institutionalize the partnerships among collaborating federal agencies by jointly developing policies and programs to strengthen the laboratory networks across health sectors and between federal and states regarding financing, harmonizing the lab protocols, reporting chains, laboratory information systems, sample sharing, roles of laboratory support to surveillance for outbreaks and emerging trends as well as 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 or during a public health emergency.
5. Continue to engage in various global lab networks including sharing resources, experiences, data, and biological samples taking into consideration the global benefits.

Real-Time Surveillance

Introduction

The purpose of real-time surveillance is to advance the safety, security, and resilience of the Nation by leading an integrated bio-surveillance effort that facilitates early warning and situational awareness of biological events.

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, national and international levels of authority regarding surveillance of events of public health significance; improved country and regional capacity to analyse 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 the IHR and the OIE standards.

USA Level of Capabilities

The U.S. public health system has a strong surveillance system, including rapid detection of health threats, risk assessments, notifications and effective response. The U.S. surveillance systems have developed over many years and there are currently many parallel but very effective systems. Surveillance roles and responsibilities are defined through public health policy, regulation, and law within each state's jurisdiction as well as at the local levels within states. National organizations, such as the Council of State and Territorial Epidemiologists (CSTE), develop consensus-based positions among their membership, to support notifications from the states to the federal level (e.g., CDC). The U.S. maintains an impressive and high level of academic research in the area of surveillance and continually works with improving the systems in order to adapt to a constantly changing environment and to take use of new technological development. Interoperability and electronic linkage between different systems, in particular across various sectors, remains challenging and are still very limited. For biosurveillance purposes there is a need for collecting and analysing large and diverse datasets as well as integrating this with other types of non-clinical information sources, but there are shortages of personnel at the subnational level able to do this.

Indicators and Scores

D.2.1 Indicator and event based surveillance systems

Score **5**

D.2.2 Inter-operable, interconnected, electronic real-time reporting system

Score **3**

D.2.3 Analysis of surveillance data

Score **5**

D.2.4 Syndromic surveillance systems

Score 4

Strengths/ Best Practices

- The U.S. public health system is capable of rapidly detecting public health threats, conducting risk assessments, notifying, and responding effectively
- Local-to national surveillance roles and responsibilities are defined in both public health policy and legislation
- Building partnerships and trust is needed and has been successful in linking various sectors and ways of reporting.
- Creating a shared analytic workspace is needed for effective collaboration and interoperability

Areas which need strengthening/Challenges

- The long history of U.S surveillance systems contributes to their strength but their different purposes and funding has resulted in many parallel systems and hence many are not interoperable and electronic linkages are very limited, especially between different sectors
- Shortages of trained personnel at the subnational levels who are capable of collecting and analysing large volumes of diverse data as well as integrating that information with non-clinical information source (i.e. news reporting, social media, or environmental testing) for biosurveillance purposes

Recommendations for Priority Actions

1. There are opportunities for the U.S. departments and agencies to exchange and integrate the results of their respective surveillance program better
2. Enhance strategies and partnerships to increase the use and interoperability of electronic health care records
3. Increase the number of trained personnel at the subnational levels who are capable of collecting and analysing large volumes of diverse data as well as integrating that information with non-clinical information source

Reporting

Introduction

Health threats at the human–animal–ecosystem interface have increased over the past decades, as pathogens continue to evolve and adapt to new hosts and environments, imposing a burden on human and animal health systems. Collaborative multidisciplinary reporting on the health of humans, animals, and ecosystems reduces the risk of diseases at the interfaces between them.

Target

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

USA Level of Capabilities

The United States has an extensive network of epidemiologic, laboratory, and early warning surveillance systems. Several federal agencies, as well as all 50 states, engage in surveillance and reporting activities through crosscutting efforts. These U.S. systems are able to identify quickly nationally notifiable and unusual or unexpected health events for both human and animal populations to ensure reporting obligations are fulfilled under the IHR and the standards promoted by OIE and FAO.

Integration of OIE, FAO and WHO reporting requirements in the United States has created an efficient system that minimized the potential for inconsistent or conflicting notifications. The federal government is the obligated entity under WHO, OIE and FAO for event reporting while the states are not obligated to take part in the reporting. Other capabilities are summarized below.

- Points of contacts;
 - There is a national focal point for IHR located in HHS Assistant Secretary for Preparedness and Response. (ASPR).
 - The USDA serves as the U.S. Government focal point for OIE and is the U.S. focal point for the animal health component and CDC is the human health component of One Health activities in the U.S. Government
 - Points of contact for the FAO International Food Safety Authorities Network (INFOSAN) are:
 - FDA: Director of FDA’s Emergency Operation Center;
 - CDC: Division of Foodborne, Waterborne and Environmental Diseases (DFWED) Senior Advisor for Food Safety and the Branch Chief of the Enteric Diseases Laboratory Branch;
 - USDA: FSIS Assistant Administrator for the Office of Public Health Science.
- There is an existing mechanism for information exchange based on type of event and liaison persons are assigned
- The list of notifiable diseases exists and CSTE encourages the state health departments to report on the list of notifiable diseases under IHR
- The US NFP coordinates the five step process for IHR even assessment and notification and all notification always happen on time
- Within the agencies there is also an elaborate mechanism of even verification assessment and notification

- The United States has developed multilateral regional and bilateral reporting agreements with neighboring countries.
- The U.S. IHR NFP has used the consultation mechanism (Article 8) in numerous occasions

As described in the section on *National Legislation, Policy and Financing*, and *IHR Coordination, Communication and Advocacy*, full understanding of the IHR is not universal among the US departments and agencies, and it is uncertain how state health officials perceive their roles in the federal obligations. A weakness in the United States current IHR implementation is the lack of institutional continuity and consistency within and among the agencies.

A more explicit US Government policy for international event reporting, as described in the *National Legislation, Policy and Financing* section, could help to improve overall coordination among the agencies and subnational public health authorities by creating opportunities for dialogue, training, exercises and communication.

Another important opportunity is the further development of US Government programmes that specifically address WHO, OIE and FAO event assessment and reporting requirements. This would necessarily require a multi-agency approach. As the national advocate for the IHR implementation the US IHR NFP could consider the way to develop, coordinate and promote the dissemination of the multiagency standard operating procedure that help to guide agency and interagency activities related to IHR. Such guidance could also serve as a more comprehensive resource for states and overseas territories that is complementary to other, existing international agreements.

Indicators and Scores

D.4.1 System for efficient reporting to WHO, FAO and OIE

Score **5**

Strengths/ Best Practices

- Integration of OIE, FAO and WHO reporting requirements in the United States has created an efficient system that minimize the potential for inconsistent or conflicting notifications
- Agencies that most commonly identify notifiable events are well versed in working through their respective reporting requirements.

Areas which need strengthening/Challenges

- There is not universal, full understanding of the IHR among the US departments and agencies and a lack of institutional continuity and consistency within and among the agencies
- More explicit US Government policies for international event reporting could help to improve overall coordination
- State and local health officials are not very familiar with the IHR or the international reporting requirements, and because public health systems at the state level are unique, each must establish unique practices that support the federal reporting requirement

D.4.2 Reporting network and protocols in country

Score **4**

Strengths/ Best Practices

- Because the IHR itself does not account for every variation in biology, epidemiology or human behaviour, the United States has developed informal though effective processes for deliberating among the relevant agencies and coordinating with the WHO regional Office on interpretations of the reporting requirement in the IHR

Areas which need strengthening/Challenges

- Improve understanding of OIE, FAO and WHO reporting requirements among federal, state and local stakeholders by exercising roles and responsibilities through a multi stakeholders by exercising roles and responsibilities through a multi-stakeholder facilitated discussion.
- Improve overall coordination among the agencies and subnational public health authorities by creating opportunities for dialogue, training, exercises and communication

Recommendations for Priority Actions

1. Improve understanding of WHO, OIE, FAO requirements among federal, state and local stake holders through multi-sector discussion
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

Workforce Development

Introduction

Workforce development is important in order to develop a sustainable public health system over time by developing and maintaining the highly qualified public health workforce with appropriate technical training, scientific skills, and subject-matter expertise.

Target

State 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 (2005).

USA Level of Capabilities

The US has systems to develop and maintain a qualified public health workforce at national, state and local levels but these are not set within an overall national workforce strategy. A challenge for the future will be sustaining the workforce and encouraging engagement from underserved populations.

In the United States, the state-level public health departments all have epidemiology, laboratory, and case management capacity. The federal government supplements state capacity to prepare for, and respond to, any public health emergency through CDC's Division of State and Local Readiness (DSLRL), which provides both technical assistance, training and funding.

CDC helps build the future public health workforce through management and delivery of fellowships with specific target audiences, including epidemiology, public health informatics, laboratory sciences, economics and decision sciences, public health policy and management, and other public health disciplines.

Many other federal departments and agencies train and employ public health personnel who, under specific circumstances, are available to respond within their agencies and in temporary assignments to other agencies during public health emergencies. As mentioned in the section on *Preparedness*, these include the CDC, USDA, NIH, and FDA, with additional support from NDMS and the USPHS.

There are two main field epidemiology training programs currently implemented in the United States. These programs provide high-quality training experiences and to secure long-term career placement for field epidemiologists at the state or local level.

The Epidemic Intelligence Service (EIS) is an advanced level, two-year, on-the-job training and service fellowship conducted by the CDC. EIS trains physicians, veterinarians, scientists, and other health professionals who may come from a variety of settings, including academia, clinical practice, government, and non-governmental agencies, to apply epidemiology to solve public health problems.

The Applied Epidemiology Fellowship is closely designed after the Epidemic Intelligence Service program but is conducted by the Council of State and Territorial Epidemiologists (CSTE). In that program, those who already have a master- or doctoral-level degree, and who are interested in public health practice at the state or local level, receive training in epidemiology or a related field.

CSTE tracks the status of field epidemiology staffing in the United States. Since 2001, the CSTE has conducted a series of periodic standardized assessments of the epidemiology capacity of state and territorial health departments to estimate the number of state and local epidemiologists working in the United States

The APHIS Veterinary Services conducts two training programs,, which target current veterinary epidemiologists. The veterinary field epidemiology program, which trains about 25 epidemiologists annually, provides trainees

with the tools to effectively manage and direct surveillance and eradication programs, particularly focused on protecting animal health. USDA has also partnered with state veterinary labs in Virginia, Maryland, and Mississippi to coordinate veterinary laboratory outreach and education efforts.

USDA APHIS tracks veterinary field epidemiology capacity.

Additional programs for emergency staffing

NDMS teams are composed of pre-identified personnel including licensed and credentialed civilian medical personnel capable of performing a wide range of duties in the post-disaster phases. NDMS members are organized into state-level teams, which are activated as needed to respond throughout the country. Upon activation, team members take leave from their primary employers and become temporary federal employees for the duration of their assigned mission. The primary purpose of the NDMS is to supplement an integrated national medical response capability for assisting U.S. state and local authorities in dealing with the medical impacts of major peacetime disasters.

The USPHS Commissioned Corps is composed of uniformed officers with qualifying degrees in health and public health fields. Members of the Commissioned Corps hold positions throughout the federal government workforce including the HHS, DHS, DoD, and the DOJ, and may be activated to deploy in response to domestic and international emergencies, as needed. The Commissioned Corps includes a Readiness and Deployment Operations Group, which consists of pre-identified teams capable of deploying within 12-36 hours of notification to provide mass care at shelters, distribute and/or administer medicines, and/or conduct community outreach and assessments, among other functions. As seen during the recent response to the Ebola epidemic in West Africa, Commissioned Corps officers may also be deployed internationally to handle specialized missions, which may include direct patient care.

Indicators and Scores

D.5.1 Human resources are available to implement IHR core capacity requirements

Score **5**

D.5.2 Field Epidemiology Training Program or other applied epidemiology training program in place

Score **5**

D.5.3 Workforce strategy

Score **4**

Strengths/ Best Practices

- Following a long tradition of professional education, apprenticeship, and practical application of learning, the U.S. public health workforce has developed in parallel with its public health system.
- The public health workforce receives primarily public financing, and there are many opportunities for specialization, research, career advancement, and diverse career experiences, though not necessarily homogeneously across the country.
- Professional associations provide important support for the public health workforce in the United States, ensuring opportunities for professional development, establishing standards for accreditation, promoting fair remuneration and job opportunities, and maintaining a network for routine and emergency communications.

Areas which need strengthening/Challenges

- Workforce data for public health professionals other than epidemiologists is inconsistent, making it difficult to establish priorities for education and professional development.
- While many federal agencies and states have human resource models for their public health offices, there is no overarching national capacity goal that helps to identify or predict shortages.
- As with other highly specialized professions, the extent to which jurisdictions that are socioeconomically disadvantaged are capable of recruiting and sustaining a workforce that meets the needs of their populations remains unknown.
- Although some actions are being taken at the national level, there is as yet no federal focus or policy on public health workforce. The PHEP cooperative agreements provide critical resources for 62 state and jurisdiction health departments, but that program does not typically include local workforce assessments.
- Notable needs include
 - an evaluation of the size and effectiveness of workforce and
 - mechanisms to work with states to ensure there are a sufficient number of public health practitioners and other public health professionals at the state and jurisdiction levels.

Recommendations for Priority Actions

1. The U.S. government should use existing data sources to study the existing multidisciplinary public health workforce and anticipated gaps between human resource needs and staffing at state and local levels.
 - This will supplement the current knowledge on staff enumeration and help in projection and planning.
 - It will also inform the CDC plan to create a National Action Plan for public health workforce development
2. Establishment of workforce staffing and incentives models in collaboration with existing agency programs to reduce human resources gaps through either existing or new public support models.
3. Meanwhile, existing programs could increase focus on human resource recruitment, development and retention

RESPOND

Preparedness

Introduction

Preparedness includes the development and maintenance of national, intermediate and community/primary response level public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. Other components of preparedness include mapping of potential hazards, the identification and maintenances of available resources, including national stockpiles and the capacity to support operations at the intermediate and community/primary response levels during a public health emergency.

Target

The effective implementation of the IHR (2005) requires multi-sectoral/multidisciplinary approaches through national partnerships for effective alert and response systems. Coordination of nationwide resources, including the sustainable functioning of a National IHR Focal Point (NFP), which is a national centre for IHR (2005) communications, is a key requisite for IHR (2005) 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, continuously update and annually confirm them.

USA Level of Capabilities

United States of America possesses an outstanding preparedness and response system; it includes a number of frameworks, plans and guidance documents. This system has been tested and improved several times over the last years. The 9/11 and anthrax attacks in 2001 and Hurricane Katrina in 2005 triggered the comprehensive review and restructuring of the national security policy and the domestic public health preparedness, response, and recovery system.

In order to achieve a secure and resilient nation, the National Preparedness System provides the overarching doctrine for building, sustaining, and delivering the core capabilities.

The National Planning Frameworks, key elements of the National Preparedness System, describe the roles and responsibilities for the whole community across all mission areas: prevention, protection, mitigation, response, and recovery.

The Secretary of Homeland Security coordinates to provide interagency unity. Within HHS, the office of the Assistant Secretary for Preparedness and Response is the lead agency for coordination of domestic and international public health preparedness and response activities and in charge of maintaining and coordinating a number of national systems. Many other offices and entities within the federal government like ASPR, USDA, CDC, FDA, NIH, USPHS and others have specified roles to provide the bulk of the public health surge capacity across the federal government. In addition, there is a variety of organizations and entities in charge of the development, procurement, and distribution of public health emergency medical countermeasures.

USA has a Strategic National Stockpile (SNS) with large quantities of medicine and medical supplies used to protect human and animal health if there is a public health emergency (terrorist attack, flu outbreak, earthquake) severe enough to cause local supplies to run out.

The Strategic National Risk Assessment (SNRA) was completed in 2011, it provides U.S. policy makers and planners a foundation for domestic capacity development and a means for agencies to share information and planning considerations as well as to help align those policy/planning efforts towards a common goal. Federal homeland security, human and animal health and other agencies collaborate to maintain in place a robust national Preparedness and Response System addressed to achieve “A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.” The country has also conducted various risk assessments on various emerging threats including Ebola and Zika among others.

Indicators and Scores

R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented

Score **5**

Strengths/ Best Practices

- Frameworks that describe roles and responsibilities have been established and are available to all.
- Operational plans that are in place identify roles and responsibilities government wide
- Risk assessments are conducted frequently to estimate capabilities and identify gap.
- The National Response Frameworks (NRF) is fundamental for preparedness and response. It covers: Prevention, Protection, Mitigation, Response or Recovery.

Areas which need strengthening/Challenges

- Incorporating modern technology platforms into emergency preparedness, including taking advantage of current social media to activate, guide and mobilize communities
- Interagency coordination for events that do not meet the threshold or criteria for a Stafford Act declaration

R.1.2 Priority public health risks and resources are mapped and utilized

Score **4**

Strengths/ Best Practices

- Federal Interagency Operational Plans (FIOP) provide Federal roles and responsibilities, specify critical tasks, and identify resourcing and sourcing requirements for delivering core capabilities
- Strategic National Risk Assessment (SNRA) compares risks for potential incidents in terms of likelihood and consequences of threats and hazards

Areas which need strengthening/Challenges

- Review and implementation of lessons learned
- Government-wide participation in exercises

Recommendations for Priority Actions

1. Incorporate emergency preparedness into technology platforms
2. Assess the impact of corrective actions implemented as a result of lessons learned

3. Address challenges with coordinating the response to complex incidents that do not receive Stafford Act declarations
4. Develop exercises that involve state and other local partners including the private sector

Emergency Response Operations

Introduction

A public health emergency operations center (EOC) is a central location for coordinating operational information and resources for strategic management of public health emergencies and emergency exercises. EOCs provide communication and information tools and services and a management system during a response to an emergency or emergency exercise. They also provide other essential functions to support decision-making and implementation, coordination, and collaboration.

Target

Countries will have a public health Emergency Operation Centre (EOC) functioning according to minimum common standards; maintaining trained, functioning, multi-sectoral rapid response teams and “real-time” biosurveillance laboratory networks and information systems; and trained EOC staff capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.

USA Level of Capabilities

The United States has developed a high level capability to activate any of the Emergency Operations Centres (EOCs) in its public health and animal sectors within the required timeframe of 2 hours. The US has developed a national framework, the National Incident Management System, and specific activation plans with a wide range of scenarios, triggers and activation levels. Situational awareness is maintained through multiple event-based surveillance systems and formal and informal exchange of information between the different agencies through liaisons officers.

Plans and procedures exist in each of the EOCs as well as MOUs between agencies to formalize collaborations. These plans integrate the need for flexibility and scalability when addressing complex health emergency issues. These procedures are reviewed both on a regular and an as-needed basis and hard copies exist in case of unavailability of the digital library. Case management procedures are available and fully implemented at the federal level for all IHR-relevant hazards but are not all consistently implemented at the state or lower level, sometimes due to inadequate resources.

Trained personnel are available for EOCs, both for steady states and when the activation requires surge human capacities to cover call-back and 24/7 coverage. The United States demonstrates a strong commitment to regular all-hazard operational exercises and constant learning and adaptation through after-action analysis of activations.

Indicators and Scores

R.2.1 Capacity to Activate Emergency Operations

Score **5**

Strengths/ Best Practices

- All hazards
- 24/7
- Continuity of operations
- Surge staff availability

- Redundant communications
- Event-based surveillance
- Liaison Officers

Areas which need strengthening/Challenges

- No substantial issues

R.2.2 Emergency Operations Center Operating Procedures and Plans

Score 4

Strengths/ Best Practices

- Plans and procedures in place
- Risk-based communications

Areas which need strengthening/Challenges

- There should be a more systematic evaluation of the resources needed at each level to ensure consistent response activation

R.2.3 Emergency Operations Program

Score 4

Strengths/ Best Practices

- Exercise and evaluation programs
- Training programs instituted
- Accredited emergency management program (EMP)

Areas which need strengthening/Challenges

- The US should look at systematically evaluating activation of its emergency response systems and developing follow up action plans

R.2.4 Case management procedures are implemented for IHR relevant hazards

Score 3

Strengths/ Best Practices

- Case management protocols have been developed effectively

Areas which need strengthening/Challenges

- The management and transportation protocols are not consistently available across all state and federal levels

Recommendations for Priority Actions

1. Standardize minimum acceptable performance criteria for federal emergency management programs and consider a formal policy regarding EMP 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 to fully implement existing federal guidelines on IHR-relevant hazards.

Linking Public Health and Security Authorities

Introduction

Public health emergencies pose special challenges for law enforcement, whether the threat is manmade (e.g., the anthrax terrorist attacks) or naturally occurring (e.g., flu pandemics). In a public health emergency, law enforcement will need to quickly coordinate its response with public health and medical officials.

Target

In the event of a biological event of suspected or confirmed deliberate origin, a country will be able to conduct a rapid, multi-sectoral 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.

USA Level of Capabilities

The United States has developed and demonstrated capacity to link public health and law enforcement, including the investigation of alleged deliberate use events. This has immensely contributed to a strong and critical component of the U.S. public health emergency preparedness and response system for the country. The Joint Criminal-Epidemiological (Crim-Epi) Investigation Model raises the awareness levels and increases collaboration between public health, law enforcement, and other sector professionals with respect to the identification, assessment, and response to biological threats, including intentional acts.

In addition, the Federal Government has made efforts to improve public health, law enforcement, and multi-sectoral response by creating frameworks/protocols and conducting training and exercises on both a national, as well as a sub-national levels. There is regularly real time information sharing between national public health and law enforcement authorities that ensures timely and the coordination of response operations. The linkage has been institutionalised through MOUs and similar arrangements exist between national and local law enforcement agencies. Enforcement systems are in place, including those at points of entry into the United States that help to prevent food, medical product, and environmental contamination, and ensure the necessary monitoring. Existing laboratory systems and networks are capable of identifying select and unknown agents.

Indicators and Scores

R.3.1 Public Health and Security Authorities, (e.g. Law Enforcement, Border Control, Customs) are linked during a suspect or confirmed biological event

Score **5**

Strengths/ Best Practices

- There are formal written agreements/MOUs are in place among all of the relevant collaborating Federal agencies
- The Joint Criminal-Epidemiological Investigations Model and its attributes mentioned above
- Timely regular information sharing coupled with Joint threat assessment, Joint investigations/interviews; Joint training/exercises.
- All situations involving the intentional use of a biological agent require a FBI-led Threat Credibility Evaluation.
- FBI and other federal law enforcement agencies maintain direct connections with the international security community including the Interpol.

Areas which need strengthening/Challenges

While the country has achieved the primary goal of implementing a multi-sectoral response to biological threats, there are opportunities for improvement:

- The primary responsibility of public health authority lies at the sub-national levels. Therefore, the FBI and state/territorial/local/tribal public health departments need unique written protocols and MOUs to elaborate on the roles in clear terms.
- There is need for continuous training, for basic and advanced level in Crim-Epi at the Federal and sub-national levels to mitigate the normal turnover in positions and retirements.

Recommendations for Priority Actions

1. Determine strategy and content for recurring basic and proposed advanced level Crim-Epi trainings at the national and subnational levels.
2. Develop FBI and sub –national (state/territorial/local/tribal) public health department jurisdiction-specific written protocol for joint public health-law enforcement investigations.

Medical Countermeasures and Personnel Deployment

Introduction

Medical Countermeasures (MCM) are vital to national security and protect nations from potentially catastrophic infectious disease threats. Investments in MCM create opportunities to improve overall public health. In addition, it is important to have trained personnel who can deploy in case of a public health emergency for response.

Target

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

USA Level of Capabilities

The United States manages robust domestic systems for the development, stockpiling, distribution, and dispensing of medical countermeasures, as well as the deployment of federal public health and medical personnel when and where they are needed. However, despite these systems, the United States recognizes that no single country can afford to make available the wide variety of medical countermeasures required to prevent or mitigate all potential threats, or ensure enough qualified personnel are available for multiple, large-scale situations. As a result, building on the expertise developed through unprecedented domestic preparedness efforts, the U.S. Government has also developed corresponding policies to address the legal, regulatory, and logistical challenges associated with transferring these resources across international borders during public health emergencies.

While the United States has a robust domestic preparedness infrastructure and substantial experience with these issues, the complexity of the challenges related to international deployments of public health assets is now being addressed. The coordination required to solve these challenges is a clear example of the many opportunities for improvement. In recognition of this fact, the United States works continuously to exercise policies and plans to receive, consider, and respond to international requests for assistance during public health emergencies. Given that U.S. health security is fundamentally linked to global health security, these cross-border policies are developed and exercised in coordination with bilateral, regional, and multilateral partners where possible.

Indicators and Scores

R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency

Score **5**

Strengths/ Best Practices

- Systems in place for development, stockpiling and deployment of medical countermeasures for use in a public health emergency are advanced and are regularly exercised and evaluated for improvement
- Collaboration prior to an event to identify all statutory, legal, and policy authorities that would impact deployment or receipt of MCMs
- Develop model liability terms and conditions for the international deployment of MCMs
- Develop processes to allow the emergency use of unapproved MCMs or unapproved use of approved MCMs during an emergency.
- Identify import and export regulations that govern the movement of MCMs
- Develop logistical processes to move shipments of MCMs rapidly

- Develop a checklist of required documents, licenses, and/or approvals necessary for the import and export of emergency MCMs
- Identify mechanisms for paying or receiving costs related to the deployment of MCMs

Areas which need strengthening/Challenges

- Maintaining capacity among state and local level health authorities to mobilize and support a public health response using MCMs
- International collaboration to develop global policies and systems for the procurement and distribution of MCMs
- Policy framework and systems for requesting and receiving MCMs into the United States during a domestic emergency
- Sustaining the long term costs for state, local, and territorial MCM capability
- Rapid deployment of MCMs internationally

R.4.2 System is in place for sending and receiving health personnel during a public health emergency—Score: #

Score 4

Strengths/ Best Practices

- Systems are in place for domestic deployment of health personnel and have been developed for sending health personnel overseas

Areas which need strengthening/Challenges

- Systems for receiving international health personnel in an emergency are not well developed
- International coordination mechanisms for deployment of health personnel in an emergency are lacking

Recommendations for Priority Actions

1. Developing 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. Working 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 and supporting the development of emergency medical teams, facilitating their deployment and improving coordination

Risk Communication

Introduction

Risk communications should be a multi-level and multi-faceted process which aims at helping stakeholders define risks, identify hazards, assess vulnerabilities and promote community resilience, thereby promoting the capacity to cope with an unfolding public health emergency. An essential part of risk communication is the dissemination of information to the public about health risks and events, such as outbreaks of diseases. For any communication about risk caused by a specific event to be effective, the social, religious, cultural, political and economic aspects associated with the event should be taken into account, as well as the voice of the affected population. Communications of this kind promote the establishment of appropriate prevention and control action through community-based interventions at individual, family and community levels. Disseminating the information through the appropriate channels is essential. Communication partners and stakeholders in the country need to be identified, and functional coordination and communication mechanisms should be established. In addition, the timely release of information and transparency in decision making are essential for building trust between authorities, populations and partners. Emergency communications plans need to be tested and updated as needed.

Target

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

USA Level of Capabilities

The United States is able to identify, develop, and disseminate public messages that rapidly and efficiently communicate risks, strategies, and actions to appropriate stakeholders and targeted populations through multi-level and multi-faceted mechanisms, processes, and tools, including social media, crowd sourcing, and other technology-based networks for information dissemination, even specifically designated for communicating with the public about health emergencies. Indeed, community engagement before, during, and after a major public health event is a component of the national approach to public health security.

The national system includes a number of plans, mechanisms, and resources to coordinate and facilitate risk communication within individual departments and agencies, as well as across the entire U.S. Government during a public health event, reasonable skilled and trained personnel and volunteers, and financial resources and arrangements, for scale up as evidenced by a simulation exercise or tested by a real health emergency.

The National Incident Communication Conference Line (NICCL) is an established network of lead communicators among the federal departments and agencies which serves to speak with a unified voice and consistent message that is coordinated not only with the different Federal authorities involved in an incident, but also with affected international, state, tribal, and local authorities as well as the parallel State Incident Communication Conference Line. For international emergencies, relevant departments and agencies who maintain relationships with WHO, other international health organizations, and foreign ministries coordinate with their counterparts.

U.S. departments and agencies have formalized functions to communicate with the public that include trained spokespersons within communication offices or divisions.

NRF Incident Communications Emergency Policy and Procedures (ICEPP) provide detailed guidance to federal incident communicators during a coordinated federal response, in order to:

- ensure that sufficient federal assets are available to provide accurate, coordinated, timely, and accessible information to audiences affected by an emergency through community engagement, social mobilization, and risk communication;
- provide pro-active, strategic communication plans and messages that anticipate and respond to public information needs in an appropriate manner;
- ensure accuracy, consistency, and timeliness so that affected individuals and communities can make sound decisions about protecting health. In the event of a terrorist incident, the FBI would be consulted before issuing sensitive media/press releases.

Communication with the public and private organizations, hospitals, and the health care sector is a significant priority in strategic communication plans and is accomplished through multiple mechanisms. Public messaging also considers community-specific needs like social, religious, cultural, political, and economic aspects related to the event. The Private Sector Incident Communications Conference Line is similar to the NICCL but includes the private companies responsible for maintaining critical infrastructure in the United States. The National Public Health Information Coalition (NPHIC) supports communication and public affairs staff from state health departments and other health risk communicators.

CDC's Crisis and Emergency Risk Communication (CERC) is a validated approach to communicating effectively during emergencies. Training material and other resources draw from lessons learned during public health emergencies and research in the fields of public health and emergency risk communication. The U.S. Government trains federal, state, private, and non-governmental partners, and other personnel. The federal government coordinates with regions, states, and urban areas to review and establish priorities for training and exercises.

Communication coordination tests and exercises are funded and performed with partner organizations; communications offices constantly monitor and audit internal and external communication channels for misinformation to quickly correct issues on a routine basis. It is common practice to complete an after-action assessment or report after completing a simulated exercise or responding to an actual emergency, to determine what actions had the most impact on changing behaviour and/or stopping the rumour from spreading. Additionally, by monitoring media and the trends in public concern, communication departments and agencies can quickly address information gaps, increase the accessibility and awareness of available information and resources, and ensure just-in-time training is available for staff, media outlets, and the public. Departments and agencies coordinate with external partners and stakeholders to develop, review, and revise response plans. Needs identified through this coordination, including those for communication response, are incorporated in agency-specific annual budget requests to ensure a successful response.

Overlapping authorities and activities during an emergency response can cause public communications to be complex.

The U.S. Government ensures that multiple languages are available, especially when media is targeting specific geographic locations or populations. Individual departments and agencies develop guidelines and teaching tools

to improve cross-cultural communications skills, and deliver culturally and linguistically appropriate messages to diverse populations.

The U.S. Government departments and agencies have staff available to manage and conduct social mobilization, health promotion, or community outreach for at-risk populations as part of the overall U.S. national response plan.

Agencies, especially those that might take the lead for a specific type of health emergency, have well developed and trained risk communications teams that are integrated into leadership and operations through both strategic and tactical activities. In large and/or complex responses, including terrorist incidents, agencies are able to collaborate and coordinate through existing incident management structures and the Joint Information Center (JIC).

Indicators and Scores

R.5.1 Risk Communication Systems (plans, mechanisms, etc.)

Score 4

Strengths/ Best Practices

- National Response Framework integrated communications in planning
- Multiple crisis and risk communication tools and templates
- Documented lessons learned
- Use of multiple communication platforms and delivery systems, technology-based networks
- Recording, reporting and implementing lessons learned into plans well established
- Accuracy is encouraged with “key message” documents, syndication of web content and coordination calls

Areas which need strengthening/Challenges

- Leaders’ understanding of their roles and responsibilities
- Speed of release of information hampered by complex coordination and clearance requirements
- More training needed to increase the number of emergency communication specialists
- Staff and volunteer expertise in community engagement
- Evidence tracking of desired behavioural changes
- Complex situations in complex, multifactorial environments (including language considerations)

R.5.2 Internal and Partner Communication and Coordination

Score 5

Strengths/ Best Practices

- The National Incident Communication Conference Line (NICCL) is an established network of lead communicators among the federal departments and agencies which serves to speak with a unified voice and consistent message

- Research regarding message preferences and population needs based on their cultural norms and relationship to the emergency
- Inclusive approach with local, state, tribal, territories and federal communicators Integrated model of crisis and risk communication (CERC) taught across governments, globally, and academic institutions

Areas which need strengthening/Challenges

- No significant issues

R.5.3 Public Communication

Score 4

Strengths/ Best Practices

- Public messaging also considers community-specific needs like social, religious, cultural, political, and economic aspects related to the event.
- The National Public Health Information Coalition (NPHIC) supports communication and public affairs staff from state health departments and other health risk communicators.

Areas which need strengthening/Challenges

- Overlapping authorities and activities during an emergency can cause public communication activities to be complex

R.5.4 Communication Engagement with Affected Communities

Score 3

Strengths/ Best Practices

- Community message strategies are targeted and proactive

Areas which need strengthening/Challenges

- Mechanism to harness scale up capacity in an emergency to build community resilience
- Exercises and simulations focused on community engagement

R.5.5 Dynamic Listening and Rumour Management

Score 4

Strengths/ Best Practices

Continual monitoring of social media during a crisis gives early understanding of community desires

Areas which need strengthening/Challenges

- Consider evaluation of impact of communication messages to demonstrate evidence of behaviour change

Recommendations for Priority Actions

1. Strengthen the risk communication professional discipline with 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 behaviour change messages

OTHER

Points of Entry

Introduction

All core capacities and potential hazards apply to Points of Entry (POE) and thus enable the effective application of health measures to prevent international spread of diseases. States Parties are required to maintain the core capacities at the designated international airports and ports (and where justified for public health reasons, a State Party may designate ground crossings) which will implement specific public health measures required to manage a variety of public health risks.

Target

States Parties should designate and maintain the core capacities at the 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.

USA Level of Capabilities

The United States has effective system to detect, assess, report and respond to potential threats and events at points of entry (PoE). The Memorandum of Understanding exists with relevant stakeholders (CDC, DHS CBP, DHS ICE and the USCG) to share the information regarding travellers' health, medical services, and disease reporting. Public health activities at those locations include coordination and collaboration among local public health departments, area medical providers, law enforcement, emergency medical services, airlines, and port operators. There are quarantine stations at designated PoEs, which provide public health consultations and investigations, medical examinations and immediate treatment, and facilitate the transfer of sick travellers to definitive care (170 hospitals). CDC issues guidelines for the protection of travellers and to prevent introduction of communicable diseases into the United States.

USDA is responsible for inspection of specific food items, and FDA is responsible for inspections of all other food and ingredients as well as medical products. Both agencies have specific authorities to detain, test, or confiscate material to prevent hazardous or contaminated material from entering the United States. CDC, the United States Coast Guard (USCG) and U.S. Navy are authorized to issue Ship Sanitation Control Certificates and Ship Sanitation Control Exemption Certificates.

There are some limitations at the non-designated ports in respect of on-site access to specialized public health officers and the capacity to detect, assess, report and response capacity. Development of this capacity and regular exercise programs could benefit for further enhancing the capacities at PoEs. The report by the Government Accountability Office highlighted the needs of a comprehensive national aviation preparedness plan aimed at preventing and containing the spread of diseases that would include PoE not already covered by the CDC.

Indicators and Scores

PoE.1 Routine capacities are established at PoE

Score **4**

Strengths/ Best Practices

- Memorandum of Understanding exists with relevant stakeholders for mechanism to share the information of travellers' health and medical services and diseases reporting and with good coordination mechanism in place.
- There are CDC quarantine stations at the IHR designated POE and Ial POE have SOPs to transfer travellers to the designated medical facilities (170 facilities)
- Adequate legislation is in place for quarantine and isolation and there is also provision for other measures to prevent entry and spread of communicable diseases
- POE have capacities for detecting, assessing and reporting illnesses; screening cargo, animals and animal products; and monitoring the health of suspected cases of an illness
- Air crews have an obligation to report immediately to air traffic control about any deaths or seriously ill persons.
- Provision of PoE inspection and public safety exists (vector control and vessels sanitation program assist to prevent and control the introduction and spread of diseases for ships (conveyances)
- CDC is the competent authority under the IHR(2005) to issue Ship Sanitation Control Certificate and Exemption Certificate
- FDA has authority to inspect regulated food and medical products and also visits in exporting countries to inspect animal and food products.
- USDA has capacity and authority for animal quarantine at PoE with designated 3 holding sites. (Animals go through Animal import centers or sea-port. USDA has inspections and temporary quarantines for that. 3 holding facilities across the country)

Areas which need strengthening/Challenges

- The limited on-site access to specialized public health officers at other non-designated ports (land, air and ports)
- Capacity to detect, assess, report and response capacity at the non-designated ports (ground, sea and air)

PoE.2 Effective Public Health Response at Points of Entry

Score 5

Strengths/ Best Practices

- Communicable disease response plans in place for the 18 PoEs with quarantine stations
- Regular exercises with local, state, and federal emergency response and airport partners.
- There are systems in place to safely transfer patients for medical care (170 hospitals located near PoE and CDC and the mechanism of notification to CDC EoC)
- In the light of the Ebola experience, monitoring of patients and other activity at POE is seen as part of a continuum of care, rather than just being a port issue.

Areas which need strengthening/Challenges

- Expansion of the exercise programs to other non-designated ports.
- Need for a comprehensive national aviation-preparedness plan aimed at preventing and containing the spread of diseases that would include PoE not already covered by CDC.

- Ensuring there are facilities available to allow the prompt assessment and care of ill travelers

Recommendations for Priority Actions

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

Chemical Events

Introduction

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

Target

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

USA Level of Capabilities

The United States has considerable preparedness and response capacity for chemical events with functioning mechanisms established for detecting and responding to emergencies. Any federal responses to chemical events or threats are carried out by EPA, FEMA and USCG with the support of 13 other federal departments and agencies. Relevant departments and agencies maintain operational plans and procedures for chemical event responses. The US has participated in a number of international treaties, conventions and protocols for the control of hazardous chemicals and materials as well as non-proliferation.

There is significant capacity for baseline public health assessment to inform national, state and local strategies, guidelines, plans, and protocols for chemical threats and event response. Although the states' capacities vary, the federal government provides resources to support state and local preparedness. The country has experience of dealing with various chemical event responses and lessons learnt are regularly used to improve plans and develop new approaches. Federal Interagency Working Group led by the DHS Assistant Secretary for the Office of Infrastructure Protection, the DOL's Assistant Secretary for OSHA, and the EPA Assistant Administrator for the Office of Land and Emergency Management issued a report in 2014 with an aggressive Action Plan focused on changing the national landscape of chemical facility safety and security.

Laboratory capacity for identification of chemical intoxication needs further strengthening. Further strengthening of waste management capacity with the development of a regular monitoring system would make the system very robust. There are shortages of trained personnel for the management and response to chemical emergencies. The development of multiagency plans and strategies based on the chemical properties and hazards, and strengthening of community planning and preparedness at the local level would further enhance capacity.

Indicators and Scores

CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies

Score **4**

Strengths/ Best Practices

- The country has the capacity of event detection (sentinel surveillance, environmental monitoring, and consumer product monitoring chemical hazards; reporting of releases of reportable quantities of listed hazardous substance.
- Country has significant laboratory capacity with 53 level 3 labs, 34 level 2 labs, 10 level 1 labs with provision of surge capacity and availability of mobile portable high throughput integrated laboratory.
- A network of Poison Control Centres across the country linked through database, which provides information about situations.
- Regular conduction of baseline public health assessment to inform national, state and local strategies, guidelines, plans, and protocols for chemical event response
- The emergency planning and community right to know act created to help communities plan for emergencies involving hazardous substances addressing emergency planning & notification (Substances and facilities covered and notification), comprehensive emergency response plan, emergency training and review of emergency systems, reporting requirements, provision of information to health professional, doctors, and nurses, community right to know requirements, toxics release inventor, trade secrets and enforcement.
- Capacity for risk assessment and exposure monitoring exists, such as CDC ATSDR assessment of chemical exposures, the CDC community assessment for PH emergency response, and the EPA hazard monitoring system. CDC collaborates with American Association of Poison Control Centres via national poison data system.
- Capacity to mitigate and treatment of effect of chemical hazards with availability of inventory health facilities and chemical hazards emergency contacts.
- Most chemical protective equipment is either certified by a national entity or designed to meet certain specifications.
- 1960 chemical hazards resource containers, called CHEMPACKs, are available around the country, with more than 90% accessible within one hour.
- Private sector contributes significantly during chemical event preparedness and response through various mechanisms (e.g. Chemical Transportation Emergency Centre – CHEMTREC etc.)

Areas which need strengthening/Challenges

- Consistency of laboratory capacity for identification of chemical intoxication needs further strengthening
- Development of best practices for the waste management.

CE.2 Enabling environment is in place for management of chemical Events

Score 5

Strengths/ Best Practices

- The country has the national contingency plan for oil and hazardous substances, which has coordination and communication mechanism with state and local agencies. (This plan has established 13 Regional Response Teams consisting of regional representative of the 16 agencies comprising the National Response Team and the states within that region. The Regions include the 10 standard federal regions plus 3 additional teams to address the different organizations of the federal agencies involved)
- The country has well developed mechanism for the regulation for chemical hazards, with experts and resources available for chemical emergency management and preparedness and response efforts.

- Relevant department and agencies have specific operational plans and procedures for chemical event responses.
- Agency-specific lists and mechanisms are in place to identify and contact the appropriate experts across the US government.
- The country also participates in a number of international treaties, protocols, and conventions for the control of hazardous chemicals and materials.
- DOT has comprehensive authority to regulate hazardous materials for transportation in and out of country.
- Funding to support federal, state, and local government emergency response activities is available under Stafford Act or the National Oil and Hazardous Substances Pollution Contingency Plan. HHS also provides funding and manages development, acquisition, and stockpiling of medical countermeasures.
- Country regularly conducts exercises, simulations, and real event response (Deepwater Horizon in 2010, Elk River incident), every year that relate to chemical events. FEMA has dedicated unit for national exercise division, which conducts exercises. These exercises are evaluated and lessons learned are incorporated.

Areas which need strengthening/Challenges

- States are facing shortages of trained human resources, who are aware of chemical emergency management plan and respond to the large scale emergencies.
- Use feedback from stakeholders in an evidence based way in order to develop best practices
- Strengthening community planning and preparedness at the local level.
- Development of multiagency plans and strategies depending on the chemical properties and hazards.

Recommendations for Priority Actions

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. Expanding the number of the trained personnel who can manage larger-scale emergencies

Radiation Emergencies

Introduction

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

Target

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

USA Level of Capabilities

The United States has strong, multi-sector approach to prepare for and respond to radiological and nuclear emergencies. The federal government provides assistance to state and local governments as needed on the premise that events would be handled at the local level until they exceed the capability of the local jurisdiction.

The National Response Framework (NRF) contains the Nuclear/Radiological Incident Annex (NRIA), which outlines the roles, responsibilities, and authorities for the federal agencies that have responsibilities during an emergency response. The capabilities of local governments vary widely across the United States, with the greatest resources found in states that have nuclear facilities. The overall coordination of response to any significant radiological/nuclear emergency would be carried out by DHS and FEMA, in close coordination with the White House NSC Staff. The FBI would also take lead actions if the incident were the result of terrorism or other federal crimes. The United States is a signatory to the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency coordinated by the International Atomic Energy Agency (IAEA).

The United States, like most countries, would be challenged to respond to a large-scale, catastrophic nuclear emergency. Evaluation and testing of the identified roles and responsibilities of authorities as described in the NRIA, and updating it as appropriate, would be of value. Mechanism can be established to establish systematic information exchange between radiological competent authorities and human health service units. Waste management of radio-nuclear waste with development of long term repository mechanism with appropriate monitoring systems is crucial for radiation safety. There are depleting trend of radiation and radiobiology professionals.

Indicators and Scores

RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies

Score 3

Strengths/ Best Practices

- Radiation detection exists in the country with defined responsibilities of various authorities (e.g. EPA does for radiation in environment; DHS Biowatch system, multiple agencies like FDA, USDA and DHS responsibility for monitoring consumer products with the laboratory support; Department of Energy monitors the incident and radiation through aerial measuring system)

- There is a comprehensive system of protection in place for radiological and nuclear hazards with scalable national response plans
- The capacity for conducting risk assessment and exposure monitoring mechanism in place (CDC provides assistance and support to state and local government for monitoring of exposed population and post incident health surveillance, DOE led FRMAC coordinates the collection and assessment of radiological data immediately after emergencies)
- Regular exercises allow Federal, State and local agencies, as well as the nuclear power operators, to test both national and local plans and maintain a level of readiness through integrated communication and capabilities across the levels and sectors
- Mechanism have been developed for mitigation and treatment following radiation events (for example, FDA publishes various guidance documents, Radiation Injury treatment network to care for patients due to radiological events with guidance on various possible events)
- Radiation Emergency Assistance Center/Training Site and DOD's Armed Forces Radiobiology research institute serve as medical resources
- The DHS FEMA RadResponder network enables organizations to rapidly and securely record, share, and aggregate large quantities of data while managing their equipment, personnel, interagency partnerships, and multijurisdictional event spaces.

Areas which need strengthening/Challenges

- Human health risk assessment or characterizing the human impact from a radiation emergencies
- Limited capacity of laboratories to conduct bioassays for internal radioactive contamination or bio-dosimetry for the assessment of external radiation exposure
- System information exchange mechanism between radiological competent authorities and human health surveillance units

RE.2 Enabling environment is in place for management of Radiation Emergencies

Score 3

Strengths/ Best Practices

- The Nuclear Radiological Incident Annex (NRIA) outlines the roles, responsibilities and authorities for federal agencies during radiation emergencies (federal government provides assistance and support to state and local government as needed)
- Various stakeholders played crucial role on the management of radiation emergencies (Federal Radiological Monitoring and Assessment Center led by DOE and EPA and supported by other Federal, state, and local agencies; the Advisory Team for Environment, Food, and Health, comprised of technical representatives from EPA, FDA, CDC, and USDA; State and local response agencies including radiation control programs.)
- A well-developed network of assets and plans exists for sampling, monitoring and assessing risks to the food supply and the environment.
- US government has used lessons learned from regular exercises and various incidents to refine strategies and setting up priorities (Lessons learnt from the Fukushima incident particularly on equipment and the communication risk to the public are essential)
- The CDC National Center for Environmental Health (Division of Environmental Hazards and Health Effects/Radiation Studies Branch) and the DOE Radiation Emergency Assistance Center/Training Site are

Collaborating Centers for radiation emergencies with the WHO Radiation Emergency Medical Preparedness and Assistance Network.

Areas which need strengthening/Challenges

- Evaluate and test the identified roles and responsibilities of authorities as described in the Nuclear Radiological Incident Annex (NRIA) and, where appropriate, update them.
- Improve the availability and sustainability of experienced radiation and radiobiology professionals
- Conduct realistic wide scale drills that test the ability to assist and support state and local communities.

Recommendations for Priority Actions

1. Establish mechanism for systematic information exchange between radiological competent authorities and HHS surveillance unit
2. Develop the long term waste management repository following the cleanup of a radiological spill
3. Research, development and implementing systems are needed to create novel, high-throughput systems that are capable of performing bio-dosimetry and bioassay in both mass casualty and large scale radionuclide dispersion situations
4. Implementation of 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.

Appendix 1: Joint External Evaluation Background

Mission Place and Dates

Washington DC, May 23-24 2016

Atlanta, May 25-27 2016

Mission Team Members:

- Simo Nikkari, Finland, Finnish Defence Forces (Team Lead)
- Issa Makumbi, Uganda, Ministry of Health (Team Co-Lead)
- Stefania Iannazzo, Italy, Ministry of Health (Team Member)
- Ernesto Gozzer, Peru, National Institute of Health Peru (Team Member)
- Nirmal Kandel, World Health Organization (Team Member)
- Wantanee Kalpravidh, Food and Agriculture Organization (Team Member)
- Anna Katz, Finland, Finnish Defence Forces (Team Member)
- Clément Lazarus, France, Ministry of Health (Team Member)
- Elizabeth Lule, World Bank (Team Member)
- Brian McCloskey, the United Kingdom, Public Health England (Team Member)
- Ndekya Oriyo, Tanzania, National Institute for Medical Research Tanzania (Team Member)
- Zeinab Roka, Kenya, Ministry of Health (Team Member)
- Adam Roth, Sweden, The Public Health Agency of Sweden (Team Member)
- Elizabeth Jane Soepardi, Indonesia, Ministry of Health (Team Member)
- Jukka Lähesmaa, Finland, Ministry of Health (Observer)

Objective

To assess (Host Country's) capacities and capabilities relevant for the 19 Technical Areas of the JEE tool in order to provide baseline data to support (Host Country's) efforts to reform and improve their public health security.

The JEE Process:

The Joint External Evaluation process is a peer-to-peer review. As such, it is a collaborative effort between host country experts and External Evaluation Team members. The entire external evaluation, including discussions around the scores, the strengths, the areas that need strengthening, best practices, challenges and the priority actions should be collaborative, with external evaluation team members and host country experts seeking full agreement on all aspects of the final report findings and recommendations.

Agenda of the External Assessment

Monday, May 23, 2016 Washington DC

- Opening
- Opening remarks from USG Leadership
- Opening remarks from External Assessment Team Leader
- U.S. Approach to the JEE self-assessment
- Overview of U.S. Public Health System
- JEE technical area discussions: National legislation, policy & finance, IHR coordination, communication and advocacy, Reporting, Preparedness
- Site visit: HSS Secretary's operations center

Tuesday, May 24, 2016 Washington DC

- JEE technical area discussions: Zoonotic diseases, Food safety, Medical countermeasures & personnel deployment, Biosafety & biosecurity, Radiation emergencies, Chemical events
- Site visits: Virtual tours Department of Interior, Department of Agriculture

Wednesday, May 25, 2016 Atlanta

- Introductory remarks
- JEE technical area discussions: Risk communication, Emergency operations centres, Points of entry, Health & security
- Site visits: Emergency operations center
- Zika response presentation

Thursday, May 26, 2016 Atlanta

- JEE technical area discussions: National laboratory system, Real-time surveillance, Antimicrobial resistance, Immunization, Workforce development
- Flint, Michigan response presentation

Friday, May 27, 2016 Atlanta

- Site visits: Laboratory tour
- External assessment team huddle - presentations for outbrief
- Outbrief from the external assessors
 - External team lead outbrief
 - Outbriefs of each JEE technical area
- Closing
- Closing remarks from USG Leadership

Limitations and Assumptions

- The assessment was limited to one week, which limited the amount and depth of information which could be managed.
- It is assumed that the results of this assessment will be made publically available.
- The assessment is not an audit and information provided by USA will not be independently verified. Information provided by USA will be discussed and the Host Country and assessment team will mutually agree an assessment rating. This is a peer-to-peer review.

Key Host Country Participants

USG Leadership

- Nicole Lurie, Assistant Secretary for Preparedness and Response, Department of Health and Human Services
- Tom Frieden, Director, U.S. Centers for Disease Control and Prevention
- Elizabeth Lautner, Associate Deputy Administrator for Science, Technology and Analysis Services, Department of Agriculture

- Annie Hall, Acting Principal Deputy Assistant Security for the Bureau of Oceans and International and Environmental Affairs, Department of State
- Laura Holgate, Special Assistant to the President for Weapons of Mass Destruction, Terrorism and Threat Reduction

The U.S. chairperson during the external assessment was Maria Julia Marinissen, Director of the Division of International Health Security, Office of Policy and Planning, Office of the Assistant Secretary for Preparedness and Response (HHS). The U.S. Assessment project leader was Christopher Perdue, Branch Chief for International Health Regulations, also in the ASPR Division of International Health Security.

The full list of USG participants is included below.

Host Country Institutions

Department of Health and Human Services

- Office of the Assistant Secretary for Preparedness and Response
- U.S. Centers for Disease Control and Prevention
- U.S. Food and Drug Administration
- Health Resources and Services Administration
- National Institutes of Health
- National Vaccine Program Office
- Office of the Assistant Secretary for Global Affairs
- Office of the Assistant Secretary for Public Affairs

Department of Agriculture

Department of Defense

Department of Energy

Department of Justice

- Federal Bureau of Investigation

Department of Homeland Security

Department of the Interior

Department of Labor

- Occupational Health and Safety Administration

Department of State

Department of Transportation

Department of Veterans Affairs

Environmental Protection Agency

Nuclear Regulatory Commission

U.S. Agency for International Development

White House Executive Office

- Office of Management and Budget
- National Security Council Staff

Supporting Documentation Provided by Host Country

- International Health Regulations – Joint External Evaluation of the United States of America, Self-Assessment Report, May 5, 2015
- Presentation on the U.S. Self-Assessment
- Presentation on Overview of U.S. Public Health System
- Presentations on each of the 19 JEE technical areas

U.S. Government JEE Planning Team

FULL NAME	TITLE (DEPARTMENT/AGENCY)
Christopher Perdue	International Health Regulations Branch Chief, Division of International Health Security (HHS/ASPR)
Cody Thornton	IHR Program Manager, International Health Regulations Branch (HHS/ASPR)
Maria Julia Marinissen	Director, Division of International Health Security (HHS/ASPR)
Christine Kosmos	Director, Division of State and Local Readiness, Office of Public Health Preparedness and Response (HHS/CDC)
James B. Crockett	Emergency Management Specialist, Division of State and Local Readiness (HHS/CDC)
Theresa Smith	Associate Director for Science, Division of State and Local Readiness (HHS/CDC)
Anjali Patel	Senior Consultant, Deloitte
Claire Pelura	Consultant, Deloitte
Katherine S. Gudgel Williams	Public Health Analyst, Office of Public Health Preparedness & Response (HHS/CDC)
Jerusha Murugen	Senior Management Analyst, International Health Regulations Branch (HHS/ASPR)
Daniel Finan	Program Analyst, International Health Regulations Branch (HHS/ASPR)
Julie Barsic	Senior Management Analyst, International Partnerships (HHS/ASPR)
Carolyn Stevens	Senior Executive Assistant to the Director, Division of International Health Security (HHS/ASPR)

U.S. Department and Agency JEE Leads

FULL NAME	TITLE (DEPARTMENT/AGENCY)
Todd Anderson	Director, Cooperative Threat Reduction Policy (DOD)
Joe Anelli	Director, One Health Coordination Center (USDA/APHIS)
Daniel Blumenthal	Consequence Management Program Manager, National Nuclear Safety Administration (DOE)
Elaine Bond	Public Health Emergency Planner & Lead for DOI One Health Group (DOI)
Christopher Brown	Safety & Occupational Health Scientist, Office of Emergency Management & Preparedness (HHS/OSHA)
Cayce Parrish	Senior Advisor, Office of Homeland Security (EPA)
Justin Cormier	Program Examiner, International Affairs Division (OMB)
Brooke Courtney	Senior Regulatory Counsel, Office of Counterterrorism and Emerging Threats (HHS/FDA)
James B. Crockett	Emergency Management Specialist, Division of State and Local Readiness (HHS/CDC)
Greg Davis	Senior International Health Officer, Office of Global Health Affairs (HHS/HRSA)
Jose Fernandez	Global Health Security Agenda Team Lead, Office of Pandemics and Emerging Threats (HHS/OGA)
Stephanie Flugge	Outbreak Coordinator, One Health Coordination Center (USDA/APHIS)
Bruce Gellin	Director, National Vaccine Program Office (HHS/OASH)
Mark Gentilman	Deputy Director for Civil Military Medicine, Defense Health Agency (DoD)
Irizarry Gilberto	Director, Preparedness & Response Operations Division (EPA)
Bill Hall	Deputy Assistant Secretary for Public Affairs for Public Health (HHS/ASPA)
Wendy Hall	Special Senior Advisor for Biological Threat (DHS)
Camille Harris	Fish & Wildlife Disease Coordinator, Office of Ecosystems (DOI/USGS)

Larry Kerr	Director, Pandemics and Emerging Threats (HHS/OGA)
Carmen Maher	Acting Assistant Commissioner for Counterterrorism Policy and Acting Director of the Office of Counterterrorism and Emerging Threats (HHS/FDA)
Andrew McBrearty	Preparedness Planner, Office of Emergency Management & Resilience (VA)
Patricia Milligan	Senior Advisor, Office of Nuclear Security and Incident Response (NRC/DPR)
Jean Otto	Senior Epidemiologist, Armed Forces Health Surveillance Center (DOD)
Christopher Perdue	Chief, International Health Regulations Branch (HHS/ASPR)
Karen Pulsifer	Planning and Preparedness Branch Chief, Office of Emergency Management & Resilience (VA)
Lewis Ratchford Jr.	Deputy Assistant Secretary, Emergency Management and Resilience (VA)
Jennifer Seedorff	Foreign Affairs Officer, International Health and Biodefense (DOS)
Patricia Schmitt	Senior Public Health Advisor, Office of Global Health (USAID)
Selwyn Jameson	Bioterrorism Prevention Program Manager, Weapons of Mass Destruction Directorate (DOJ/FBI)
Lynn Slepski	Senior Public Health Advisor, Office of Intelligence, Security and Emergency Response (DOT/OST)
Theresa Smith	CAPT, United States Public Health Service, Special Advisor for Joint External Evaluation, Office of Public Health Preparedness and Response (HHS/CDC)
Cody Thornton	IHR Program Manager, International Health Regulations Branch (HHS/ASPR)
Carrie Wolinetz	Associate Director for Science Policy and Director of the Office of Science Policy (HHS/NIH)
Ivan Zapata	Global Health Security Advisor, Office of Health Affairs (DHS)

Writing Team for the 1st Draft of the U.S. JEE Self-Assessment Report

FULL NAME	TITLE (DEPARTMENT/AGENCY)
Ray Arthur	Director, Global Disease Detection Operations Center (HHS/CDC)
Kerre Avery	Emergency Management Specialist, Division of Emergency Management (HHS/CDC)
Richard Balliram	Public Health Analyst, International Partnerships Branch (HHS/ASPR)
Casey Barton Behraves	Director, One Health Office (HHS/CDC)
Brent Davidson	Chief, International Assistance and Response Policy (HHS/ASPR)
Daniel Finan	Program Analyst, International Health Regulations Branch (HHS/ASPR)
Stephanie Flugge	Outbreak Coordinator, One Health Coordination Center (USDA/APHIS)
Kevin Gallagher	Emergency Personnel Staffing Team Lead, Division of Emergency Operations (HHS/CDC)
Lauri Hicks	Medical Epidemiologist, Division of Healthcare Quality Promotion (HHS/CDC)
John Koerner	Chief, Chemical, Biological, Radiological, Nuclear or High-Yield Explosive Branch (HHS/ASPR)
Theresa Lawrence	Director, Division of Biosafety, Biosecurity, and Countering Biological Threats (HHS/ASPR)
Arthur Liang	Senior Advisor for Food Safety, National Center for Emerging and Zoonotic Infectious Diseases (HHS/CDC)
John Lisco	Deputy Director, Division of Scientific Education and Professional Development (HHS/CDC)
Eric Morrissey	Program Integration Unit, Center for Surveillance, Epidemiology and Laboratory Services (HHS/CDC)
Michael Noska	Radiation Safety Officer and Senior Advisor for Health Physics (HHS/FDA)
Stephen Papagiotas	Public Health Advisor, Division of Preparedness and Emerging Infections

	(HHS/CDC)
Jean Patel	Deputy Director, Office of Antimicrobial Resistance (HHS/CDC)
Benjamin Park	Chief, International Infection Control Program, Division of Healthcare Quality Promotion, (HHS/CDC)
Christopher Perdue	Chief, International Health Regulations Branch (HHS/ASPR)
Barbara Reynolds	Senior Advisor, Crisis and Risk Communication, Office of the Director (HHS/CDC)
John Ridderhof	Senior Advisor, Division of Laboratory Systems (HHS/CDC)
Lee Smith	Communications, Preparedness, Response and Training Team Lead, Division of Global Migration and Quarantine (HHS/CDC)
Jason Stear	Policy and Issues Management Team Lead, Strategic National Stockpile, Office of Public Health Preparedness and Response (HHS/CDC)
Shannon Stokley	Associate Director for Science, Immunization Services Division (HHS/CDC)
Jason Thomas	CDC Biosurveillance Coordinator, Center for Surveillance, Epidemiology, and Laboratory Services (HHS/CDC)
Cody Thornton	International Health Regulations Program Manager, International Health Regulations Branch (HHS/ASPR)
Paige Waterman	Deputy Director, Global Emerging Infections Surveillance (DOD/AFHSB)

U.S. JEE Presenters & Panelists

FULL NAME	TITLE (DEPARTMENT/AGENCY)
Steve Adams	Deputy Director, Division of Strategic National Stockpile (HHS/CDC)
Nancy Anderson	Chief, Laboratory Practice and Standards Branch (HHS/CDC)
Joe Anelli	Director, One Health Coordination Center (USDA/APHIS)
Ray Arthur	Director, Global Disease Detection Operations Center (HHS/CDC)
Lori Bane	Associate Director for Policy, Division of Select Agents and Toxins (HHS/CDC)
Maureen Bartee	Associate Director, Division of Global Health Protection (HHS/CDC)
Casey Barton Behravesh	Director, One Health Office (HHS/CDC)
Dan Beck	Director, Readiness and Deployment Operations (HHS/OASH)
Marshal Bickert	Emergency Management Specialist, Response Operations (HHS/ASPR)
Eric Blank	Senior Director, Public Health Systems (Association of Public Health Laboratories)
Joe Bresee	Acting Deputy Director, National Center for Immunizations and Respiratory Diseases (HHS/CDC)
Christopher Brown	Safety & Occupational Health Scientist, Office of Emergency Management & Preparedness (HHS/OSHA)
Jeff Bryant	Director, Division of Emergency Operations (HHS/CDC)
Carole Cameron	Director, Office of International Affairs (DHS/FEMA)
Christa Capozzola	Chief Financial Officer, Office of Financial Resources (HHS/CDC)
Susan Cibulsky	Senior Policy Analyst, Medical Countermeasure Strategy and Requirements Division (HHS/ASPR)
Norman Coleman	Associate Director, Radiation Research Program (HHS/NIH)
Mike Coletta	National Syndromic Surveillance Program Manager, Division of Health Informatics and Surveillance (HHS/CDC)
Brooke Courtney	Senior Regulatory Counsel, Office of Counterterrorism and Emerging Threats (HHS/FDA)
Carol Crawford	Digital Media Branch Chief, Office of the Associate Director (HHS/CDC)

John Cronier	Special Agent, Weapons of Mass Destruction Coordinator (DOJ/FBI)
Brent Davidson	Chief, International Assistance and Response Policy Branch (HHS/ASPR)
Bradley Dickerson	Director, Chemical Security Policy and Senior Science Policy Advisor (DHS)
Edward Dieser	Deputy Associate Director for Emergency Management, National Center for Environmental Health (HHS/CDC)
Jeff Engel	Executive Director (Council of State and Territorial Epidemiologists)
Emilo Esteban	Executive Associate for Lab Services (USDA/FSIS)
Jessica Fantinato	Deputy Director, Office of Emergency Management (HHS/ASPR)
April Finnen	Senior Health Communications Specialist, Office of Counterterrorism and Emerging Threats (HHS/FDA)
Aaron Firoved	Acting Director, National Biosurveillance Integration Center (DHS/OHA)
Robert Fisher	Director, Regulatory Science, Office of Counterterrorism and Emerging Threats (HHS/FDA)
Renee Funk	Acting Associate Director, Office of Environmental Health Emergency Management (HHS/CDC)
Kevin Gallagher	Emergency Personnel Staffing Team Lead, Division of Emergency Operations (HHS/CDC)
Bruce Gellin	Director, National Vaccine Program Office (HHS/OASH)
Kathleen Gensheimer	Director, Coordinated Outbreak Response and Evaluation (HHS/FDA)
Maleeka Glover	Senior Epidemiologist, Medical Investigations Team (HHS/CDC)
David Goldman	Assistant Administrator, Office of Public Health Science (USDA/FSIS)
John Griggs	Director, National Analytical Radiation Environmental Laboratory (EPA/ORIA)
Bill Hall	Deputy Assistant Secretary for Public Affairs for Public Health (HHS/ASPA)
Wendy Hall	Special Senior Advisor for Biological Threat (DHS)
Angela Harless	Communications Coordinator, Office of Communications (USDA)
Victor Harper	Director, Division of Logistics (HHS/ASPR)
Camille Harris	Fish & Wildlife Disease Coordinator, Office of Ecosystems (DOI/USGS)
Burke Healey	Executive Director, Surveillance, Preparedness & Response Services (USDA/APHIS)
Lesliann Helmus	Program Manager, National Notifiable Diseases Surveillance System (HHS/CDC)
Lauri Hicks	Medical Epidemiologist, Division of Healthcare Quality Promotion (HHS/CDC)
Kristin Holt	Food Safety and Inspection Service Liaison to CDC (USDA/FSIS)
Jennifer Hornsby-Myers	Industrial Hygienist, National Institute for Occupational Safety and Health (HHS/CDC)
Adam Horsley	Attorney, Hazardous Materials Safety Law Division (DOT/PHMSA)
Michael Iademarco	Director, Center for Surveillance, Epidemiology, and Laboratory Services (HHS/CDC)
Joselito "Lito" Ignacio	Chemical, Biological, Radiological, and Nuclear Science Advisor (DHS/FEMA)
Hamid Jafari	Medical Officer, Global Immunization Division (HHS/CDC)
Candi Jones	Branch Chief, Health Incident Surveillance (DHS)
Estella Jones	Senior Regulatory Veterinarian, Office of Counterterrorism and Emerging Threats (HHS/FDA)
Alexander Kallen	Lead, Antimicrobial Resistance and Emerging Pathogens Team (HHS/CDC)

Mark Kirk	Director, Chemical Defense Program (DHS/OHA)
John Koerner	Chief, Chemical, Biological, Radiological, Nuclear or High-Yield Explosive Branch (HHS/ASPR)
Katrin Kohl	Deputy Director, Division of Global Migration and Quarantine (HHS/CDC)
Donna Knutson	Acting Deputy Director, Agency for Toxic Substances and Disease Registry (HHS/CDC)
Wendi Kuhnert-Tallman	Associate Director for Lab Science, National Center for Emerging and Zoonotic Infectious Diseases (HHS/CDC)
Elizabeth Lautner	Associate Deputy Administrator, Science, Technology and Analysis Services (USDA/APHIS)
Katherine Lyon Daniel	Associate Director for Communications, Office of the Associate Director for Communication (HHS/CDC)
Mike Mair	Director of Strategic Operations, National Antimicrobial Resistance Monitoring System (HHS/FDA)
Maria Julia Marinissen	Director, Division of International Health Security (HHS/ASPR)
Thomas McKenna	District Director, Surveillance, Preparedness, and Response Services (USDA/APHIS)
Jennifer Mcquiston	Deputy Director, Division of High Consequence Pathogens and Pathology (HHS/CDC)
Toby Merlin	Director, Division of Preparedness and Emerging Infections (HHS/CDC)
Patricia Milligan	Senior Advisor, Office of Nuclear Security and Incident Response (NRC/DPR)
Ron Miller	Acting Director, National Disaster Medical System (HHS/ASPR)
Eric Morrissey	Program Integration Unit, Center for Surveillance, Epidemiology and Laboratory Services (HHS/CDC)
Andrei Nabakowski	Acting Director, Office of Emergency Operations (HHS/FDA)
Kerry Nesseler	Assistant Surgeon General, Director of the Office of Global Health (HHS/HRSA)
Rich Nickle	Environmental Health Scientist, Emergency Response Program (HHS/CDC)
Michael Noska	Radiation Safety Officer and Senior Advisor for Health Physics (HHS/FDA)
Stephen Papagiotas	Public Health Advisor, Division of Preparedness and Emerging Infections (HHS/CDC)
Benjamin Park	Chief, International Infection Control Program, Division of Healthcare Quality Promotion, (HHS/CDC)
Robert Parker	Deputy Associate Chief Counsel (DHS)
Jean Patel	Deputy Director, Office of Antimicrobial Resistance (HHS/CDC)
Matthew Penn	Director, Public Health Law Program, Office for State, Tribal, Local and Territorial Support (HHS/CDC)
Christopher Perdue	Chief, International Health Regulations Branch (HHS/ASPR)
Andrei Perlloni	Consumer Safety Supervisor, Center for Drug Evaluation and Research (HHS/FDA)
Harald Pietz	Deputy Director, Division of State and Local Readiness (HHS/CDC)
Satish Pillai	Deputy Incident Manager Zika Response (HHS/CDC)
Jennifer Ray-Gorrie	Senior Attorney, Office of General Counsel (HHS)
James Remington	Program Analyst, Public Health Preparedness Training (HHS/NIH)
Barbara Reynolds	Senior Advisor, Crisis and Risk Communication, Office of the Director (HHS/CDC)
Molly Rickard	FBI/CDC Crim-Epi Investigations Program Manager (DOJ/FBI)
John Ridderhof	Senior Advisor, Division of Laboratory Systems (HHS/CDC)

Brian Schlieger	Preparedness and Removal Team Lead (EPA)
Andy Scott	Senior Radiological/Nuclear Health Advisor, Health Threats Resilience Division (DHS/OHA)
Eric Sergienko	DOD Liaison to CDC (DOD/Navy)
Susan Sherman	Senior Attorney (HHS/OGC)
Pattie Simone	Director, Division of Scientific Education and Professional Development (HHS/CDC)
Andrew Slaten	Deputy Director, Office of International Affairs (DHS/FEMA)
Jonathan Sleeman	Director, National Wildlife Health Center (DOI/USGS)
Lynn Slepski	Senior Public Health Advisor, Office of Intelligence, Security and Emergency Response (DOT/OST)
Lee Smith	Team Lead, Communications, Preparedness, Response and Training, Division of Global Migration and Quarantine (HHS/CDC)
Jason Stear	Policy and Issues Management Team Lead, Strategic National Stockpile, Office of Public Health Preparedness and Response (HHS/CDC)
Shannon Stokley	Associate Director for Science, Immunization Services Division (HHS/CDC)
Jordan Tappero	Director, Division of Global Health Protection (HHS/CDC)
Rob Tauxe	Director, Division of Foodborne, Waterborne and Environmental Diseases (HHS/CDC)
Jason Thomas	CDC Biosurveillance Coordinator, Center for Surveillance, Epidemiology, and Laboratory Services (HHS/CDC)
Cody Thornton	International Health Regulations Program Manager, International Health Regulations Branch (HHS/ASPR)
Jim Tyson	Chief, Situational Awareness Branch (HHS/CDC)
Paige Waterman	Deputy Director, Global Emerging Infections Surveillance (DOD/AFHSB)
Amy Watson	Program Coordinator, Laboratory Response Network-Chemical Section (HHS/CDC)
Susan Weekly	Biosafety and Biosecurity Advisor, Assistant Secretary for Chemical and Biological Defense (DOD/OBD)
Melinda Wharton	Director, Immunization Services Division (HHS/CDC)
Jean Whichard	Acting Associate Director for Antibiotic Resistance, Division of Foodborne, Waterborne, and Environmental Diseases (HHS/CDC)
Robert Whitcomb	Chief, Radiation Studies Branch (HHS/CDC)
Ian Williams	Chief, Outbreak Response and Prevention Branch (HHS/CDC)
Carrie Wolinetz	Associate Director for Science Policy, Office of Science Policy (HHS/NIH)
Chad Wood	Senior Counterterrorism Advisor (DHS)
David Yue	Acting Chief Medical Officer, National Disaster Medical System (HHS/ASPR)