



Assistant Secretary for Preparedness and Response

**PUBLIC HEALTH &
MEDICAL SITUATIONAL
AWARENESS STRATEGY**

2014



U.S. Department of Health and Human Services

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Introduction

The Pandemic and All-Hazards Preparedness Reauthorization Act (PAHPRA)¹ enacted on March 13, 2013, calls for the establishment of a near real-time, electronic nationwide public health situational awareness (SA) capability through an interoperable network of systems to share information. PAHPRA also calls for the Secretary of the Department of Health and Human Services (HHS) to submit to Congress a coordinated strategy and accompanying implementation plan identifying the steps for establishing this capability; modernizing and enhancing biosurveillance activities; and improving information sharing, coordination, and communication among systems. This Public Health and Medical Situational Awareness (PH&M SA) Strategy (Strategy) identifies HHS's primary goal for PH&M SA, provides definitions, utilizes guiding principles, and identifies the objectives and strategies that will guide HHS efforts to facilitate the enhancement of national PH&M SA capabilities. This Strategy establishes the foundational concepts from which the national implementation plan will be developed. This Strategy and the subsequent implementation plan will integrate with the forthcoming 2014 National Health Security Strategy (NHSS) through the end of 2018.

PAHPRA also called for HHS to consult with the National Biodefense Science Board (renamed April 30, 2014, to the National Preparedness and Response Science Board (NPRSB)), a federal advisory committee, in developing this Strategy. The NPRSB issued recommendations on PH&M SA and biosurveillance in letter reports in April² and October³ 2013. These recommendations were considered in developing this Strategy and are summarized in Appendix A.

HHS Authorities & Requirements

PAHPRA is the most recent legislation authorizing HHS to undertake PH&M SA and biosurveillance activities, and augments numerous other legislative and executive authorities and requirements directed at HHS. Specifically, the language in PAHPRA regarding establishment of a near real-time, electronic nationwide public health SA capability is consistent with language in Presidential Policy Directive 8⁴ and in the National Preparedness Goal⁵ directing a

¹ This PH&M SA Strategy addresses requirements as detailed in section 319D of the Public Health Service Act, as amended (42 U.S.C. § 247d-4).

² *An Evaluation of Our Nation's Public Health and Healthcare Situational Awareness: A Brief Report of the NBSB*. Available at <http://www.phe.gov/Preparedness/legal/boards/nbsb/Documents/sa-evaluation.pdf> Accessed on February 3, 2014.

³ *Modernizing and Enhancing Our Nation's Biosurveillance Capabilities Report from the National Biodefense Science Board*. Available at <http://www.phe.gov/preparedness/legal/boards/nbsb/meetings/documents/final-nbsb-sa-wg-bsv.pdf> Accessed on February 3, 2014.

⁴ *Presidential Policy Directive (PPD) 8: National Preparedness*. Available at <http://www.dhs.gov/xlibrary/assets/presidential-policy-directive-8-national-preparedness.pdf> Accessed on February 3, 2014.

⁵ *National Preparedness Goal*. Available at <http://www.fema.gov/pdf/prepared/npg.pdf> Accessed on February 3, 2014.

capabilities-based approach to achieving national security, to include national health security.⁶ Together, the scope and focus of these authorities and requirements address the detection of intentional dispersal of a biological agent, surveillance for foodborne illness, all-source biosurveillance and interoperable, near real-time networks, among other PH&M SA topics. Appendix B lists these laws and executive directives and shows where there is congruence and divergence in focus and scope among them. This Strategy responds to the PAHPRA requirement and provides a unified approach to SA in concert with the requirements of other pertinent laws and executive authorities.

Goal

To enhance the Nation's health security and protect the health, safety, and well-being of the American people by enhancing the Nation's operational PH&M SA capability to support decision making at all government levels and across critical infrastructure sectors before, during, and after an incident.

The Importance of Public Health and Medical Situational Awareness

PH&M SA contributes to health, homeland, and national security along with the national SA enterprise. PH&M SA is a critical national capability component because any incident has the potential to threaten the nation's health. The SA enterprise involves an active, continual, and timely information gathering loop that relies on existing assets, networks, and systems to inform risk analysis, decision making, forecasting, and response at all levels of the government and across all sectors of the community. Active and timely SA provides the foundation for responsible decisions and actions that, in turn, may result in better resource utilization, successful mitigation of emerging threats, and improved health outcomes for the population. PH&M SA captures information before, during, and after an incident related to health threats and health system and response resources thereby informing and improving prevention, protection, mitigation, response, recovery efforts, and ultimately, health outcomes. Effective PH&M SA requires the ability to tap into information from relevant sources, both domestic and international; the efficient use of appropriate information technologies for sharing information; effective coordination of information dissemination across federal, state, and local governments, as well as with international organizations, other countries, non-governmental organizations (NGOs), academia, and health system⁷ and other private sector entities; and the active use of information to make timely, well-informed decisions. The information required for PH&M SA

⁶ National health security is a state in which the Nation and its people are prepared for, protected from, and resilient in the face of health threats or incidents with potentially negative health consequences. *National Health Security Strategy of the United States of America*, December 2009, Department of Health and Human Services.

⁷ The health system includes all parts of the health care delivery system (e.g., primary and hospital care, disaster medicine, and behavioral health care) and the public health system. *National Health Security Strategy of the United States of America*, December 2009, Department of Health and Human Services (HHS).

is both situational and user dependent and may be specific to the pre-incident, response, and recovery phases of an incident, or specific to the decision maker or decision being made.

Definitions

To clarify the intent and scope of this Strategy, HHS uses the definitions below for biosurveillance and PH&M SA.

Biosurveillance: The process of gathering, integrating, interpreting, and communicating essential information related to all-hazards threats or disease activity affecting human, animal, or plant health to achieve early detection and warning, contribute to overall SA of the health aspects of an incident, and to enable better decision making at all levels.⁸

Public Health and Medical Situational Awareness: A knowledge state that results from the process of active information gathering (both domestic and international) with appropriate analysis, integration, interpretation, validation, and sharing of information related to health threats and the health of the human population, as well as health system and human services resources, health-related response assets, and other information that could impact the public's health to inform decision making, resource allocation, and other actions.

By these definitions, PH&M SA and biosurveillance are integrally related, though not synonymous. Biosurveillance is a key information gathering activity that encompasses human disease surveillance, animal disease surveillance, environmental monitoring, and gathering of intelligence and other information for early warning and situational awareness. PH&M SA primarily overlaps with biosurveillance for human health; however, the broader set of biosurveillance information gathering activities include non-health information that could secondarily impact health; thereby contributing to PH&M SA. PH&M SA also integrates information related to healthcare system capacity (e.g., available beds or ventilators) and available response assets (e.g., National Disaster Medical System or Strategic National Stockpile countermeasures). There is some overlap between biosurveillance and PH&M SA, and ultimately both contribute to overall SA related to health. Both biosurveillance and PH&M SA activities are critical before an incident to provide indicators and early warning of a routine or unusual incident that may require action, and during response and recovery operations by providing ongoing monitoring and characterization of the incident and forecasting the impacts of the incident to inform decision making.

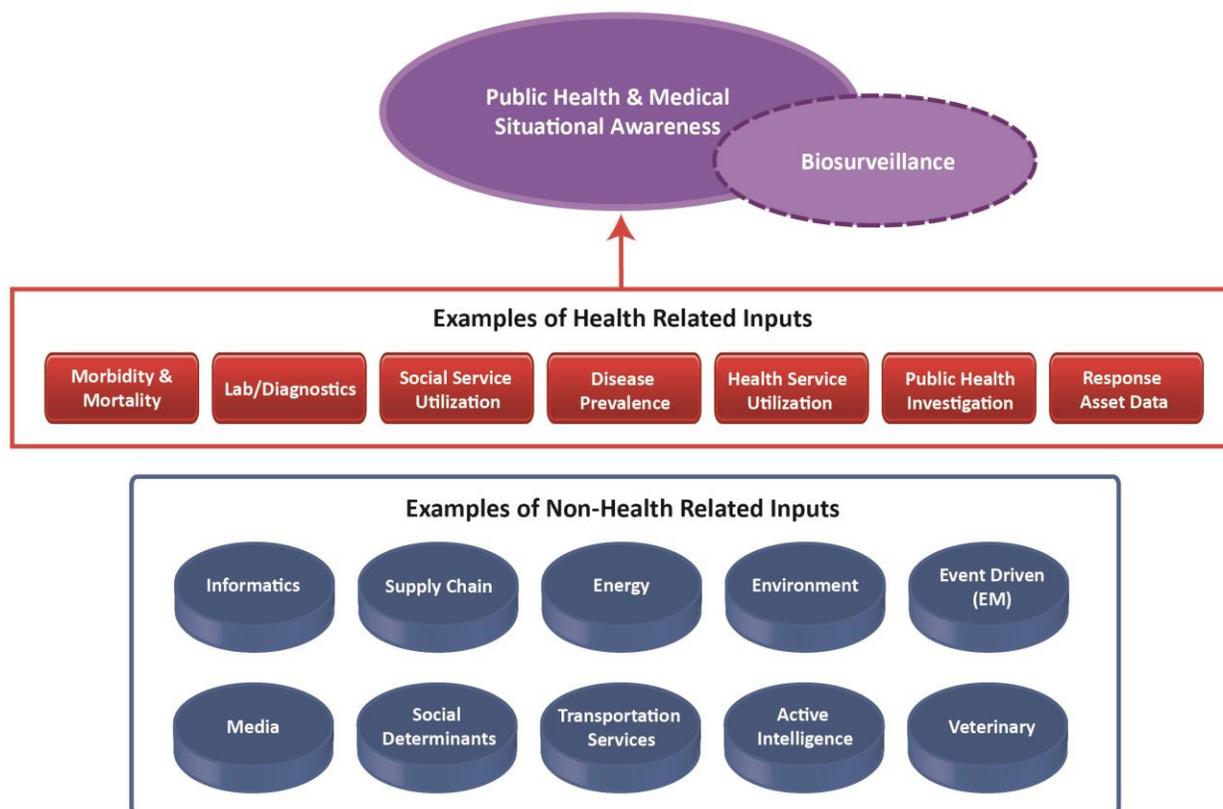
⁸ This definition is taken from the *National Strategy for Biosurveillance*, White House, July 2012. It is modified from the definition found in the *Homeland Security Presidential Directive-21, Public Health and Medical Preparedness*, White House, October 2007. PAHPRA defines the term biosurveillance as “the process of gathering near real-time biological data that relates to human and zoonotic disease activity and threats to human or animal health, in order to achieve early warning and identification of such health threats, early detection and prompt ongoing tracking of health events, and overall situational awareness of disease activity.” 42 U.S.C. § 247d-4(g). The definition of biosurveillance for the purposes of this Strategy is consistent with the PAHPRA definition.

Enhancing Public Health and Medical Situational Awareness

Biosurveillance and PH&M SA require the involvement of multiple federal departments and agencies in close coordination with state, local, tribal, and territorial (SLTT) governments; NGOs; the private sector; foreign governments; and international organizations before, during, and after an incident. Biosurveillance information sources inform overall PH&M SA and each contributes to the development and use of information and knowledge to inform decision making. Therefore, sourcing this information from multiple sectors and improving the timeliness, quality, and relevance of health-related information is critical to PH&M SA. Health-related information could be collected faster and with improved quality; information from non-human health sectors such as energy (e.g., power outages impacting healthcare facilities and persons dependent on medical equipment), transportation (e.g., medical supply chain logistics), commerce (e.g., border screening or school closures and other community mitigation measures), and foreign affairs (e.g., contacts with international organizations, diplomats, and key partner country health officials) could be better utilized for PH&M SA purposes.

Figure 1 provides examples of information sources, which HHS could leverage to potentially improve availability, relevance, quality, and timeliness to enrich PH&M SA. These examples are not intended as an all-inclusive list, but represent a sample of potential information sources.

Figure 1: Public Health and Medical Situational Awareness Information Sources



Guiding Principles

This Strategy utilizes the following guiding principles to enhance the national PH&M SA capability. These principles inform each of the Strategy’s objectives and will help shape the actions in the forthcoming implementation plan.

- Leverage and improve existing PH&M SA networks and information gathering systems, as appropriate;
- Ensure functional compatibility and interoperability are integrated into routine daily health activities;
- Require that timely, relevant, and accurate information is provided where decision making and actions occur, at all levels and across all sectors;
- Ensure defined conditions under which information is used, shared, or re-released that are consistent with all applicable laws and regulations;
- Ensure patient privacy is protected in accordance with applicable laws and regulations;
- Encourage multi-directional information sharing among stakeholders;
- Ensure a local to global perspective;
- Emphasize the importance of innovation, science, and state of the art technology; and,

- Ensure the application of ethical principles and standards for PH&M SA information sharing.

Objectives and Strategies for Enhancing Public Health and Medical Situational Awareness

The objectives and strategies identified below focus on activities that federal departments and agencies, SLTT governments, NGOs, health systems, and other private sector entities can carry out to contribute to enhancing the nation’s PH&M SA capability. Each objective below is defined and followed by specific strategies that will contribute to reaching the objective. The forthcoming implementation plan will identify specific actions for each of the strategies.

Objective 1: Foster Development of a Collaborative Oversight Authority and Management Structure to Build Capacity and Operationalize a National PH&M SA Capability

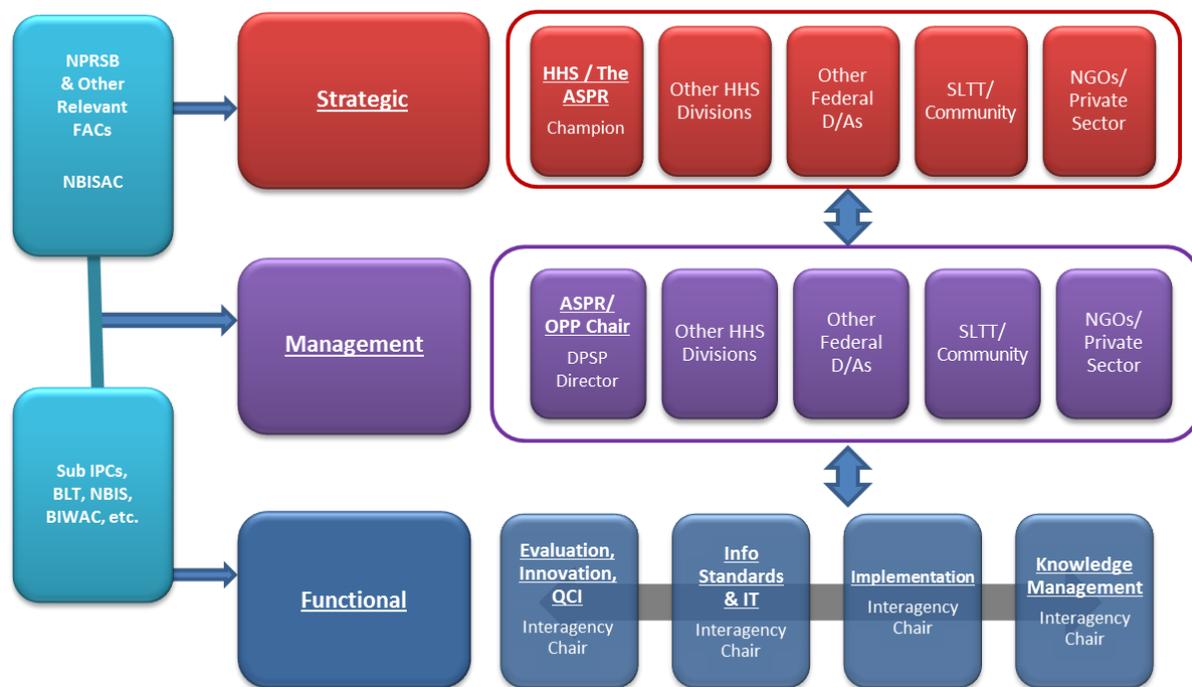
Of the recommendations put forth by the NPRSB, the greatest emphasis was placed on “...the need for the HHS Secretary to convene an HHS-led centralized public health and healthcare SA oversight authority with invited Federal partners to act as the central focal point to assure the compatibility, consistency, continuity, coordination, and integration of all disparate systems, and information requirements...”

This objective outlines the structure under which all participants—federal departments and agencies, SLTT governments, NGOs, health system entities and other private sector entities both domestically and internationally—can contribute to SA through a voluntary, collaborative effort. These partners represent contributors as well as users of PH&M SA information and should focus on the common goal of providing decision makers at all levels with the information they need. The following strategies will contribute to reaching objective 1:

- Strategy 1.1: Create a Collaborative Oversight Authority and Management Structure for Promoting an Expanded PH&M SA Capability: HHS will lead the creation of a PH&M SA collaborative oversight authority that will leverage existing entities (e.g., advisory committees, federal interagency policy committees) and processes (e.g., World Health Organization (WHO) International Health Regulations 2005 (IHR-2005)⁹, state public health reporting mechanisms, hospital bed reporting processes); utilize existing datasets (e.g., Active Pharmaceutical Ingredients) from various organizations; encourage cooperating entities to allow access to and analysis of surveillance data; and draw upon successes and lessons learned. This authority will foster an environment that encourages information exchange, innovation, trust, and continuous improvement. Figure 2 depicts a possible management structure for the PH&M SA capability.

Figure 2: Example of a Management Structure of the Public Health and Medical Situational Awareness Capability

⁹ WHO International Health Regulations 2005. Available at http://whqlibdoc.who.int/publications/2008/9789241580410_eng.pdf?ua=1 Accessed February 3, 2014.



Key to Acronyms:

- BLT – Biosurveillance Leadership Team
- BIWAC – Biological Indication and Warning Analytic Community
- DPSP – Division of Policy and Strategic Planning
- FAC – Federal Advisory Committee
- IPC – Interagency Policy Committee
- NBIS – National Biosurveillance Integration System
- NBISAC -- NBIS Advisory Committee
- NPRSB – National Preparedness and Response Science Board
- OPP – Office of Policy and Planning
- QCI – Quality and Continuous Improvement

- Strategy 1.2: Through this Authority, Work with Existing Bodies to Develop Collaborative Oversight Practices for PH&M SA: HHS will work with relevant federal departments and agencies including federal advisory committees, workgroups, associations, professional societies, and other governmental bodies such as the National Biosurveillance Integration System (NBIS) and NGO partners and stakeholders to identify and adopt best practices related to voluntary and collaborative oversight and coordination to ensure continual improvement and stewardship of the PH&M SA capability. This authority will be modeled on the success of the Public Health Emergency Medical Countermeasures Enterprise¹⁰ and the Senior Leaders Council on Patient Movement¹¹.

¹⁰ Available at <http://www.phe.gov/preparedness/mcm/phemce/Pages/default.aspx>. Accessed on March 20, 2014

¹¹ Available at <http://www.hhs.gov/asl/testify/2010/07/t20100722a.html>. Accessed on March 21, 2014

Objective 2: Ensure Timely, Relevant, and Accurate Information is Available to Inform Decisions at All Levels and Across All Sectors

Although each incident is unique, there are common information needs—including health information—in any national disaster or emergency. A robust PH&M SA capability also anticipates information requirements specific to the incident, is flexible enough to identify the unique decisions that need to be made, and produces appropriate information in a timely manner. Much of this work can be done proactively (prior to an incident) ensuring that the information and systems that support decision making; the information providers and users; and the processes are all in place. The following strategies will contribute to reaching objective 2:

- **Strategy 2.1: Identify Critical Decisions and Essential Information Needed for Decision Making:** There are common elements to every national health emergency that impact PH&M SA decision making. These elements include, but are not limited to:
 - The nature of the incident (intentional, accidental, or natural);
 - Identification of the causative agent;
 - The severity of the incident;
 - The population(s) impacted and those most vulnerable;
 - The geographic scope of the incident;
 - Contributing environmental or societal factors; and,
 - Effectiveness of mitigation strategies.

Each of these common elements requires information from a variety of sources. HHS is the lead federal agency and coordinator for the National Response Framework (NRF) Emergency Support Function #8 (ESF #8)¹² -- Public Health and Medical Services (see Appendix C); and the lead coordination agency for the National Disaster Recovery Framework¹³ (NDRF) Recovery Support Function (RSF) -- Health and Social Services (HSS) (see Appendix D). As such, HHS is the primary federal agency responsible for providing the necessary PH&M SA information to decision makers regarding ESF #8 and RSF-HSS functions. Knowing the common ESF #8 and RSF-HSS decisions that will need to be informed by PH&M SA in advance of an incident allows HHS and other partners to proactively plan for the collection of the available, relevant information before it is needed. Situations also arise where unique information may be required under specific circumstances. It is important to anticipate the need for this information, identify potential sources, and develop the plans and processes for collecting the information well in advance of the actual incident. HHS, through the collaborative oversight authority, will establish PH&M SA collection priorities, identify the information providers, and establish processes for collecting, analyzing, interpreting, and contextualizing PH&M SA information and relevant non-health information (e.g., energy, transportation).

¹² *Emergency Support Function #8 – Public Health and Medical Services Annex*. Available at <http://www.fema.gov/pdf/emergency/nrf/nrf-esf-08.pdf> Accessed February 3, 2014.

¹³ *National Disaster Recovery Framework. Strengthening Disaster Recovery for the Nation*. Available at <http://www.fema.gov/pdf/recoveryframework/ndrf.pdf> Accessed February 3, 2014.

coordination and management of events that may constitute a public health emergency of international concern, and will improve the capacity of all signatory countries to detect, assess, notify, and respond to public health threats. This, along with The Global Health Security Initiative¹⁴, the Global Health Strategy¹⁵, and the North American Plan for Animal and Pandemic Influenza¹⁶, are examples of partnerships that contribute to PH&M SA and global health security by providing support to emergency communications and information sharing. During a global health security crisis, these partnerships can bring together senior health officials and technical experts from the United States, Canada, and the other G-7 countries as well as Mexico, the European Commission, and the WHO to collaborate, share information and expertise, and reach universally acceptable decisions.

Objective 3: Evaluate Existing Network Capacity Ensuring it is Leveraged Where Appropriate and that New Capacity is Promoted Where Needed

There are a multitude of existing networks—functional (e.g., public health laboratory reporting), human (e.g., clinical and subject matter experts), and technological (e.g., health information technology (IT)—that could have potential to contribute to the PH&M SA capability. During a specific event some of these networks provide more value for PH&M SA than others. Within the current budget climate, PH&M SA networks should be leveraged and, where appropriate, enhanced to ensure maximum efficiency and interoperability within the PH&M SA capability. Whenever possible, innovation should be encouraged to promote new capacity where needed. The strengths and weaknesses of each network that contributes to PH&M SA need to be understood to determine which of these networks should be leveraged and identify gaps where new capacity is needed. The following strategies will contribute to reaching objective 3:

- **Strategy 3.1: Enhance Existing Functional Networks in Support of PH&M SA:** PH&M SA information collection and exchange occurs through multiple channels and may include a variety of information requirements (e.g., laboratory diagnostic test results, hospital and emergency department admissions, status of community health centers, and community access hospitals) and information sources (pharmacy, intelligence, epidemiological investigation). Understanding the existing networks and the contributions each can make to PH&M SA will allow us to better leverage existing capacity, set information collection priorities, and improve resource allocation. Where interoperability between existing networks is not practical or possible, an integration function must be performed to ensure that all relevant information from these disparate networks is considered.
- **Strategy 3.2: Leverage Existing and Promote New Human Clinical and Subject Matter Expertise Networks:** The “astute clinician” may provide the first indication of an unusual incident with adverse health effects. Networks of clinicians and other subject matter experts (public health epidemiologists, statisticians, data scientists, practitioners of medical informatics, etc.) can provide essential information to decision makers during an incident.

¹⁴ Available at <http://www.phe.gov/preparedness/international/ghsi/pages/default.aspx>. Accessed on March 21, 2014

¹⁵ Available at <http://www.globalhealth.gov/pdfs/Global%20Health%20Strategy.pdf>. Accessed on March 21, 2014

¹⁶ Available at <http://www.phe.gov/Preparedness/international/Documents/napapi.pdf>. Accessed on March 21, 2014

For example, The Department of Homeland Security's (DHS) National Biosurveillance Integration Center (NBIC) relies on a coalition of federal, state, and local government entities and private sector stakeholders to contribute to the federal government's capability to integrate and share key biosurveillance information to support decision makers. In addition, the WHO maintains the Global Outbreak Alert and Response Network,¹⁷ which provides a network of technical experts to identify, confirm, and respond to disease outbreaks of international importance. Similar clinical and subject matter expert networks can provide expertise regarding specific hazards or threats (e.g., exposure to petroleum or radiation as occurred with the Deepwater Horizon oil spill and Fukushima Dai-ichi Nuclear Power Plant Incident, respectively, or the emergence of a new virus such as Middle East Respiratory Syndrome Coronavirus). While health IT can provide an infrastructure for data collection and information sharing for the PH&M SA network, robust domestic and global clinical networks are necessary to organize and mobilize the human components of the PH&M SA network. These clinical networks also serve as an essential component of the analysis and decision making process and are an important resource to inform essential clinical research that contributes to PH&M SA during an incident response and recovery operation.

- Strategy 3.3: Leverage Health Information Technology Networks and Health Information Exchange in Support of PH&M SA: The technologies collectively known as health IT enable the secure collection and exchange of vast amounts of health data about individuals and populations. A robust health IT infrastructure encompasses the hardware, software, and nationally recognized standards to support electronic health information exchange (HIE) among organizations—such as a physician practice and a hospital, laboratory, or health department. Where appropriate, this infrastructure should have standards that support interoperability and information exchange. The centerpiece of the federal government's health IT strategy, the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs¹⁸, promotes the adoption and “Meaningful Use¹⁹” of EHRs in health information exchange, some of which can support PH&M SA. Federal, state, and whole community capacity building for health information exchange can support PH&M SA by leveraging the systems being developed and information being collected (e.g., syndromic surveillance systems) to meet other state and community day-to-day routine priorities, and ensure that patient privacy is protected in accordance with applicable laws and regulations.

Objective 4: Support Implementation of Presidential Policy Directive 21, Critical Infrastructure Security and Resilience

Presidential Policy Directive 21 (PPD-21) aims to strengthen the security and resilience of the Nation's critical infrastructure against both physical and cyber threats by requiring the federal government to work with critical infrastructure owners and operators and SLTT entities to take

¹⁷ Available at <http://www.who.int/csr/outbreaknetwork/en/>. Accessed on March 21, 2014.

¹⁸ Centers for Medicare and Medicaid Services EHR Incentive Programs accessed at <http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/index.html>

¹⁹ Meaningful use is using certified EHR technology to improve quality, safety, efficiency, and reduce health disparities; engage patients and family; improve care coordination, and population and public health; and maintain privacy and security of patient health information.

proactive steps to manage risk. This national effort must include expertise and day-to-day engagement from the Sector-Specific Agencies (SSAs); specialized or support capabilities from other federal departments and agencies; and strong collaboration with critical infrastructure owners and operators and SLTT entities. PPD-21 identifies 16 critical infrastructure sectors²⁰ and designates associated federal SSAs. HHS is the designated federal SSA for the Health and Public Health Critical Infrastructure Sector. The following strategy will contribute to reaching objective 4:

- Strategy 4.1: Coordinate the PH&M SA Capability and PPD-21 Efforts with the Health and Public Health Critical Infrastructure Sector: Where appropriate, the PH&M SA capability should support PPD-21 to reduce vulnerabilities, identify and disrupt threats, minimize consequences, and hasten response and recovery efforts related to critical infrastructure. Proactive and coordinated efforts are necessary to strengthen and maintain secure, functioning, and resilient critical infrastructure—including PH&M SA assets, networks, and systems. Relevant PH&M SA infrastructure may include distributed networks that utilize multiple data systems in concert with each other; varied organizational structures and operating models (including private sector and/or multi-national ownership); interdependent functions and systems in both the physical space and cyberspace; and governance constructs that involve multi-level authorities, responsibilities, and regulations. Critical infrastructure owners and operators are uniquely positioned to manage risks to their individual operations and assets, and to determine effective actions to make them more secure and resilient. HHS as the federal SSA is well positioned to coordinate both efforts with the Health and Public Health Critical Infrastructure Sector.

Objective 5: Ensure Continual Improvement and Innovation of Critical PH&M SA Functions

Information collection and sharing; knowledge management; and modeling and forecasting are critical PH&M SA functions. Many processes and methods are currently in place for collecting, sharing, integrating, and analyzing information, and modeling and forecasting to inform decision making. In many instances these processes and methods function adequately. However, where necessary, expansion, enhancement, continual improvement, and innovation should be encouraged. PH&M SA must be a dynamic capability in which process improvement and technological advancements are adopted; efficiencies are identified and promoted; and redundancies and duplication are reduced to ensure a state of the art PH&M SA capability. The implementation plan will reflect work that is underway to better define the requirements for these systems and undertake process improvements where needed. The following strategies will contribute to reaching objective 5:

- Strategy 5.1: Improve Data Collection and Information Sharing: Data collection occurs at many levels (e.g., federal, SLTT, healthcare organizations) and across sectors (e.g., public health, healthcare, law enforcement). A better understanding of which data are useful (not all data are) for the PH&M SA capability and improved methodologies, processes, technologies, and data use agreements can enhance the timeliness and accuracy of PH&M SA data. In

²⁰ Available at <http://www.dhs.gov/critical-infrastructure-sectors>. Accessed on March 21, 2014

addition, better interoperability and integration of data across disparate systems, and minimization of redundancies in data collection will improve efficiencies. Authorities for disclosure of personally identifiable information (PII) must be clear and the scope of its use must be documented in Privacy Act system of records notices, data use agreements, and other applicable agreements or contracts.

- Strategy 5.2: Enhance Knowledge Management Capabilities: Through data integration and analysis, knowledge management capabilities and processes enable the transformation of raw data into information and, subsequently, into actionable knowledge to produce decision support products. Improved data integration, analysis, and knowledge management tools can produce better PH&M SA decision support products for prompt and effective dissemination.
- Strategy 5.3: Refine Modeling and Forecasting Tools: The process of informing decision making requires an accurate description of the situation with comprehensive understanding of the likelihood of possible outcomes. The capability of the U.S. Government to forecast depends on three interrelated efforts: indicators that correlate with the course and impact of an incident; models that predict the course of an incident; and expertise of a professional workforce to translate the available information into a useful forecast. Continual improvement of modeling and simulation capabilities can provide enhanced PH&M SA decision support.
- Strategy 5.4: Promote the Adoption of Appropriate Technologies and Best Practices: The adoption of new technologies and best practices is an iterative process that will enhance PH&M SA capacity both domestically and internationally. Understanding the various technologies and networks that are currently in use and how they are being applied can lead to new opportunities to collaborate, innovate, and apply technology to expand and improve capabilities.

Conclusion

Lessons learned from recent incidents such as the 2009 H1N1 pandemic and Hurricane Sandy have reinforced the requirement for a robust PH&M SA capability that includes more than just public health and medical information, and integrates all relevant information in a timely manner to support decision making. This Strategy meets a PAHPRA requirement and outlines an approach that will serve as the basis for continued coordination to enhance the Nation's PH&M SA capability. The Strategy provides a common definition for PH&M SA and details objectives and strategies for the development of a national, coordinated PH&M SA capability that integrates among all levels of government and across all sectors of the community. As required by PAHPRA, HHS will establish a process to coordinate with federal health agencies as well as with other federal interagency and non-federal partners to develop a PH&M SA implementation plan. The implementation plan will contain concrete actions that federal and non-federal partners could implement to operationalize the Strategy. HHS will initiate and lead a process to develop the implementation plan once the Strategy is submitted to Congress. The Strategy and

implementation plan (SIP) will support other relevant National strategies, including the forthcoming NHSS 2015-2018.

APPENDIX A: Summary of National Preparedness and Response Science Board Recommendations

Task 1: Offer guidance and recommendations on the measurable steps to take to enhance the Nation's current public health and healthcare situational awareness capabilities.

Six Overarching Concepts for the SA SIP

1. Assurance of a common and unified strategy among all stakeholders involved in public health and healthcare SA efforts, with the scopes of both public health and healthcare SA to be explicitly defined;
2. Identification of the specific questions to be answered in support of both public health and healthcare SA;
3. Recognition that the system for data coordination must integrate the expertise and experience from across all levels and sectors;
4. Bidirectional communication of government agencies with all stakeholders, public and private;
5. Caution in developing common technological systems for SA and biosurveillance such that the valuable complexities of some existing systems are not reduced or lost; and,
6. Establishment of functional standards for data reporting to promote a common understanding of the target systems and capabilities.

Overall Recommendation

That the Secretary of HHS designate a central SA authority for coordinating all public health and healthcare SA data that have already been collected, processed, and analyzed from respective agencies on a national level.

Specific Recommendations:

1. Consulting with existing internal and external expert resources;
2. Continuing current system interoperability and integration efforts;
3. Determining and clarifying what and how data regarding zoonotic, agricultural, and other potentially public health impacting events should be communicated and integrated into the SA system;
4. Remembering and evaluating the lessons from previous events and emergencies to inform priorities and decision-making;
5. Ensuring and/or facilitating adequate funding, resources, and staffing for systems sustainability; and,
6. Integrating public health as the ESF #8 into the intelligence community for data sharing and monitoring.

Task 2: Identify the steps necessary to achieve a national biosurveillance system for human health with international connectivity; identify any duplicate surveillance programs under HHS, or changes necessary to existing programs to enhance and modernize activities, minimize duplication, strengthen and streamline activities, and achieve real-time data for both human and zoonotic disease activity; and, to coordinate with applicable existing Centers for Disease Control & Prevention (CDC) advisory committees.

Overall Recommendations

1. Re-emphasizes the need for the HHS Secretary to convene a HHS-led centralized public health and healthcare SA oversight authority with invited Federal partners to act as the central focal point to assure the compatibility, consistency, continuity, coordination, and integration of all disparate systems, and information requirements, hereafter referred to as the Central Executive Strategic Group (CESG). A central task of the CESG is the development of a strategy to coordinate the effective integration of activities across the Federal agencies (and partners) currently engaged in public health and healthcare SA, including human health biosurveillance. The CESG's role is to coordinate and develop national-level strategies for implementing an integrated nationwide biosurveillance system that provides continual and accessible SA to decision makers at all levels.

The Strategy should include:

- a. A process for evaluating and selecting the optimal information collection and information reporting systems;
 - b. Periodic monitoring of information summaries provided by various agencies and sources; and,
 - c. Approaches to consolidate and reduce—if not eliminate—overlapping and redundant methods of information collection.
2. The establishment of a Strategic Integration Group (SIG) composed of management representatives, including lead biosurveillance subject matter experts, from the relevant agencies. The SIG is specifically tasked with assuring the implementation of the CESG's strategy.

Implementation Strategy should include:

- a. Integrated Advice: Involve the CDC National Public Health Surveillance and Biosurveillance Advisory Committee (NPHSBAC) with the CESG's Activities;
- b. Review and define the utility of non-traditional information sources to traditional ones; and,
- c. Standardization of Strategies: Address the same baseline needs for consistency and continuity.

APPENDIX B: HHS Authorities and Requirements

Table 1 below provides an illustrative list of key authorities and requirements taken into account in developing this Strategy.

Table 1: HHS Authorities and Key Requirements on Biosurveillance and PH&M SA Emphasis

Title of Authority/Requirements	Information Sharing	New / Emerging Technologies (EHR / KM)	CBRN SA	All Hazards Threat / Disease Activity	Expedite Government Decision	Food Illness Surveillance	Surveillance for Post-Marketing Product Safety	Epidemiologic Surveillance System	Global Health Security	Common Operating Picture	Private Sector Integration	Communication
The Pandemic and All-Hazards Preparedness Reauthorization Act (PAHPRA) of 2013	X	X	X	X	X		X	X	X	X	X	X
Implementation Plan for the National Strategy for Biosurveillance 2013 (The White House, 2013) [Not public]	X	X	X	X	X	X	X	X	X	X	X	X
National Strategy for Biosurveillance 2012	X	X	X	X	X	X		X	X		X	X
FDA Food Safety Modernization Act 2011	X	X	X		X	X	X	X	X		X	X
Homeland Security Presidential Directive (HSPD)-21: Public Health and Medical Preparedness 2007	X			X	X			X	X	X	X	X
Implementing the Recommendations of the 911 Commission Act 2007	X	X	X	X	X	X		X		X	X	
Pandemic and All-Hazards Preparedness Act (PAHPA) 2006	X	X	X	X	X		X	X	X	X	X	X
HSPD-10: Biodefense for the 21st Century 2004	X	X	X	X		X		X	X		X	X
HSPD-9: Defense of United States Agriculture and Food 2004	X		X	X		X	X	X	X	X	X	X
Public Health, Security and Bioterrorism Preparedness and Response Act 2002	X	X	X			X	X	X	X		X	X
Public Health Service Act 1944, as amended	X	X	X	X	X		X	X	X	X	X	X
Federal Food, Drug, and Cosmetic Act 1938, as amended (21 U.S.C.)	X	X	X		X	X	X	X	X		X	X
FDA Amendments Act		X				X	X	X	X		X	X
FDA Safety and Innovation Act		X			X		X	X	X	X	X	X
WHO International Health Regulations 2005	X		X	X	X	X	X	X	X	X	X	X
North American Plan for Animal and Pandemic Influenza 2012	X		X		X			X	X			X
Presidential Policy Directive (PPD) 8: National Preparedness	X		X	X				X	X	X	X	

APPENDIX C: Emergency Support Functions and ESF Coordinators

<p>ESF #1—Transportation ESF Coordinator: Department of Transportation</p>
<p>Key Response Core Capability: Critical Transportation</p>
<p>Coordinates the support of management of transportation systems and infrastructure, the regulation of transportation, management of the Nation’s airspace, and ensuring the safety and security of the national transportation system. Functions include but are not limited to:</p> <ul style="list-style-type: none"> ▪ Transportation modes management and control ▪ Transportation safety ▪ Stabilization and reestablishment of transportation infrastructure ▪ Movement restrictions ▪ Damage and impact assessment.
<p>ESF #2—Communications ESF Coordinator: DHS/National Communications System</p>
<p>Key Response Core Capability: Operational Communications</p>
<p>Coordinates the reestablishment of the critical communications infrastructure, facilitates the stabilization of systems and applications from cyber-attacks, and coordinates communications support to response efforts. Functions include but are not limited to:</p> <ul style="list-style-type: none"> ▪ Coordination with telecommunications and information technology industries ▪ Reestablishment and repair of telecommunications infrastructure ▪ Protection, reestablishment, and sustainment of national cyber and information technology resources ▪ Oversight of communications within the Federal response structures.
<p>ESF #3—Public Works and Engineering ESF Coordinator: DOD/U.S. Army Corps of Engineers</p>
<p>Key Response Core Capabilities: Infrastructure Systems, Critical Transportation, Public and Private Services and Resources, Environmental Response/Health and Safety, Fatality Management, Mass Care Services, Mass Search and Rescue Operations</p>
<p>Coordinates the capabilities and resources to facilitate the delivery of services, technical assistance, engineering expertise, construction management, and other support to prepare for, respond to, and/or recover from a disaster or an incident. Functions include but are not limited to:</p> <ul style="list-style-type: none"> ▪ Infrastructure protection and emergency repair ▪ Critical infrastructure reestablishment ▪ Engineering services and construction management ▪ Emergency contracting support for lifesaving and life-sustaining services.

ESF #4—Firefighting**ESF Coordinator: USDA/U.S. Forest Service and DHS/FEMA/U.S. Fire Administration**

Key Response Core Capabilities: Critical Transportation, Operational Communications, Public and Private Services and Resources, Infrastructure Systems, Mass Care Services, Mass Search and Rescue Operations, On-scene Security and Protection, Public Health and Medical Services

Coordinates the support for the detection and suppression of fires. Functions include but are not limited to:

- Support to wild land, rural, and urban firefighting operations.

ESF #5—Information and Planning**ESF Coordinator: DHS/FEMA**

Key Response Core Capabilities: Situational Assessment, Planning, Public Information and Warning

Supports and facilitates multiagency planning and coordination for operations involving incidents requiring Federal coordination. Functions include but are not limited to:

- Incident action planning
- Information collection, analysis, and dissemination.

ESF #6—Mass Care, Emergency Assistance, Temporary Housing, and Human Services**ESF Coordinator: DHS/FEMA**

Key Response Core Capabilities: Mass Care Services, Public and Private Services and Resources, Public Health and Medical Services, Critical Transportation, Fatality Management Services

Coordinates the delivery of mass care and emergency assistance, including:

- Mass care
- Emergency assistance
- Disaster housing
- Human services.

ESF #7—Logistics**ESF Coordinator: General Services Administration and DHS/FEMA**

Key Response Core Capabilities: Public and Private Services and Resources, Mass Care Services, Critical Transportation, Infrastructure Systems, Operational Communications

Coordinates comprehensive incident resource planning, management, and sustainment capability to meet the needs of disaster survivors and responders. Functions include but are not limited to:

- Comprehensive, national incident logistics planning, management, and sustainment capability
- Resource support (e.g., facility space, office equipment and supplies, contracting services).

ESF #8—Public Health and Medical Services

ESF Coordinator: Department of Health and Human Services

Key Response Core Capabilities: Public Health and Medical Services, Fatality Management Services, Mass Care Services, Critical Transportation, Public Information and Warning, Environmental Response/Health and Safety, Public and Private Services and Resources

Coordinates the mechanisms for assistance in response to an actual or potential public health and medical disaster or incident. Functions include but are not limited to:

- Public health
- Medical surge support including patient movement
- Behavioral health services
- Mass fatality management.

ESF #9—Search and Rescue

ESF Coordinator: DHS/FEMA

Key Response Core Capability: Mass Search and Rescue Operations

Coordinates the rapid deployment of search and rescue resources to provide specialized lifesaving assistance. Functions include but are not limited to:

- Structural Collapse (Urban) Search and Rescue
- Maritime/Coastal/Waterborne Search and Rescue
- Land Search and Rescue.

ESF #10—Oil and Hazardous Materials Response

ESF Coordinator: Environmental Protection Agency

Key Response Core Capabilities: Environmental Response/Health and Safety, Critical Transportation, Infrastructure Systems, Public Information and Warning

Coordinates support in response to an actual or potential discharge and/or release of oil or hazardous materials. Functions include but are not limited to:

- Environmental assessment of the nature and extent of oil and hazardous materials contamination
- Environmental decontamination and cleanup.

ESF #11—Agriculture and Natural Resources**ESF Coordinator: Department of Agriculture**

Key Response Core Capabilities: Environmental Response/Health and Safety, Mass Care Services, Public Health and Medical Services, Critical Transportation, Public and Private Services and Resources, Infrastructure Systems

Coordinates a variety of functions designed to protect the Nation’s food supply, respond to plant and animal pest and disease outbreaks, and protect natural and cultural resources.

Functions include but are not limited to:

- Nutrition assistance
- Animal and agricultural health issue response
- Technical expertise, coordination, and support of animal and agricultural emergency management
- Meat, poultry, and processed egg products safety and defense
- Natural and cultural resources and historic properties protection.

ESF #12—Energy**ESF Coordinator: Department of Energy**

Key Response Core Capabilities: Infrastructure Systems, Public and Private Services and Resources, Situational Assessment

Facilitates the reestablishment of damaged energy systems and components and provides technical expertise during an incident involving radiological/nuclear materials. Functions include but are not limited to:

- Energy infrastructure assessment, repair, and reestablishment
- Energy industry utilities coordination
- Energy forecast.

ESF #13—Public Safety and Security**ESF Coordinator: Department of Justice/Bureau of Alcohol, Tobacco, Firearms, and Explosives**

Key Response Core Capability: On-scene Security and Protection

Coordinates the integration of public safety and security capabilities and resources to support the full range of incident management activities. Functions include but are not limited to:

- Facility and resource security
- Security planning and technical resource assistance
- Public safety and security support
- Support to access, traffic, and crowd control.

ESF #14—Superseded by National Disaster Recovery Framework

ESF #15—External Affairs

ESF Coordinator: DHS

Key Response Core Capability: Public Information and Warning

Coordinates the release of accurate, coordinated, timely, and accessible public information to affected audiences, including the government, media, NGOs, and the private sector. Works closely with state and local officials to ensure outreach to the whole community. Functions include, but are not limited to:

- Public affairs and the Joint Information Center
- Intergovernmental (local, state, tribal, and territorial) affairs
- Congressional affairs
- Private sector outreach
- Community relations.

APPENDIX D: Recovery Support Functions and RSF Coordinators

<p>RSF: COMMUNITY PLANNING AND CAPACITY BUILDING</p> <p>Coordinating Agency: DHS/FEMA Primary Agencies: DHS/FEMA, HHS Supporting Organizations: CNCS, DHS, DOC, DOI, DOJ, DOT, ED, EPA, GSA, HUD, SBA, TREAS, USDA</p>
<p>Mission</p> <p>Supporting and building recovery capacities and community planning resources of local, State and Tribal governments needed to effectively plan for, manage and implement disaster recovery activities in large, unique or catastrophic incidents.</p>
<p>RSF: ECONOMIC</p> <p>Coordinating Agency: DOC Primary Agencies: DHS/FEMA, DOC, DOL, SBA, TREAS, USDA Supporting Organizations: CNCS, DOI, EPA, HHS</p>
<p>Mission</p> <p>The mission of the Economic RSF is to integrate the expertise of the Federal Government to help local, State, and Tribal governments and the private sector sustain and/or rebuild businesses and employment, and develop economic opportunities that result in sustainable and economically resilient communities after large-scale and catastrophic incidents.</p>
<p>RSF: HEALTH AND SOCIAL SERVICES</p> <p>Coordinating Agency: HHS Primary Agencies: CNCS, DHS (FEMA, NPPD & CRCL), DOI, DOJ, DOL, ED, EPA, VA Supporting Organizations: DOT, SBA, TREAS, USDA, VA, ARC, NVOAD</p>
<p>Mission</p> <p>The Health and Social Services RSF mission is for the Federal Government to assist locally-led recovery efforts in the restoration of the public health, health care, and social services networks to promote the resilience, health, and well-being of affected individuals and communities.</p>

RSF: HOUSING

Coordinating Agency: HUD

Primary Agencies: DHS/FEMA, DOJ, HUD, USDA

Supporting Organizations: CNCS, DOC, DOE, EPA, HHS, SBA, U.S. Access Board, VA, ARC, NVOAD

Mission

Address pre- and post-disaster housing issues and coordinate and facilitate the delivery of Federal resources and activities to assist local, State, and Tribal governments in the rehabilitation and reconstruction of destroyed and damaged housing, whenever feasible, and development of other new accessible, permanent housing options.

RSF: INFRASTRUCTURE SYSTEMS

Coordinating Agency: DOD/USACE

Primary Agencies: DHS (FEMA & NPPD), DOD/USACE, DOE, DOT

Supporting Organizations: DHS, DOC, DOD, DOI, ED, EPA, FCC, GSA, HHS, NRC, TREAS, USDA, TVA

Mission

Facilitate the integration of the capabilities of the Federal Government to support local, State, and Tribal governments and other infrastructure owners and operators in their efforts to achieve recovery goals relating to the public engineering of the Nation's infrastructure systems.

RSF: NATURAL AND CULTURAL RESOURCES

Coordinating Agency: DOI

Primary Agency: DHS/FEMA, DOI, EPA

Supporting Organizations: ACHP, CNCS, CEQ, DOC, IMLS, LOC, NEA, NEH, USACE, USDA, Heritage Preservation

Mission

Integrate Federal assets and capabilities to help State and Tribal governments and communities address long-term environmental and cultural resource recovery needs after large-scale and catastrophic incidents.

APPENDIX E: Acronyms List

ACHP	Advisory Council on Heritage Preservation
ARC	American Red Cross
ASPR	Office of the Assistant Secretary for Preparedness & Response
ATF	Bureau of Alcohol, Tobacco, Firearms, & Explosives
BIWAC	Biosurveillance Indications & Warning Analytic Community
CBRN	Chemical, Biological, Radiological, & Nuclear
CDC	Centers for Disease Control & Prevention
CEQ	Council on Environmental Equality
CESG	Central Executive Strategy Group
CNCS	Corporation for National & Community Service
CRCL	Civil Rights & Civil Liberties (DHS)
DHS	Department of Homeland Security
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOJ	Department of Justice
DOL	Department of Labor
DOT	Department of Transportation
ED	Department of Education
EHR	Electronic Health Record
EPA	Environmental Protection Agency
ESF	Emergency Support Function(s)
FCC	Federal Communications Commission
FDA	Food & Drug Administration
FEMA	Federal Emergency Management Agency (DHS)
GHS	Global Health Strategy
GHSI	Global Health Security Initiative
GOARN	Global Outbreak Alert & Response Network
GSA	General Services Administration
HHS	Department of Health & Human Services
HIE	Health Information Exchange
HSPD	Homeland Security Presidential Directive
HSS	Health & Social Services
HUD	Department of Housing and Urban Development
IHR	International Health Regulations
IMLS	Institute of Museum & Library Services
IT	Information Technology
LOC	Library of Congress
MERSC	Middle East Respiratory Syndrome Coronavirus
NAPAPI	North American Plan for Animal & Pandemic Influenza
NBIC	National Biosurveillance Integration Center
NBIS	National Biosurveillance Integration System
NBSB	National Biodefense Science Board

NDRF	National Disaster Recovery Framework
NEA	National Education Association
NEH	National Endowment for the Humanities
NGO(s)	Non-Governmental Organization(s)
NHSS	National Health Security Strategy
NPG	National Preparedness Goal
NPHSBAC	National Public Health Surveillance & Biosurveillance Advisory Committee
NPPD	National Protection & Programs Directorate (DHS)
NPRSB	National Preparedness and Response Science Board
NRC	Nuclear Regulatory Commission
NRF	National Response Framework
NVOAD	National Voluntary Organizations Active in Disaster
PAHPA	Pandemic & All-Hazards Preparedness Act
PAHPRA	Pandemic & All-Hazards Preparedness Reauthorization Act
PH&M SA	Public Health & Medical Situational Awareness
PHEMCE	Public Health Emergency Medical Countermeasures Enterprise
PPD	Presidential Policy Directive
PPI	Personally Identifiable Information
RSF(s)	Recovery Support Function(s)
SA	Situational Awareness
SBA	Small Business Administration
SIG	Strategic Integration Group
SIP	Strategy & Implementation Plan
SLTT	State, Local, Tribal, and Territorial
SSA(s)	Sector-Specific Agency(s)
TREAS	Department of the Treasury
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFA	United States Fire Administration
USFS	United States Forest Service
VA	Veterans Affairs
WHO	World Health Organization

APPENDIX F: Description of Potential Advisory Bodies

Biosurveillance Leadership Team (BLT): was initially convened in June 2010 to address critical, cross-CIO issues in biosurveillance. The BLT is an internal workgroup that has a presence at the intersects of biosurveillance efforts between and among CDC CIOs, as well as those with partners and stakeholders across the Federal Government. Members are experts within their organizations with the ability to represent effectively their respective organizations' interests, and as leaders with experience and specialized knowledge in the field of biosurveillance.

National Preparedness and Response Science Board (NPRSB) (Formerly the National Biodefense Science Board): was established under Section 402 of the Pandemic and All-Hazards Preparedness Act (P.L. 109-417) (codified at Section 319M of Title III of the Public Health Service Act (42 U.S.C. 247d-7f), as amended) and Section 222 of the Public Health Service Act (42 U.S.C. § 217a). The NPRSB is governed by the Federal Advisory Committee Act (5 U.S.C. App.), which sets forth standards for the formation and use of advisory committees. The NPRSB advises the Secretary of HHS and/or ASPR on current and future trends, challenges, and opportunities presented by advances in biological and life sciences, biotechnology, and genetic engineering with respect to threats posed by naturally occurring infectious diseases and chemical, biological, radiological, and nuclear agents.

National Biosurveillance Integration System (NBIS): NBIS is a national interagency biosurveillance integration body coordinated by the DHS National Biosurveillance Integration Center (NBIC) in accordance with a series of U.S. laws and directives (HSPD-9 and -10, Public Law 110-53 Section 1101, Food Safety Modernization Act Section 205). NBIS member agencies integrate data within their biosurveillance domain and share this information with NBIC after the data are analyzed by their subject matter experts. NBIC, in full collaboration with the NBIS, connects, correlates, and contextualizes information across domains through the production and dissemination of its analytic products. NBIC's integrating role enhances the Federal government's ability to provide early warning and contributes to situational awareness.

Biosurveillance Indications and Warning Analytic Community (BIWAC): The BIWAC is a self-organized, informal biosurveillance information sharing group with participants from multiple U.S. government organizations. The BIWAC shares biosurveillance data via web interfaces and has focused on interagency collaboration and relationship building.