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12 **BIENNIAL IMPLEMENTATION PLAN**

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16 **THE NATIONAL HEALTH SECURITY STRATEGY**
17 **OF THE UNITED STATES OF AMERICA**
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22 United States Department of Health and Human Services
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INTRODUCTION

The National Health Security Strategy (NHSS) provides the first comprehensive approach to galvanizing the Nation's many efforts to minimize the health consequences associated with large-scale incidents, including natural disasters, disease outbreaks, hazardous materials spills, nuclear accidents, and biological and other terrorist attacks. It provides a common strategy to help the Nation prevent, protect against, respond to, and recover from such incidents. The NHSS is designed to leverage and improve the unique strengths and capabilities of all levels of government, the private and non-profit sectors, communities, and individuals. An Interim Implementation Guide identified initial activities that provide the foundation for the more complete biennial implementation planning process described here.^{1,2}

This companion document, the first Biennial Implementation Plan (BIP) for the NHSS, provides an approach to implementing activities related to the NHSS. It describes a set of desired outcomes and specific activities that are designed to put the Nation on the path toward realizing the goals and objectives contained in the Strategy. The primary focus of the BIP is on key outcomes that should be realized over the next four years to meet the NHSS' objectives and specific activities that should be performed in the next two years.

While the role of government is critical to achieving the desired outcomes, the strong systems needed to achieve national health security are built on the efforts of all sectors of society, including private-sector, non-governmental, and academic organizations; individuals, families, and communities; as well as health care providers and emergency responders. Therefore, the activities in the BIP typically involve the efforts of multiple sectors working in collaboration.

A Vision of National Health Security

The NHSS defined national health security as follows:

National health security is achieved when the Nation and its people are prepared for, protected from, respond effectively to, and are able to recover from incidents with potentially negative health consequences.

The NHSS is designed to achieve two goals:

¹ U.S. Department of Health and Human Services, *National Health Security Strategy* (December 2009) (accessed online 6/30/10 at <http://www.hhs.gov/aspr/opsp/nhss/nhss0912.pdf>).

² U.S. Department of Health and Human Services, *Interim Implementation Guide for the National Health Security Strategy* (December 2009) (accessed online 6/30/10 at http://www.hhs.gov/aspr/opsp/nhss/nhss_iig0912.pdf).

- **Build community resilience.** Community resilience, as defined in the NHSS, is the sustained ability of communities to withstand and recover – in both the short and long terms – from adversity, such as an influenza pandemic or terrorist attack. Community resilience entails the ongoing and developing capacity of the community to account for its vulnerabilities and develop capabilities that aid that community in: 1) preventing, absorbing, and mitigating the stress of a health incident with limited expectation of external support; 2) recovering in a way that rapidly restores the community to a state of self-sufficiency and at least the same level of health and social functioning after adversity; and 3) using knowledge from a past response to strengthen the community’s ability to withstand the next health incident.
- **Strengthen and sustain health and emergency response systems.** Services provided by public health, health care delivery, and emergency response systems complement efforts to build community resilience. Strong public health, health care delivery, and emergency response systems can help minimize and/or prevent some incidents from occurring; facilitate the rapid detection and characterization of a health incident; provide care to those affected, including behavioral health care; reduce the effects of the incident on the community; and help a community recover after an incident. Such systems must themselves be resilient in that they should be durable, robust, responsive, adaptive to changing situations, efficient, and interoperable.

These goals are supported by ten strategic objectives, which address areas that require focused attention and improvement over the next four years. The strategic objectives describe what must be accomplished to address current gaps in national health security and to maintain improvements in health security over the longer term. The ten strategic objectives are:

- Foster informed, empowered individuals and communities
- Develop and maintain the workforce needed for national health security
- Ensure situational awareness
- Foster integrated, scalable health care delivery systems
- Ensure timely and effective communications
- Promote an effective countermeasures enterprise
- Ensure prevention or mitigation of environmental and other emerging threats to health
- Incorporate post-incident health recovery into planning and response
- Work with cross-border and global partners to enhance national, continental and global health security
- Ensure that all systems that support national health security are based upon the best available science, evaluation and quality improvement methods

This Biennial Implementation Plan provides a plan of action to help the Nation’s communities build and maintain the capabilities needed to achieve these ten objectives.

Key Themes and Assumptions Underlying the Biennial Implementation Plan

It is important that all stakeholders understand the context within which the BIP was developed and is being implemented, as well as some of the critical assumptions underlying this Plan.

Achieving national health security requires an “enterprise” approach. National health security requires the contributions of the full range of governmental and non-governmental organizations, communities, and individuals. Achieving national health security thus requires an enterprise approach, which involves a shared understanding of the issues to be addressed, coordinated efforts in addressing these issues, and the development and implementation of common solutions.³ Although federal agencies can often provide some resources and leadership and help establish partnerships among governmental and non-governmental entities, national health security is the responsibility of the entire Nation. As such, the BIP emphasizes how communities, educational institutions, employers, individuals, and other stakeholders can and should contribute resources and expertise to building national health security.

A high level of integration and coordination is essential to national health security. In light of the enterprise approach to achieving national health security, a high level of integration and coordination is needed within and across the wide range of organizations, institutions, and sectors within a community. Achieving national health security also requires coordination between the health care delivery, public health, and emergency response systems, all of which need to work together as part of one integrated national health security system. Interoperability, integration, and coordination are also needed to ensure that systems infrastructure and technologies, such as those used for communication and situational awareness, function effectively together.

It is also important to ensure that the activities in the BIP are integrated and coordinated with other health- and security-related initiatives so that resources are used in ways likely to have the greatest possible impact on the Nation’s health security. The broad sweep and complicated nature of health threats faced by the Nation suggests the need for interdisciplinary approaches such as those associated with a “One Health” framework, which involves collaboration among public health, nursing, emergency medical services, behavioral health, veterinary medicine, and other health-related disciplines.⁴

³ For example, the recently released Quadrennial Homeland Security Review (QHSR) refers to the “homeland security enterprise,” which involves enhancing shared awareness of risks and threats, building capable communities, fostering unity of effort, and fostering innovative approaches and solutions through leading-edge science and technology. See U.S. Department of Homeland Security, *Quadrennial Homeland Security Review Report: A Strategic Framework for a Secure Homeland*, Washington, D.C.: U.S. Department of Homeland Security, February 2010.

⁴ “One Health” refers to a worldwide movement and strategy to improve human and animal health through interdisciplinary collaborations that focus on identifying and implementing integrated solutions. (Accessed online 6/30/10 at <http://www.onehealthinitiative.com/index.php>).

Finally, while the activities described in this Plan are organized around specific strategic objectives, there needs to be integration of activities across objectives. In many instances, investments in a given activity will pay dividends across multiple objectives. In some cases, performance of an activity described under one objective will lay the necessary groundwork for the performance of another activity under a different objective.

National health security is built on a foundation of community resilience. Given that resources are limited during an incident, it is increasingly recognized that communities may need to be on their own for at least 48 hours before outside help arrives, and thus need to build resilience before an incident occurs. Key components or “building blocks” of community resilience include the physical and psychological health of the population; the social connectedness of community members; the level of social integration of government and non-governmental organizations (NGOs) in planning, response, and recovery; individual attitudes of self-reliance and self-help; effective risk communication; and social and economic well-being. Communities build resilience by implementing policies and practices that ensure the conditions under which people can be healthy, gaining knowledge of and addressing the needs of at-risk individuals, and creating a culture of preparedness in which a “bystander response” is not the exception but the norm. Resilient communities are prepared to prevent, absorb, and mitigate the initial stress of an incident with limited expectation of external support; undertake recovery activities that restore the community to pre-incident levels of health and social functioning; and use knowledge gained from one incident to strengthen the community’s ability to withstand the next incident. Community resilience is captured in multiple objectives within the BIP through such concepts as the intersection of individual and community preparedness, empowerment of at-risk individuals, participatory decision-making in planning, response, and recovery activities, and use of lessons learned to improve planning for the next incident.

The needs of at-risk individuals must be addressed. Many individuals may not be able to take care of all of their own needs and may require assistance before, during, or after an incident. An assumption underlying the BIP is that the needs of such at-risk individuals must be addressed as part of the process of building national health security; and these needs must also be addressed across the lifespan, from the unique needs of children in the development and distribution of medical countermeasures to ensuring the safety of senior citizens in a shelter-in-place scenario. The U.S. Department of Health and Human Services has developed the following definition of at-risk individuals: “Before, during, and after an incident, members of at-risk populations may have additional needs in one or more of the following functional areas: communication, medical care, maintaining independence, supervision, and transportation. In addition to those individuals specifically recognized as at-risk in the Pandemic and All-Hazards Preparedness Act (i.e., children, senior citizens, and pregnant women), individuals who may need additional response assistance include those who have disabilities, live in institutionalized settings, are from diverse

cultures, have limited English proficiency or are non-English speaking, are transportation disadvantaged, have chronic medical disorders, and have pharmacological dependency.”

Like most public endeavors, national health security must be achieved and supported in a resource-constrained environment. Given the current fiscal climate, the BIP is built on the assumption that there will be no significant sums of new public funds available for national health security in the next two years; thus, the activities in this plan are priorities to be executed within existing federal budget authority. Lead agencies responsible for performing specific activities will also seek opportunities to work in partnership with organizations and individuals outside the federal government using available funding mechanisms, such as grants, cooperative agreements, contracts, and co-sponsorships. Non-monetary investments – of time, effort, and expertise – are also key to supporting national health security. A large share of relevant resources that can support national health security, particularly human and organizational resources, lie outside of government in community organizations, private businesses, and individuals. However, the BIP is not an unfunded mandate. The challenge is to discover new and creative ways to harness existing resources so that they are used more efficiently and effectively and to identify innovative ways to stimulate non-governmental investments so that sufficient resources can be brought to bear in this critical national effort.

To make significant progress in the achieving the NHSS objectives, a number of important real or perceived legal considerations must be addressed. Legal preparedness is an essential component of national health security. Communities should have the legal authorities they need to prepare for, respond to, and recover from the full spectrum of health incidents.

While many such concerns are specific to particular objectives, a variety of legal challenges cut across multiple objectives. Such challenges include, but are not limited to:

- Workers compensation protections for health care workers
- Health information privacy issues
- Prescription authorities for non-physician health care providers
- The use of altered standards of care
- Waivers of informed consent
- Licensing and credentialing of volunteers and medical personnel working outside their states of residence
- Data ownership
- Liability protections
- Isolation and quarantine authorities

In some instances, addressing these legal concerns may require changes in law. However, in many instances these issues can be adequately addressed by incorporating legal counsel in national health security policymaking and planning efforts, through greater use of memoranda of understanding, and by providing enhanced legal preparedness training for health care providers and others with important roles in managing health incidents.

To provide an appropriate foundation for national health security, it will be important to assess the status of legal preparedness for health security at the community, regional, state, and national levels. Reviews of the adequacy of legal preparedness during recent health security incidents will provide a valuable basis for identifying gaps, ambiguities, and other shortcomings in current legal authorities; will assist in applying those laws in a coordinated manner across multiple sectors and jurisdictions, and will help identify relevant best practices. The findings and recommendations of the assessment of legal preparedness for health security should be widely disseminated to communities and individuals and should help inform the development of an action plan to improve legal preparedness.

The evidence base for health security is still in the early stages of development. Given the newness of health security as a national focus, efforts to develop the evidence base are still in their early stages, and the fortunate rarity of large-scale health emergencies results in few opportunities to observe the national health security system operating in challenging circumstances. As a result, the field has a limited science base on which to identify best practices and to develop performance measures and standards. Nonetheless, the development of the BIP was informed by the evidence that is available, and supplemented by input from subject matter experts and technical advisory committees.

Focus and Organization of the Plan

Implementation of the NHSS is a long-term proposition. The NHSS is ambitious in scope, and achieving the outcomes identified in the BIP is a formidable task. The hope is that the outcomes and activities identified in the BIP will put the Nation on the right path.

Given the decentralized nature of the health security system, implementation must often be preceded by a process of coming to a common understanding of a problem and securing commitments for specific action. Where possible, the BIP provides detailed actions, roles, and responsibilities. In many instances, however, it allows flexibility for ongoing adaptation.

The BIP incorporates a framework for continuous evaluation and learning. Given the nascent state of the health security science base, the BIP focuses considerable attention on establishing and maintaining systems for continuous monitoring, evaluation, and improvement. These issues are most fully addressed in Objective 10 (on science, measurement, evaluation, and quality improvement).

The next ten chapters comprise the heart of the Biennial Implementation Plan, with one chapter devoted to each of the 10 objectives listed earlier. Each chapter provides:

- An overview of the objective

- A discussion of the desired outcomes to be achieved in the next four years (i.e., prior to the next quadrennial National Health Security Strategy)
- The critical activities to be undertaken during the next two years to (i.e., prior to the next Biennial Implementation Plan)
- Closing thoughts about future directions for addressing the objective

The final chapter of the BIP recapitulates key themes and describes next steps in the continuing process of implementing the NHSS.

Appendix A contains a table that describes potential stakeholders who might have lead responsibility for particular activities as well as potential partners who could assist in achieving the activity.

OBJECTIVE 1: FOSTER INFORMED, EMPOWERED INDIVIDUALS AND COMMUNITIES

National health security begins with individuals and communities who are aware of and informed about health security risks and empowered to prepare for, respond to, and recover from these incidents. Informed, empowered individuals have the information and skills they need to protect their own health and safety. Informed, empowered communities have built strong neighbor-to-neighbor connections, and have contingency plans, communications plans, and provisions in place to shelter, sustain, and provide medical and other care for the entire community, including at-risk individuals. Achieving health security includes ensuring that the physical and behavioral health needs of all individuals as well as the functional needs of at-risk individuals are addressed. Achieving health security also entails creating a culture in which individuals understand the relationship between individual and community preparedness, and bystander response to emergencies is not the exception but the norm.

Progress toward the NHSS goal of building community resilience must begin with informed and actively engaged communities. This includes having community members who are involved in local decision-making and who have access to accurate, culturally relevant risk information. Resilient communities know what to do to prevent, protect from, respond to, and recover from health incidents.

Communities are defined geographically, but can vary greatly in size and composition. For purposes of this Biennial Implementation Plan, a community can refer to a neighborhood, city, or county, and its governmental and non-governmental partners. This specification should be determined locally based on how resources are allocated and given existing governance structures. All stakeholders, both governmental and non-governmental, are included in this conceptualization of “community.”

To achieve this objective, community members must be educated about health security risks and ways to prepare, respond, and recover. **Community education** is an ongoing process in which the community acquires knowledge about roles, responsibilities and expectations for individual preparedness as well as the ways in which individuals can work collectively with other community members to respond to and recover from a health incident. Community education should also include discussion of the legal issues associated with incident response and recovery. Health literacy provides an important foundation for community education. Health literacy involves three dimensions: the basic knowledge needed to fully understand and take action on health issues (conceptual foundations), the skills necessary to make public health decisions that benefit the community (critical skills), and the skills and resources necessary to address health concerns through civic engagement (civic orientation).⁵

⁵ D.A. Freedman, K.D. Bess, H.A. Tucker, D.L. Boyd, A.M. Tuchman, and K.A. Wallston, “Public Health Literacy Defined,” *American Journal of Preventive Medicine*, 36:5, 2009, 446-451.

Communities must be able to engage individuals, particularly those with functional needs, in planning for the response to and recovery from health incidents. This **community partnership** entails the active collaboration of government and non-governmental organizations (NGOs, including nonprofit community-based organizations, faith-based organizations, volunteer organizations, and for-profit business) to support community-level efforts for health incident response and recovery planning (including exercises). Communities can use partnerships and community networks to enhance **social connectedness** in the response and recovery phases. Robust social networks can be used for preparedness planning and subsequently leveraged during incident response and recovery.

Community members must know how to use risk information to take action with respect to individual and community preparedness and recovery. This **community empowerment** involves the active engagement of community members in developing preparedness plans at the individual and community levels. The active process of information receipt, uptake, and integration within the daily practice of individuals and organizations is a necessary complement to community education.

The desired outcomes referenced in the box below correspond to these four components of informed and empowered communities. The outcomes are intended to represent long-term endpoints for this objective, but they are not necessarily achievable in two or four years. The activities listed for each outcome area (shown later in the chapter) are the first steps towards achieving each outcome, and can be performed within the next two years.

Long-Term Outcomes for Fostering Informed, Empowered Individuals and Communities

- Community members are educated about health threats, including how to prepare, how to respond, how to recover, and where to turn for help for both themselves and their neighbors
- Strong community partnership and integrated plans for health security are in place for response and recovery
- Social networks are developed and effectively used to enhance community education and awareness
- Individuals and communities are empowered to effectively incorporate risk information into preparedness, response, and recovery plans

Community Members Are Educated About Health Threats

Factors such as disability, age, low socioeconomic status, culture, and linguistic isolation can shape communication and meaning, perceptions of risk, and the capacity to understand and act on public health messages. As a result, some individuals may be less likely or able to respond appropriately during a health incident. Communication during an incident is further complicated

by the range of information sources to which individuals might or might not have access, including alternative sources of information such as new social media (e.g., Facebook, Twitter); popular news media; language-specific media; or neighbors, friends, and family. Community education should involve a dialogue among members of the community about risks and how to best use resources and information to address the consequences of a health incident. This education must also include discussion of the legal risks for organizations participating in incident response and recovery.

The following activities will be undertaken during the next two years:

- **Ensure that communications about community risks and threats address the functional needs of at-risk individuals giving consideration to types of health threats and preferred or necessary modes of communication, culture, developmental age, trusted spokespersons/channels, preferred formats, and preferred languages.** This includes consistency with specifications for individuals with disabilities in Section 508 of the Rehabilitation Act. Section 508 is an accessibility law that was enacted to ensure that everyone has equal access to electronic information
 - Conduct formative research at the local level (e.g., community forums) to identify key populations, their information needs, effective media channels (including use of social media), and trusted spokespersons for both response and recovery periods
 - Develop educational materials on liability during health incidents to address concerns of the workforce, including volunteers
- **Incentivize communication that focuses on connections between individual and community preparedness.** These responsibilities include learning how to provide aid to neighbors, particularly those with functional needs
 - Determine how existing assets can be leveraged (e.g., funding, other) to motivate this movement towards community preparedness
 - Begin to provide templates for how to emphasize this connection between individual and community preparedness
- **Engage established and local organizations (e.g., cultural, civic, and faith-based groups, schools, and businesses) and social networks to develop and disseminate preparedness information and supplies (e.g., response kits with food provisions, etc.)**
 - Identify trusted sources of information and help encourage public involvement and open communication during and after a crisis
 - Train community-based messengers in risk communication principles and engage them to deliver health messages during and after a crisis

Strong Community Partnerships and Integrated Plans for Health Security Are in Place

Many local organizations become *de facto* first responders because of their proximity to an incident or connection to an affected population. Formalizing relationships between local, state, and federal public health, emergency response, law enforcement and other organizations involved in health security can improve their capacity to participate more efficiently in this area. Regional partnerships should be emphasized. At the same time, integrating organizations that have not previously been part of incident planning (e.g., faith-based organizations, private business, other NGOs with ties to the local community) can engage new partners into health security and increase local capacity.

Increased collaboration and integration across organizations (in both the public and private sectors, and across levels of government) can lead to the formation of new community partnerships, which can be leveraged for the benefit of the whole community. Establishing working committees with a representative, cross-sector population will ensure more coordinated emergency planning. Further, multi-sector collaboratives can be used to discuss the larger issue of community resilience and how to measure it.

The following activities will be undertaken during the next two years:

- **Establish a partnership (e.g., between local government agencies and NGOs, including private organizations) to conduct pre-event vulnerability assessments**
- **Develop guidance on best practices in active involvement of government and NGOs, including the private sector, in local emergency planning committees or other relevant bodies with a role in health security**
 - Include guidance on expectations for stakeholder involvement, with information on how to assess effective partnerships and how to maximize the roles and benefits of government and non-governmental leaders on these planning groups or committees
 - Guidance might also include specific examples from exemplary communities that could be adapted, and provide enough flexibility for local adoption (e.g., identifying existing resources provided by federal, state, and local authorities; determining ways to leverage dollars for dual use or benefit; building the capacity of NGOs as partners in health security; maximizing resources across government and NGO partnerships)
- **Convene representatives from national and local NGOs along with the cross-sector federal agencies to identify key outcomes for and measures of resilience;** use multiple approaches, including focus groups, webinars, and stakeholder meetings

Social Networks Are Developed and Effectively Used to Enhance Community Education and Awareness

Given the importance of social networks in disseminating risk information and aiding community members in the response and recovery phases, it is critical for communities to be able to assess the availability and robustness of neighborhood/community networks. These networks can be used to improve overall community resilience. The value of social networks, including the ways in which social media are used to engage and strengthen networks, is a hallmark of social connectedness and cohesion. With limited resources at this time, the activities over the next two years should focus on synthesizing existing knowledge about social network tools and identifying ways in which those tools can be accessed or leveraged.

The following activities will be undertaken during the next two years:

- **Assess the location and robustness of social networks, with attention to which community organizations will serve as lead agencies in disseminating risk information and resources to constituents for response and recovery**
- **Begin to identify a user-friendly methodology for assessment that can be used by diverse communities**
 - Identify a network analysis tool that can be used easily to gather information on their local networks, identify the ‘hubs’ or leaders in those networks, and determine which networks can be used to disseminate information to improve response and recovery
 - Develop guidance on best or promising strategies for identifying formal and informal networks and the lead actors in a network

Individuals and Communities Effectively Incorporate Risk Information Into Preparedness, Response, and Recovery Plans

While substantial progress has been made in the past several years in the development of risk communication messages and public education about health threats, there is a considerable gap in the use and integration of these messages in individual behavior and community planning. Ongoing analysis is needed of the ways in which communities are using risk information to improve plans, empower community members, and strengthen psychological resilience and preparedness activities.

The following activities will be undertaken during the next two years:

- **Identify the critical components in establishing a community's health security risk profile and develop a health security community risk profile template;** as described in the NHSS Interim Implementation Guide, this template will be derived from promising

risk methodologies and best practices that can be piloted and adapted in the community-level context⁶

- **Develop a plan to use risk communication measures to monitor the uptake and use of messages as part of improving community-level preparedness**

- This plan should pay particular attention to assessing if and how at-risk individuals are using information to address pre-incident vulnerabilities
- Assessment should also include monitoring messages around behavioral health and resilience generally

Conclusions and Future Directions

This chapter identifies four long-term outcomes as well as activities to begin to address these outcomes in the next two years. Ongoing efforts will be needed in future years to attain these outcomes.

Of the four outcomes, it is first critical to ensure that the public is educated about health security threats and that this education is provided in a form and context that is appropriate for diverse populations. In addition, public education is not unidirectional. It must entail routine assessment of how these messages are received and used for true community empowerment as well as the extent to which government agencies are aware of the resources and needs of their potential community partners. Recent disasters have highlighted the importance of governmental and non-governmental partnership in preparedness, response and recovery. Thus, this chapter outlines critical directions for forging and strengthening these community partnerships in the next two years.

Once these immediate efforts are underway in public education, community partnership, and social network development, it is important to consider activities directed at longer-term outcomes for future investment. Such activities address the underlying capacity of the population to communicate about and understand health security:

⁶ The *Interim Implementation Guide* lists the following steps to be taken by HHS in selecting and developing an appropriate risk assessment approach for health security (p. 11):

- *Review and compare state-of-the-art, health-related risk assessment methods and tools.* This review of recommended best practices should inform the NHSS' risk assessment approach
- *Rigorously field-test one or more approaches to risk assessment in communities.* Field testing of risk assessment tools and templates will help improve their effectiveness, generality, and feasibility of implementation
- *Develop a plan for broader implementation of the risk assessment tools/approach.* The plan should include key steps, responsibilities, and timelines

- 522 • Develop programs and policies to increase population health literacy to reduce
523 comprehension barriers, and to link population physical and behavioral health with health
524 security
- 525 • Build and support regionalized communication networks that link medical providers,
526 behavioral health providers, health officials, diverse publics, volunteers, and trusted
527 intermediaries
- 528 • Evaluate the ability of the community to use these networks to prepare residents for
529 health threats/incidents; strengthen plans for social networks to assist community
530 members in recovery, specifically to address health needs after an incident
531

**OBJECTIVE 2: DEVELOP AND MAINTAIN THE WORKFORCE NEEDED FOR
NATIONAL HEALTH SECURITY**

Our Nation's health security depends upon a sizable, competent workforce, which provides knowledge, skills, and experience across a variety of professions. The workforce is critical to national health security because the resilience of health and emergency response systems depends upon *people* to successfully employ the operational capabilities and accomplish the strategic objectives that support health security. Public health, health care, behavioral health, first responders, and volunteers must be uniformly proficient in their specialties; able to provide the essential services to the populations they serve; and ready, willing, and able to respond to major health incidents.

The national health security workforce encompasses the entire health system, and includes both permanent employees and volunteers in public health and health care as well as other disciplines such as pre-hospital emergency medical systems and emergency management. Day-to-day functions in the clinical and public health sectors provide the foundation for a secure health system, and planning for and responding to major health incidents should not come at the expense of routine care.

Developing and maintaining the workforce needed for national health security draws upon the following capabilities, as defined in the NHSS:

- Sufficient, culturally competent and proficient public health, health care and emergency management workforce
- Volunteer recruitment and management

Developing and maintaining the workforce needed for health security requires both qualified and proficient personnel and a sufficient number of personnel. A qualified and proficient health security workforce is ready, willing, and able to prevent, protect from, respond to, and recover from incidents with potentially negative health consequences. An adequately sized health security workforce has a sufficient supply of staff and volunteers to meet the everyday health needs of the population as well as a surge in demand for services. This chapter describes activities over the next two years to help achieve the long-term outcomes listed below.

Long-Term Outcomes for Developing and Maintaining the Workforce Needed for National Health Security

Outcomes that support a qualified and proficient workforce:

- Staff and volunteers understand their roles and responsibilities during all phases of health incidents and can perform them efficiently and effectively
- Staff and volunteers have received competency-based national health security training, with credentialing used to ensure competence

Outcomes to support an adequately sized workforce:

- Communities have an adequate number of staff and volunteers to perform the national health security capabilities, and can access and mobilize additional personnel as needed
- Ongoing recruitment efforts secure the supply of national health security professionals and ensure that the workforce is replenished with high-quality applicants trained in the most current technical skills
- The workforce reflects the demographic composition of the Nation and demonstrates an understanding and respect for cultural diversity
- A systematic approach, compatible across jurisdictions, is in place for coordination of volunteers at the local, state, and federal levels

Staff and Volunteers Understand Their Roles and Responsibilities During All Phases of Health Incidents and Can Perform Them Efficiently and Effectively

To achieve national health security, staff, volunteers, and the agencies and organizations in which they serve must understand and be able to perform their specific roles and responsibilities during all phases of an incident. Furthermore, each worker must be able to function as part of a larger, coordinated response in accordance with the National Incident Management System (NIMS). Effective incident response requires workers who are not only trained to fill pre-determined roles, but who can serve in additional roles, as required by evolving conditions. Cross-training is needed to help staff perform a variety of possible functions as dictated by the needs of the incident and to help foster a general culture of adaptability.

The following activities will be undertaken during the next two years:

- Develop and implement competency-oriented job descriptions and use them to evaluate staff performance and effectiveness
- Adhere to NIMS compliance training requirements in accordance with prescribed roles and functions within the incident management framework during an exercise or real incident
- Cross-train staff and volunteers to encourage flexibility and nimbleness

Staff and Volunteers Have Received Competency-Based National Health Security Training, with Credentialing⁷ Used to Ensure Competence

⁷ According to the National Incident Management System (NIMS), the credentialing process entails the objective evaluation and documentation of an individual's current certification, license, or degree; training and experience; and competence or proficiency to meet nationally accepted standards, provide particular services and/or functions, or perform specific tasks under specific conditions during an incident. Health professions have taken various approaches to credentialing that include licensing (for physicians and nurses), certification (for health education specialists), and registration (for dietitians and sanitarians). In addition, there are also a wide range of specialty

Health systems rely on the knowledge and skills of the workforce. Workers in health security must receive strong initial training as well as further skill-building opportunities. A broad training framework that articulates professional roles and competencies for health security and offers training and career development paths will help ensure that current and future workers are prepared to meet the challenges ahead. While most agree that curricula should be competency-based, there is less agreement on what those competencies are, how they vary by discipline, and how to align competencies with operational capabilities. Credentialing offers a means of identifying individuals who have demonstrated the ability to perform specific tasks or functions. In addition to competencies and credentialing, adherence to established training design and development standards, requirements, and guidelines, as well as better integration of training activities, will help support a proficient and effective workforce.

The following activities will be undertaken during the next two years:

- **Establish partnerships between colleges/universities and employers to offer health security-related courses and learning opportunities for practitioners and volunteers to further their education**
- **Synthesize existing data from research and other sources to generate health security competencies; develop new methods if/as needed to identify core health security competencies**
 - Complete, disseminate, and test initial Preparedness and Response Core Competencies to fulfill the Pandemic and All-Hazards Preparedness Act (PAHPA) mandate for “a competency-based training program to train public health practitioners”
 - Complete, disseminate, and test standardized all-hazard disaster core competencies for physicians, nurses, and emergency medical technicians (EMTs)
- **Adapt training to align with and support mastery of health security competencies**
- **Deliver and disseminate competency-based training**
 - Partner with academic programs and organizations to offer competency-based training and education to the health security workforce
 - Provide CEU credit for all relevant disciplines as an incentive to increase participation in health security-related trainings

certifications—credentials that identify those who have mastered some subset of knowledge and skills as demonstrated by a combination of study and examination (Gebbie K, Turnock B. 2006. *The public health workforce, 2006: new challenges*. Health Affairs 25:4 (923-933)).

- **Modify national health security training courses to increase access for practicing health care professionals**
- **Use exercises to demonstrate and measure behavioral outcomes of training**
- **Review existing learning management systems and assess the feasibility of creating an integrated and coordinated system to monitor health security competencies across sectors**

Communities Have an Adequate Number of Staff and Volunteers to Perform the National Health Security Capabilities, and Can Access and Mobilize Additional Personnel as Needed

The ability of the workforce to effectively mobilize in response to national health security incidents depends on having an adequate supply of staff and volunteers. Staff and volunteers must be able to perform national health security capabilities while continuing to carry out essential functions unrelated to the incident. Furthermore, workforce protection helps ensure that staff and volunteers are both *willing* and *able* to respond in the face of personal and logistical challenges.

The following activities will be undertaken during the next two years:

- **Identify the nature and scope of potential concerns from workers to serve during an incident; develop and begin to implement strategies to overcome any such resistance**
- **Conduct call-down/notification and assembly drills to test staff and volunteer mobilization**

Ongoing Recruitment and Retention Efforts Secure the Supply of National Health Security Professionals

Given the predicted shortages in core health capacities such as nursing, epidemiology, and laboratory sciences, ongoing recruitment and retention strategies are critical to ensure that there is a sufficient supply of qualified workers to meet everyday demands, as well as to respond to incidents that lead to a surge in demand for services. Barriers to recruiting, hiring, and retaining qualified staff include budget constraints, uncompetitive salaries, and lengthy processing times for new hires. Efforts to recruit volunteers to augment national health security capacity are essential to strengthening and sustaining health and emergency response systems.

The following activities will be undertaken during the next two years:

- Synthesize existing data from research and other sources to generate a more complete picture of the size and composition of the workforce needed for health security
- Conduct a gap analysis of resource/personnel needs to achieve national health security capabilities; for workforce areas identified as shortage areas or unevenly distributed, work with appropriate stakeholders to develop and then begin to implement specific strategies to increase workforce size or address distribution issues for such categories
- Develop effective strategies to retain public health practitioners and minimize turnover
 - Develop and employ strategies to improve employee satisfaction (e.g., loan forgiveness, continued education credit, flexible schedules)
 - Develop strategies to provide public health workforce with career incentives (e.g., salary adjustments, retention bonuses, promotions, and awards)
 - Create a career ladder for advancement in governmental public health
- Promote ongoing efforts to increase interest in the field of public health
 - Develop and implement programs (e.g., public information campaigns, high school and college visits, and shadowing opportunities) to reach potential hires earlier in their career choice and cultivate a positive perception of public health
 - Increase the visibility of public health careers and volunteer opportunities among school-aged children and young adults in the workforce
 - Sponsor public health internships and offer undergraduate degrees in public health

The Workforce Reflects the Demographic Composition of the Nation

It is also important to focus on ensuring that the national health security workforce is linguistically, culturally, developmentally (e.g., serving children), and economically sensitive to the communities it serves. Factors such as age, the social environment, physical environment, economic status, genetic predisposition, behavioral risk factors, and health care also influence health and well-being.⁸ Understanding and respect for this diversity and the underlying factors that influence health are critical to the performance of health security capabilities.

The following activities will be undertaken during the next two years:

- **Conduct recruitment and retention strategies with consideration of the demographic composition of the population served**

⁸ U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Public Health Performance Standards Program, *Ten Essential Services for Public Health* (accessed online 6/29/10 at <http://www.cdc.gov/od/ocphp/nphpsp/essentialphservices.htm>).

- **Partner with institutions serving culturally diverse populations to recruit a diverse workforce to health security-related fields**

A Systematic Approach Is in Place to Coordinate and Manage Volunteers

During and after a large-scale health incident, there is an acute need for volunteers, particularly for health care and behavioral health professionals. Given the anticipated need for significant numbers of additional personnel during a response, coordinated systems are necessary to recruit, roster (i.e., confirm identity, license, credential), train, and retain volunteers prior to an incident; deploy, track and support volunteers during a response; and demobilize volunteers once they are no longer needed. However, volunteer management presents challenges on multiple fronts. Many individuals and employers remain unaware of their community's need for volunteer personnel with different health care backgrounds and experience. Moreover, verifying and updating volunteer credentials can be time-consuming, and a team's readiness for deployment requires ongoing training. Volunteer training programs, as well as individual volunteers, must be evaluated according to core competencies and standards, which have yet to be developed.

The following activities will be undertaken during the next two years:

- **Implement ongoing efforts to recruit volunteers**
 - Take advantage of existing opportunities to increase awareness of opportunities to volunteer
 - Explore co-branding opportunities and joint activities between Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) and other federal programs (e.g., Medical Reserve Corps [MRC], National Disaster Medical System [NDMS])
 - Pursue collaborative partnerships with national membership organizations to encourage their members to volunteer at the state level
 - Engage hospitals, national and state associations, and private organizations in state ESAR-VHP planning efforts

Conclusion and Future Directions

This chapter identifies six desired outcomes that contribute to a proficient and adequately sized health security workforce and describes a set of key activities that should be undertaken to work towards achieving those outcomes. A common theme among the activities is to synthesize and align existing data and efforts to foster more coordinated and integrated frameworks and systems. Given resource constraints, leveraging already existing efforts rather than reinventing new ones will be key.

The activities laid out for the first two years of implementation provide the foundation for potential future activities, such as:

- 726 • Implement strategies to address workforce gaps
- 727 • Integrate health security competencies and standards into the accreditation of health
- 728 departments and hospitals
- 729 • Build the evidence base of effective training methods
- 730

OBJECTIVE 3: ENSURE SITUATIONAL AWARENESS

Situational awareness involves capturing, analyzing, and interpreting data to inform decision-making in a continuous and timely cycle. National health security calls for both routine and incident-related situational awareness. Situational awareness requires not only coordinated information collection to create a common operating picture (COP), but also the ability to process, interpret, and act upon this information. Action, in turn, involves making sense of available information to inform current decisions and making projections about likely future developments. Situational awareness helps identify resource gaps, with the goal of matching available and identifying additional resources to current needs. Ongoing situational awareness provides the foundation for successful detection and mitigation of emerging threats, better use of resources, and better outcomes for the population.

While significant progress has been made in developing the specific capabilities involved in situational awareness, there is a need and an opportunity for the federal government to assume a strong role in developing and building consensus around a common national approach to situational awareness for national health security. This approach would not be a shared database, but rather a common language, including a set of concepts, principles, terminology, expectations, and components. This approach should also include a minimal set of data elements and technological specifications, possibly in the form of a data dictionary and standardized protocols, which will help ensure interoperability of existing and newly developed information systems to facilitate sharing of situational awareness information. Accordingly, any effort to create a national approach will face the need to address jurisdictional and organizational differences in language and terminology, the type of information that is collected and reported, data storage formats, data security and validity, and other details. A federal data registry, which would merely define what information resides where, would assist in this endeavor by providing producers and consumers with a way to search, discover, and share information.

Situational awareness is a cross-cutting developmental effort whose data elements and information sources help define a COP. Although biosurveillance is a key component of this COP for biological incidents, other components of situational awareness, such as strategic and tactical communications and planning, are also crucial to the coordination and integration of resources, assets, and capacity needed to anticipate and respond to threats and actual health incidents regardless of origin and type. In some parts of this chapter, the biosurveillance model is used as a conceptual example of activities that are germane to situational awareness of other threats beyond the biological domain. For example, science-based and surveillance-focused situational awareness is also useful for the systematic early warning, characterization, management, and control of chemical, biological, nuclear, and other manmade and natural threats. Furthermore, effective situational awareness does not rely solely on the capacity of information technology systems, but also on a robust understanding of the health information universe (i.e., public health, clinical care, public safety, pre-hospital emergency care, and

hospital care) to enable integrated supervision and execution of actions during all phases of health security preparedness and response prior to, during, and post-incident.

In the case of biological threats and incidents affecting health, morbidity, mortality, security and the well-being of the population, there is also a need for disease reporting systems that collect, analyze, and report data *quickly* during a large-scale health incident to achieve near real-time awareness of evolving health events.⁹ Specifically, systems are needed to collect and quickly analyze data regarding available resources, match those data to current needs, and predict shortfalls. Finally, situational awareness requires coordination across levels and sectors, both private and public, as well as within the United States and with international partners.

This chapter describes activities over the next two years to help achieve the long-term outcomes listed below.

Long-Term Outcomes for Ensuring Situational Awareness

- Common national approach to situational awareness for national health security
- Near real-time awareness of evolving health incidents, including source, scope, key unknowns, risk assessment, triggers linking information to response timelines, and projection of future trends
- Near real-time awareness of availability of resources (both personnel and other) before and during health incidents, including both awareness of the current situation and projection of needs and anticipation of shortfalls
- Effective coordination of health-related situational awareness, including scalability from local to national levels, with communication running in both directions and laterally, and involving both the public and private sectors, as well as both the United States and global partners

These four outcomes are separated out for discussion, but their interdependencies suggest that they could easily be considered parts of a single, overarching outcome. A common national approach will lay the foundation for the other outcomes, as well as their respective activities, and hence should be a priority. Awareness of evolving health incidents has received the most attention to date, but there are still major gaps and a need to improve coordination across its many components. Awareness of resource availability and coordination of situational awareness also offer specific opportunities for improvement, building on the common national approach.

⁹ U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, *National Biosurveillance Strategy for Human Health* (NBSHH), Version 2.0 (February 2010) (accessed online 6/15/10 at http://www.cdc.gov/osels/pdf/NBSHH_V2_FINAL.PDF).

Common National Approach to Situational Awareness

Coordinating situational awareness on a national scale requires a shared *conceptual* approach, including common terminology, definitions, expectations, processes, and a minimal set of critical data. The approach should draw and build (although not exclusively) on the National Biosurveillance Strategy for Human Health (NBSHH)¹⁰ and its Concept Plan for Implementation,¹¹ as well as the existing frameworks presented in the National Response Framework¹² and the National Incident Management System.¹³ Important will be consideration of the types of decisions that need to be supported, who makes those decisions, what data are needed to support those decisions, and who needs what information. An information management plan would provide the methods and processes for collecting and managing information by describing the information flow and exchanges between organizations, detailing data security procedures, outlining roles and responsibilities, and specifying the products to be used to capture and disseminate information as well as the enabling infrastructure and tools for interoperability.

Near real-time awareness of a health incident and available resources, in turn, rely on low- and high-*technology* systems for sharing situational awareness information; these systems must be interoperable, redundant, and reliable. This approach does not require a common database, where data are submitted for common access. Instead, the model for a common national approach should include very specific requirements about how to link systems electronically, including specifying where linking is appropriate or not, providing applicable standards for doing so, and developing a process to guide how these will change over time. Federal leadership will be critical to ensuring coordination at both the conceptual and technological levels, while ensuring participation and buy-in from a broad range of stakeholders. However, there is currently no overarching organizational structure to ensure such coordination, and no entity currently has the authority to implement specific activities. To this end, a governance model is needed to ensure consistent management, coherent policies and processes, and broad stakeholder involvement. While the focus should not be exclusively on biosurveillance, the NBSHH Concept Plan provides one process for developing such a governance model. Ultimately, a goal

¹⁰ U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, *National Biosurveillance Strategy for Human Health* (NBSHH), Version 2.0 (February 2010) (accessed online 6/15/10 at http://www.cdc.gov/osels/pdf/NBSHH_V2_FINAL.PDF).

¹¹ U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, *Concept Plan for Implementation of the National Biosurveillance Strategy for Human Health* (January 2010) (accessed online 6/15/10 at http://www.cdc.gov/osels/pdf/Concept_Plan_V1+5+final+for+print+KMD.PDF).

¹² U.S. Department of Homeland Security, *National Response Framework* (January 2008) (accessed online 6/15/10 at <http://www.fema.gov/pdf/emergency/nrf/nrf-core.pdf>).

¹³ U.S. Department of Homeland Security, *National Incident Management System* (December 2008) (accessed online 6/15/10 at http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf).

of this common national approach would be to ensure a COP across all levels and sectors, allowing for local-level decision-making as well as aggregation up to state- and national-level situational awareness and action, based on a national information management plan and governance structure.

Any such approach needs to establish *minimum* expectations, keeping in mind the burden that might be imposed on various stakeholders from a resource standpoint. Consideration should be given to how frequently specific information will be needed in routine and incident-related operations (e.g., some information may not be needed on a day-to-day basis), balancing the benefits of information against the cost in dollars and effort to collect and integrate. Additionally, attention should be paid to ensure that current and future grants align with the approach, where possible, rather than creating sets of competing incentives.

The following activities will be undertaken during the next two years:

- **Establish a governance model for situational awareness activities in support of national health security**
- **Identify and address federal, state, territorial, tribal, and local legal, policy, and political barriers to a common approach, building off of existing efforts**
- **Develop a taxonomy of decisions and decision-makers (authority, sectors, levels of government) to assist in identifying who needs what information (and for what purposes), possibly as part of an information management plan**
- **Establish a consortium of state, territorial, tribal, and local health departments to compile, implement, and evaluate a suite of low-cost, easy-to-implement innovative practices that allow public health authorities to collect and analyze data relevant to national health security.** Practices may be grouped into modules, potentially including health status of the community, inventory and readiness status of local response assets, detection of potential and emerging incidents, threat-specific surge in active surveillance, and peri- and post-event situation reports
- **Draft and implement a conceptual and technological approach in consultation with stakeholders across all sectors, which will provide clear and consistent expectations for a situational awareness system, possibly through a set of guiding definitions and principles to which entities at all levels must adhere:**
 - Inventory existing systems, tools, registries, collaboratives, and programs, evaluating their effectiveness and appropriateness for a national situational awareness approach; identify and promote innovative practices
 - Develop minimal sets of data elements, which apply across all threats, but which can also be augmented for specific incidents. To fully specify, this will require consideration of stakeholders, their functional relationships, and their responsibilities, because functions and tasks will determine data requirements

- o Identify and align with relevant guidance and funding sources and, where necessary and possible, coordinate among those sources (e.g., DHS, DoD, VA, and elsewhere)

Near Real-Time Awareness of Evolving Health Incidents

The ability to respond quickly and effectively to a health incident requires responders and decision-makers to have immediate access to essential information about the incident. The type of information required will vary based on the nature of the incident (e.g., bioterrorism, hurricane, or outbreak of pandemic influenza). However, it is critical to have federal, state, territorial, tribal, and local government and private partnerships and systems set up and coordinated before a health incident to capture, process, and disseminate the information before and during the incident.

The following activities will be undertaken during the next two years:

- **As a means of facilitating and prioritizing evaluations, make an inventory of efforts related to health information systems and infrastructure, which will serve as a basis for future funding decisions**
- **Build upon existing situational awareness resources by pursuing new capabilities to generate actionable information across all relevant sources of information:**
 - o Identify R&D gaps, creating a research agenda to develop and enhance methods to decrease the time needed to identify, track, and respond to health threats (e.g., CBRNE¹⁴ laboratory methods)
 - o Develop Geographic Information Systems (GIS) (e.g., geospatial, demographic, and related geodata integration and presentation systems), communication information systems (e.g., data visualization, web technology, relational data systems, and integrated data management), and public health information systems (e.g., public health modeling, analysis, data sharing, and tracking systems) for use in understanding and responding to evolving health incidents
- **Strengthen and expand existing capabilities to disseminate and share existing health security information quickly**
 - o Develop approaches for interfacing with existing electronic information systems across all levels and sectors; these may include, but are not limited to, addressing the need to link records across systems; for example, provide public health laboratories access to common information systems (e.g., a Laboratory Information Management System [LIMS]) to send and receive laboratory test orders and results

¹⁴ Chemical, biological, radiological, nuclear, and high-yield explosives

- o Develop approaches to increase the timeliness of information sharing; incorporate operational tempos for incident-related situational awareness based on common systems that are used in routine operations
- o Support incentive programs for adopting common electronic information systems across all levels and sectors

Near Real-Time Awareness of Availability of Resources

Awareness of available resources (e.g., personnel, facilities, equipment, and supplies) includes not just those needed for the current situation, but also a projection of future resource needs and anticipation of resource shortfalls. Resource awareness needs a level of timeliness not seen in many current resource tracking systems, which are often best used retrospectively. Interoperability among existing systems is limited, especially across different levels and sectors. Furthermore, private interests control many assets that are needed before, during, and after health incidents, and proprietary interests can pose a significant barrier to timely, accurate, and effective resource awareness. Careful thought needs to be given to situations in which business considerations (e.g., competitor awareness of existing inventories) may conflict with the needs of national health security and incident response.

The following activities will be undertaken during the next two years:

- **Identify and, where necessary and possible, align existing federal, state, territorial, tribal, and local governmental and non-governmental systems, across sectors, for providing awareness of resources before, during, and after an incident:**
 - o Inventory and evaluate resource awareness systems used in the H1N1 response (e.g., available hospital beds, countermeasure reporting, vaccine distribution) to see what worked and what did not; generate ideas for how to improve these systems
 - o Identify gaps in existing information networks (both organizational and electronic)
- **Develop and implement an integrated resource tracking strategy that works across sectors and capitalizes on existing resources, including identifying a minimal set of resource data that cuts across situations**
- **Identify and address proprietary interests (e.g., for hospitals, pharmaceutical industry, large nationwide laboratories) that may inhibit incorporation of private resources, including approaches for carefully controlled data sharing and maintaining confidentiality of information**

Effective Coordination of Health-Related Situational Awareness

As noted above, a fundamental challenge to addressing health incidents is the number and diversity of individuals, agencies, and organizations engaged in both routine and incident-related situational awareness. Each stakeholder brings to the incident his or her own set of skills, terminology, goals, understanding of responsibilities, and expectations. Coordination among stakeholders, therefore, is critical to ensuring accurate, timely, and resilient situational awareness. Effective coordination should build upon a set of common guidance and tools, such as that provided by a common national approach, and make use of near real-time information about the characteristics of the evolving health incident itself and what available resources are available to respond to the incident. The ability to effectively coordinate should, therefore, increase with improvement in those other outcomes. Effective coordination must occur within and between the public and private sectors, within the United States, from local to national levels (with information flowing in both directions and laterally), and between the United States and other countries. The extent and limits of coordination must be evident and transparent to all of those involved.

The following activities will be undertaken during the next two years:

- **Involve private hospitals, laboratories, and other industries in national, state, territorial, tribal, and local planning efforts for integrated situational awareness systems,** encouraging use of these systems as they become available
- **Support a collaborative environment for sharing situational awareness information:**
 - Propose a funding mechanism to create and maintain this infrastructure
 - Establish a collaborative and/or contractual mechanism (may or may not include MOUs) for participation and information sharing
 - Develop and incorporate the role of Health Information Exchanges and Laboratory Information Exchanges in health security-related situational awareness
 - Explore business cases for hospital/clinical participation in situational-awareness systems

Conclusion and Future Directions

This chapter identifies four long-term desired outcomes as well as activities to begin to address each of these outcomes over the next two years. Ongoing and evolving efforts will be needed in future years to attain these outcomes.

Of the four outcomes, development of a common national approach was specified by subject matter experts as the first priority (see also the National Biosurveillance Advisory

Subcommittee).¹⁵ The other desired outcomes should build off of and benefit from this common approach. Within these outcomes, priority activities include (a) establishing a governance structure, (b) identifying legal and political barriers to a common national approach and (c) development of a taxonomy of decisions and decision-makers, which can provide the basis for identifying who needs what information and for what purposes.

Once a common national approach to situational awareness has been developed, it will be necessary to fully incorporate this approach into state, territorial, tribal, and local governmental and non-governmental planning. Future investments in interoperable information systems will increase visibility and facilitate the sharing of resources between partner agencies, companies, and organizations during an incident. Possible activities for future consideration include:

- Linking national health security information systems to the larger health information networks
- Integrating non-governmental situational awareness resource tracking systems into local, regional, or state architecture
- Developing approaches to incorporate community-level stakeholders in larger situational awareness endeavors

¹⁵ National Biosurveillance Advisory Subcommittee (NBAS), *Improving the Nation's Ability to Detect and Respond to 21st Century Urgent Health Threats: First Report of the National Biosurveillance Advisory Subcommittee* (April 2009) (accessed online 6/15/10 at <http://www.cdc.gov/osels/pdf/NBAS%20Report%20-%20Oct%202009.pdf>).

OBJECTIVE 4: FOSTER INTEGRATED, SCALABLE HEALTH CARE DELIVERY SYSTEMS

Modern health care delivery systems are composed of highly complex, costly, and diverse elements, including emergency medical systems (EMS), emergency departments, hospitals, community-based primary care, home care, long-term care facilities, behavioral health, and public health. Because it is not feasible to maintain large numbers of surplus beds, personnel, facilities, and equipment on a stand-by basis, it is essential that the various elements of the health care delivery system work efficiently on a steady-state basis to maintain the health of communities. Then, when a large-scale health incident occurs, these many components must work together to rapidly transition from providing individual-based care to meeting the needs of the greatest number of patients using the resources that are available.

Because large-scale health incidents can produce large numbers of victims in a short amount of time, health care delivery systems must be able to rapidly boost their capacity well beyond routine, day-to-day operations – a concept known as “surge capacity.” This must be done without compromising the delivery of vital services to at-risk individuals and the community. To achieve the objective of “integrated, scalable health delivery systems,” institutions and individuals that normally compete with each other in the health care marketplace must instead focus on working together to protect the public’s health and preserve national health security.

A health care system’s ability to surge is built on a foundation of effective and efficient daily operations and best addressed through prevention – by quickly detecting and containing public health threats, rapidly adopting countermeasures that mitigate health consequences, issuing effective crisis communications to avert panic, and properly informing citizens about when and where to seek needed care. It also depends on healthy communities that have equitable access to effective and efficient routine care, including psychological care. To this end, efforts to enhance the health care system’s capacity to respond to health incidents necessarily intersect with activities designed to improve ongoing day-to-day operations. It is unrealistic to create a parallel “disaster response system” that will only be invoked during a large-scale incident. Instead, the most prudent and economically sustainable way to ensure that the Nation’s health care system can meet the challenge of mass casualty care is by optimizing day-to-day operations, and creating and regularly testing the mechanisms required to accommodate major surges in demand when required.

Likewise, when surge occurs, it is best managed throughout the continuum of care. This includes a well-informed public equipped with tools for self-triage and self-care, a broad mix of health care providers who understand the needs of the populations they serve, accessible sites of care in the community to ensure that hospitals are not overrun with victims, adequate information technology and electronic health records (EHRs) to efficiently manage and track health care encounters, proper legal authority and protections for health care providers and public health officials, mechanisms to rapidly mobilize supplemental medical assets, mutual aid

agreements and emergency medical assistance compacts (EMAC) to marshal resources, and pre-defined “crisis standards of care” for use in extreme situations. Elements like these are not only useful in extreme situations; they are valuable for daily care as well. All Americans deserve access to safe, timely, and effective care. Ensuring that this happens will make our Nation better prepared and more resilient in the face of large-scale health security threats.

Unlike public health agencies and personnel, which largely reside in the public sector, most health care providers and hospitals in the United States reside in the private sector. Because delivery of health services is both costly and complex, private sector institutions and health care providers must be sensitive to economic considerations such as market share, rates of reimbursement, and the financial consequences of providing unlimited amounts of uncompensated care. With the exception of hospital-based emergency care, which is a legal right under federal law, health care providers are not obliged to treat patients who are unable or unwilling to pay. The complex economics of health care delivery in the U.S. have contributed to overcrowded emergency departments, frequent episodes of ambulance diversion, and a nationwide shortage of specialist physicians willing to take emergency calls, and have also hindered costly capital investments such as EHRs. Despite these challenges, private sector involvement is crucial to organizing an effective community response to large-scale health incidents. This requires that health care providers and systems that normally compete with each other work together with each other and their public sector counterparts.

In order to foster integrated, scalable health care delivery systems, communities must develop or strengthen the following capabilities, as defined in the NHSS:

- Access to health care and social services
- Evidence-based behavioral health prevention and treatment services
- Medical equipment and supplies monitoring, management, and distribution
- Use of remote medical care technology
- Emergency triage and pre-hospital treatment
- Patient transport
- Medical surge
- Palliative care education for stakeholders
- Fatality management
- Monitoring of physical and behavioral health outcomes
- Application of clinical practice guidelines

This chapter describes activities that should be undertaken over the next two years to work towards achieving the following long-term outcomes.

Long-Term Outcomes for Health Care Delivery

- Routine medical and behavioral health care, including emergency care, is provided fairly

and efficiently based on need, situation, and available resources

- In a health incident, local providers and institutions are capable of quickly shifting their approach from individual-based care to one that provides the greatest level of benefit for the largest number of people with available resources
- Adequate legal protections and authorities relevant to delivering health care during emergency situations are in place and are understood by legal counsel and key decision-makers
- Public and private health care providers and stakeholders have formed partnerships and community health coalitions to support the delivery of mass casualty care

Each of the four outcomes under this objective is discussed separately; however, the first – “On a day to day basis, medical and behavioral health care is provided fairly and efficiently based on need, situation, and available resources” – is a prerequisite to the other three. The second outcome, which defines a community’s capability to quickly shift from normal standards of care to an approach that provides the greatest level of benefit for the largest number of people, is the major focus of this chapter. The last two are ‘support’ outcomes, which are essential to enable an effective medical response to a large-scale health incident.

Routine Medical and Behavioral Health Care, Including Emergency Care, Is Provided Fairly and Efficiently Based on Need, Situation, and Available Resources

Poorly functioning health care systems cannot be expected to “rise to the occasion” when a health incident occurs. But in much of the Nation today, hospitals are filled to capacity, ambulances are regularly diverted from one overloaded emergency department to the next, and physicians are unable to take emergency department call. This must change.

Communities with well-functioning public health and health care delivery systems, supported by electronic health records, modern health information technology and cooperative agreements, can be expected to be more resilient, better able to respond during an incident, and more likely to swiftly recover than communities that lack these strengths.

Enhancing daily health care system performance takes time, effort, and resources, but the results are worthwhile. In addition to enhancing resilience, efficient and effective health care benefits countless patients on a day-to-day basis. Communities with well functioning health care systems can avert many incidents through prevention, prompt detection, containment, and early mitigation of emerging threats. Early and effective action may also limit the number of victims who need hospital care during an incident. Furthermore, if and when an incident occurs, communities with preexisting plans, established relationships, and robust infrastructure are better able to boost their capacity above normal limits and save lives.

The following activities will be undertaken during the next two years:

- **Continue to identify barriers to adopting electronic health records and develop plans to begin to address them**
- **Strengthen information management to improve medical decision-making at the operational and policy level**
 - Identify the operational and policy questions that must be answered in four key areas: 1) patient tracking, 2) medical care operations, 3) asset and supply chain management, and 4) bed and provider availability on a regional basis
 - Determine the data required to answer these questions
 - Ensure the alignment of systems to acquire and process needed data

In a Health Incident, Local Providers and Institutions Can Shift to an Approach that Provides the Greatest Level of Benefit for the Largest Number of People with Available Resources

To ensure that the affected population receives safe and effective care throughout the duration of a large-scale health incident, essential medical care resources must be available *when* and *where* needed. Ensuring the provision of care requires collaboration and coordination among all response partners and processes and systems. Responders must be able to quickly assess needs; make fair and informed decisions regarding allocation of resources; mobilize and deliver resources quickly and efficiently; and track resource use and impact. Essential resources required during a mass casualty incident include:

- **Staff:** licensed health care professionals, EMS personnel and support staff to provide patient care
- **Space:** to deliver triage and treatment of patients and to accommodate families
- **Supplies:** necessary for patient care, such as oxygen, IV fluids, gloves, pharmaceuticals, ventilators and other biomedical equipment
- **Services, systems and infrastructure:** needed to support the delivery of medical care (e.g., transportation, security, power, water, sanitation). In this context, infrastructure not only pertains to physical and logistical assets, but the decision-making capacity to optimize their use

The following activities will be undertaken during the next two years:

- **Establish a taxonomy of terms and measures to assess a health care delivery system's capability to deliver medical care disasters and other public health emergencies**
- **Develop simple, phased, and practical plans for rapidly expanding health system capacity, based on objective baseline assessments, realistic targets for expansion, and rigorous exercises and tests to verify that systems can meet these targets**

- o Develop and refine models that jurisdictions can use to conduct baseline assessments of readily available resources for expanding capacity
- o Provide communities with guidance, templates, and technical assistance on how to conduct these assessments
- o Explore options to encourage hospitals to improve day-to-day emergency care capacity as part of a strategy to quickly expand surge capacity in response to a large-scale health incident

- **Develop mechanisms to swiftly reimburse health care providers, institutions and suppliers for care, supplies, equipment, and services delivered during a large-scale health incident**

Adequate Legal Protections and Authorities Relevant to Delivering Health Care During Emergency Situations Are In Place and Are Understood by Legal Counsel and Key Decision-makers

Modern health care delivery systems are regulated through a web of federal and state laws and regulations that widely vary from state to state. Most health care facilities must also meet standards set by accrediting bodies. Under normal conditions, health care delivery functions in a complex legal environment fraught with potential professional, organizational, and institutional liability. During major health incidents, the legal environment becomes even more complex as special procedures are invoked and legal authorities are activated. It is frequently unclear to health care providers, key decision-makers, and those providing legal counsel what flexibility exists to take needed steps during an incident.

Issues regarding legal protections and authorities are common to most of the NHSS objectives. In this chapter activities are focused on legal issues specific to providing health care during emergency events.

The following activities will be undertaken during the next two years:

- **Identify current efforts by states, academia, legal experts and others to address the complex legal issues that arise during large-scale health incidents; initiate and support a coordinated approach to addressing these issues, and develop clear and consistent guidelines for future incidents**
 - o Areas of particular concern regarding the delivery of health care include: allocation of scarce medical resources, crisis standards of care, establishment of alternate care sites, health information sharing versus privacy, organizational liability, and procedures to facilitate reimbursement for transport and care of out-of-state patients
- **Clarify the circumstances that trigger waivers to existing federal laws and the process for initiating such waivers**

- o Identify emergency situations under which the absence of waivers can impede response and recovery efforts

Public and Private Health Care Providers and Stakeholders Have Formed Partnerships and Community Health Coalitions to Support the Delivery of Mass Casualty Care

Under surge conditions, a collaborative and coordinated effort will be needed; one that engages all parties involved in delivering health care in the community. The effort must address the full continuum of care – beginning with 911 call/referral centers and the scene of the incident to emergency departments, off-site urgent care centers, primary and specialty care offices and clinics, to hospitals, long-term care facilities, and finally, home care. In situations where the demand for medical care is high and health care resources are scarce, collaborative management will be essential to maximize benefit to the affected population. Proper utilization of the health care system – including matching the need for care with the appropriate setting – can facilitate the system’s ability to surge and boost capacity. However, such a response is unlikely without pre-established relationships and advance planning among local public health officials, health care providers, EMS, and businesses and organizations that provide goods and services to the community. Health care partnerships/coalitions at the local level are vital to produce a coordinated and integrated response that can be integrated with state and federal actions.

To achieve this outcome, the following activities will be undertaken during the next two years:

- **Create a national network of community health care coalitions**

- o Identify and build upon current efforts to expand the number of community health care coalitions
- o Identify and archive exemplary practices and successful models for developing and sustaining health care coalitions and create strategies for dissemination
- o Establish mechanisms to encourage communities with successful health care coalitions to help communities that lack such partnerships
- o Develop initiatives to engage national-level representatives from a broad range of private sector and other non-governmental stakeholders (e.g., medical, nursing, EMS organizations, relief groups, and business associations) to collaboratively identify strategies to increase the participation of their respective members in local health care coalitions

- **Identify options and strategies to create incentives – financial and otherwise – for health care providers, legal counsel, non-governmental organizations, businesses and other key stakeholders to participate in national health security activities through health care coalitions**

Conclusion and Future Directions

This chapter outlines the foremost challenges and barriers that must be addressed to achieve this objective. Many, if not most, are related to the complexity and diversity of modern health care delivery systems and the recognition that the majority of health care assets and medical care resources in the United States reside in the private sector. The activities described above are intended to: 1) clarify the structures, functions, and capabilities of existing health care delivery systems; 2) promote the integration and coordination of normally competing systems in the face of public health threats; and, 3) promote the development of community coalitions and other strategies to enhance public-private collaborations.

Achieving this objective will take a considerable investment of time and effort—at all levels. It will also require the good faith efforts of health care providers and institutions, non-governmental organizations, businesses, elected officials, and community leaders. Financial investments must be shared between the public and private sectors; however, government agencies may need to provide leadership to ensure progress.

Possible activities for consideration in future implementation plans include:

- Engage private sector health care partners in identifying “dual-use” strategies to improve day-to-day emergency care capacity while simultaneously increasing surge capacity for large-scale health incidents
- Provide funding to conduct an inventory of successful health care and public health practices, protocols/procedures, tools, etc., and to develop a “one-stop-shopping” website for archiving and disseminating materials, sharing ideas, and providing technical assistance
- Provide start-up guidance, and possibly funding, to establish self-sustaining local health care coalitions

OBJECTIVE 5: ENSURE TIMELY AND EFFECTIVE COMMUNICATION

Lessons learned from recent incidents such as 9/11, Hurricane Katrina, and H1N1 highlight the important role that communication plays during a response. Effective communications both among responders and between responders and the public are critical to nearly every aspect of national health security. They support and enable the full range of capabilities needed to respond efficiently and effectively to an incident.

Effective communication entails providing high-quality information (e.g., accurate, credible, understandable, actionable) to elicit the appropriate response on the parts of individuals, families, communities, and governments before, during, and after an incident. It relies on the integrated understanding of what motivates human behavior. It is a multidimensional concept that includes both social and technological components.

Ensuring timely and effective communications draws on the following capabilities, as defined in the NHSS:

- Emergency public information and warning
- Interoperable and resilient communications systems
- Communications among responders

Since 2001, federal, state, and local governments have invested heavily in improving their ability to communicate effectively. While these investments represent an important step forward in ensuring timely and effective communications, challenges and gaps remain. This chapter lays out a set of activities that builds upon the many existing efforts, refining and expanding them to further improve communications.

Successfully achieving the objective of timely and effective communications requires successful outcomes in both communication with the public and among responders. The following list represents the desired long-term outcomes that together will enable timely and effective communications in support of national health security. Four of the outcomes are associated with high-quality, effective communication with the public and two associated with effective communication among responders.

Long-Term Outcomes for Ensuring Timely and Effective Communications

- High-quality communication with the public
 - Regular information exchange with the public
 - Accurate, credible, understandable, and actionable information is provided to the public in a timely way
 - Information provided to the public is coordinated and consistent across all response organizations

- o Information reaches all members of target population; including at-risk individuals
- Secure, sustainable, interoperable, and redundant systems/equipment
- Effective communication within and across all response organizations

In the following sections these outcomes are described in more detail, and concrete activities to be conducted over the next two years in support of that outcome are identified.

High-Quality Communication with the Public

Regular Information Exchange with the Public

As described in the NHSS, effective communication goes beyond the dissemination of messages to the public to include regular information exchanges with the public and the development of trusted networks that facilitate the public's ability to communicate with responders at all levels of government before, during, and after an incident. A great deal of resources has been devoted to developing the capability to develop and disseminate messages to the public. Much less attention has been paid to improving the ability to receive and effectively integrate information from the public.

The activities described below are intended, over the next two years, to encourage and facilitate information exchange with the public. While the information exchange occurs primarily at the community level, the federal government will play a critical role in facilitating the exchange by developing resources to assist communicators at the local level.

- **Identify, collect, and disseminate successful strategies/practices for receiving information from the public both routinely and during an incident**
- **Identify and access existing communication networks (both formal and informal) that include health officials, behavioral health experts, community leaders, community-based organizations, and the public**
 - o Work to develop trusting relationships among all parties before an incident occurs (e.g., work together on non-emergency issues and activities)
 - o Engage network members in communications planning, message dissemination, and providing feedback from the field (e.g., on how message is being received)
 - o Identify gaps in communication networks and engage with partners to fill them
- **Develop and disseminate methods to effectively monitor for and address rumors and misperceptions circulating during an incident**

Accurate, Credible, Understandable, and Actionable Information Is Provided to the Public in a Timely Way

During an incident, agencies at all levels are expected to rapidly and regularly provide information to the public with the objective of preventing further illness, injury, or death, and reassuring the public that authorities are mounting a coordinated response. Message quality and timeliness are both critical to effective risk communication in an incident. The attributes of quality risk communication are that the message is accurate, credible, accessible to diverse audiences, and provides actionable information. Timeliness is critical, particularly in the initial phase of an incident when there is likely to be confusion among the public and intense media interest. Message quality and timeliness, however, are often at odds in a crisis, as the urgency of the incident does not allow a lengthy message development process. As a result, it is important to take actions in non-emergency times that will facilitate the timely development and dissemination of high-quality messages in an incident.

The activities described below are intended, over the next two years, to improve the ability to disseminate high-quality messages in a timely fashion.

- **Expand and maintain an online library of communication resources**

- Identify, collect, and disseminate best practices and exemplary materials for risk communication, including materials and dissemination mechanisms designed for at-risk individuals
- Maintain and update as needed a compendium of accessible, understandable, and rigorously tested message prototypes for a range of plausible scenarios that can be quickly adapted in the event of an incident; to maximize value, ensure that message prototypes are flexible and can be easily adapted once the incident (e.g., the severity of a pandemic) is characterized

- **Build capability to rapidly test and/or evaluate messages so that they can be adapted as needed during an incident**

- Facilitate and encourage research to develop methods for rapidly testing the effectiveness of risk communication messages; potential strategies for consideration include:
 - Establish internal networks to informally test messages
 - Establish agreements with professional associations to evaluate the comprehensibility of communications targeted at their stakeholders
 - Establish collaborative relationships with community partners to provide rapid feedback on message effectiveness
- Identify and pursue strategies to address any barriers to obtaining rapid feedback
- Develop and disseminate guidance for state, territorial, tribal, and local governments based on this research

- **Facilitate and encourage research to evaluate the effectiveness of existing risk communication training programs; maintain, expand, revise, or discontinue as warranted by study results**
- **Engage behavioral health subject matter experts in communication planning and message dissemination**

Information Provided to the Public Is Coordinated and Consistent Across All Response Organizations

It is critical that response organizations at all levels coordinate their efforts throughout the entire process of message development and dissemination. Such coordination saves time and resources because there is less duplication of efforts in message development (e.g., multiple entities developing similar messages). It also minimizes the possibility of conflicting messages creating confusion among the public and reducing public trust in key information sources. Formalizing the processes through shared plans and tools such as memoranda of understanding (MOUs) can help to ensure that coordination is institutionalized, rather than based only on personal relationships that can fade away with staff turnover.

The activities below are intended, over the next two years, to improve message coordination and consistency. The first two focus on improving communications planning so that roles, responsibilities, and processes are well understood among all relevant actors. The third focuses on the use of the website www.phe.gov to coordinate and disseminate messages.

- **Develop emergency communication plans that coordinate message development and dissemination strategy across all levels of government and with community partners**
 - Actively engage community partners in communications planning
 - Ensure that the process/system for coordinating message development (i.e., who is developing what message) across the federal, state, territorial, tribal, and local levels during an incident is transparent and minimizes duplication of effort
 - Evaluate the effectiveness of the RSS feeds¹⁶ and other new technology in providing a coordinated and consistent message; if found to be effective, develop a strategy for expanding use of such tools
- **Test crisis and emergency risk communication plans through drills/exercises; include relevant community partners in exercises**
 - For each exercise, develop an after action report and an improvement plan to addressing any problems/issues that arose

¹⁶ RSS, or Really Simple Syndication, is a web feed technology used to publish works such as blog entries, news headlines, audio, and video that are frequently updated.

- o Monitor implementation of actions in the improvement plan
- **Maintain and expand, as appropriate, the website www.phe.gov, which aggregates all health security information and serves as a one-stop site where the public can find preparedness, response, and recovery information**

Information Reaches All Members of Target Population, Including At-Risk Individuals

As described in the NHSS, effective risk communication involves being able to reach all segments of the affected population, especially persons with limited English proficiency and individuals with disabilities, in ways they trust and understand. Reaching all people means that the message must be accessible both technically and cognitively. That is, it must come through the appropriate and trusted channels for the population and it must be understandable and culturally appropriate. Messaging should be consistent with specifications for individuals with disabilities in Section 508 of the Rehabilitation Act. Section 508 is an accessibility law that was enacted to ensure that everyone has equal access to electronic information. In most cases reaching all members of the target population will require the message to be delivered in a variety of formats through a number of different channels. To do this effectively, local agencies must have a good understanding of who is in their community and what their communication needs are.

The activities below are intended, over the next two years, to improve the ability of response and recovery organizations at all levels to reach all segments of the population with effective communications.

- **Facilitate and encourage rigorous formative research to identify information needs, effective media channels, and trusted spokespersons for the range of population groups within a community**
- **Explore options for more effective use of media channels (including social media such as Twitter and Facebook) in disseminating public health messages**
 - o Determine whether there is a need for new policies and procedures to guide the use of different media channels, including social media
 - o Develop, evaluate, and disseminate training/guidance on strategies for the effective use of media channels to disseminate public health messages
- **Translate relevant research (e.g., health literacy) and scientific guidance to be easily understandable and implementable in practice for a range of populations, while still maintaining accuracy; disseminate to state, territorial, tribal, and local personnel. Potential strategies include:**
 - o Educate scientific and legal staff/reviewers on audience needs, trade-offs between information precision/completeness and information overload

- 1417 o Include brief explanations of the scientific rationale and risk communication
- 1418 principles behind pre-developed message prototypes
- 1419 o Disseminate guidance with pre-developed message prototypes that indicates
- 1420 which portions of the message should be tailored to the context and which parts
- 1421 should be consistent
- 1422 o Identify, collect, and disseminate health literacy best practices
- 1423 • **Actively engage population representatives in identifying and addressing any**
- 1424 **communication issues/concerns**
- 1425 o Solicit input on and strategies for addressing specific communication needs for
- 1426 different populations within a community
- 1427 o Solicit input on communication issues and strategies for addressing them that
- 1428 are likely to affect emergency responders who are assisting individuals with
- 1429 special communication needs
- 1430 o Establish a network of community representatives to provide input on cultural
- 1431 sensitivity, accessibility, comprehensibility, and appropriate delivery
- 1432 mechanisms and to serve as trusted information disseminators during an incident

1434 **Secure, Sustainable, Interoperable, and Redundant Systems/Equipment to**

1435 **Support an Efficient Response**

1436 Coordinated communications within and across response organizations are needed to support

1437 timely situational awareness and efficient response to an incident. To support such

1438 communications, the technologies – equipment and systems – need to be secure and sustainable.

1439 Moreover, they must be redundant to minimize the risk of critical breakdown.

1441 Interoperability is one of the key challenges to effective communications across organizations.

1442 Building interoperable systems is difficult because it requires coordination among a diverse set

1443 of response and recovery organizations with different missions and priorities. Moreover, the

1444 emergency communication funding streams for those organizations are very often siloed by

1445 discipline. Without a common understanding of emergency communication priorities across all

1446 federal agencies, the funding silos increase the likelihood of duplicative, inconsistent, or even

1447 contradictory efforts.

1449 The following activities are intended, over the next two years, to support the further development

1450 and use of secure, sustainable, interoperable, and redundant systems/equipment.

- 1451 • **Coordinate emergency communications grant priorities and guidance across all**
- 1452 **U.S. government departments and agencies**
- 1453 o Develop common criteria for all contracts and grants supporting emergency
- 1454 communications

- **Facilitate and encourage research to identify innovative and effective strategies for inducing non-governmental emergency responders (e.g., hospitals) to invest in interoperable communications technology**
- **Develop appropriate communication caches that can be used by rapid assessment teams to support no-notice incidents such as earthquakes and chemical or biological attacks**

Effective Coordination and Communication Within and Across All Response Organizations

As described above, communication technologies play a key role in supporting coordinated communications within and across response organizations. Technology, however, is not sufficient in itself to allow communication to occur. There is also a social side to responder communications that is equally important. That is, for effective communication to occur there must be strong pre-existing relationships between all response and recovery organizations. These relationships facilitate trust and promote information sharing. Building relationships across the diverse organizations involved in a response, however, can be challenging. It requires engaging all relevant actors and bringing them together to clearly define roles and responsibilities, gain a better understanding of each organization's mission and perspective, and develop a set of common goals. Tools such as MOUs can be useful in formalizing such relationships and facilitating the achievement of these goals.

The activities for the next two years below build on existing efforts at the federal and state levels to coordinate and enhance communication across response and recovery organizations.

- **Ensure that public health and medical care emergency communication roles, responsibilities, and activities are coordinated and consistent across relevant response frameworks (e.g., NHSS, National Response Framework)**
- **Integrate health care and public health organizations more fully into activities and programs run through the Office of Emergency Communications in the Department of Homeland Security**
 - Expand the governance (i.e., Executive Committee and/or Emergency Response Council) of SAFECOM, a program housed within the Office of Emergency Communications, to include representatives of health care and public health organizations
- **Implement and refine Statewide Communication Interoperability Plans (SCIPs)**
 - Ensure that all relevant health care and public health organizations are integrated into the governance, implementation, and refinement of the SCIP

- 1491 o Conduct communications-specific exercises to test capabilities and identify gaps
1492 and challenges. Develop and implement improvement plans based on the results
1493 of the exercise.

1494

1495 **Conclusion and Future Directions**

1496 This chapter lays out six long-term outcomes; four associated with high-quality, effective
1497 communication with the public and two associated with effective communication among
1498 responders. For each of these outcomes, a set of supporting activities to be accomplished over
1499 the next two years is identified. While these activities represent an important step forward,
1500 ongoing efforts will be needed to achieve the objective of ensuring timely and effective
1501 communications.

1502

1503 Effective communication relies on the coordination of a wide range of actors. Such coordination
1504 can be difficult when the actors involved have varying missions, priorities, and perspectives.
1505 Improving coordination thus requires engaging all relevant actors and building relationships that
1506 facilitate trust and a better understanding of each other's roles and responsibilities and how they
1507 interrelate. Providing opportunities for all stakeholders to actively participate in the process is
1508 integral to building trust. If the engagement process is superficial, it can do more harm than
1509 good. Efforts to engage the relevant actors and build trusting relationships must begin now;
1510 however, this process must be ongoing and will require continued efforts to sustain these
1511 relationships and realize their true benefits.

1512

1513 **OBJECTIVE 6: PROMOTE AN EFFECTIVE COUNTERMEASURES ENTERPRISE**

1514

1515 *The countermeasures review document will feed into this section when it is completed.*

1516

1517

**OBJECTIVE 7: ENSURE PREVENTION OR MITIGATION OF ENVIRONMENTAL
AND OTHER EMERGING THREATS TO HEALTH**

Environmental and emerging threats to national health security – such as infectious diseases and environmental hazards¹⁷, including threats to food safety and the misuse of life sciences information and technology – can arise from many sources. Some of these threats are already well characterized; others are less understood or novel. Both types of threats are addressed in this plan, which focuses on implementation activities to help understand, prevent/mitigate, detect, and respond to those threats for which progress in key areas can be made over the next two years.

Emerging and reemerging infectious diseases are and will remain a leading cause of death worldwide. Examples of emerging infectious diseases include severe acute respiratory syndrome (SARS), West Nile and Chikungunya virus infection, and the 2009–2010 H1N1 influenza pandemic, all of which are zoonotic in origin.¹⁸ Reemerging infectious diseases include malaria, tuberculosis, dengue, and HIV/AIDS. Also included are diseases that result from the emergence of antimicrobial drug-resistant pathogens.

Environmental hazards include threats to human health from food and food products; pathogens and other contaminants in water, air, and soil, such as dioxins; endocrine disrupters; heavy metals; mold; ozone; and pesticides.

Environmental hazards and other emerging threats to emergency responders and health care workers pose special concern because of both increased worker vulnerability to many threats and the potential effect of such hazards on mitigation and response. The *misuse of life sciences information and technology* refers to the deliberate exploitation of biological materials, knowledge, or technology for harmful purposes.

Because environmental and emerging threats take many forms and can impact multiple aspects of health security, activities in the area of environmental and emerging threats relate to, support, or are supported by many of the activities identified to address the objectives related to Informed Communities, Workforce, Situational Awareness, Countermeasures, and Global Partnerships. In addition, the diverse nature of environmental and emerging threats and the multiple sources from which they arise make an interdisciplinary approach consistent with a “One Health” framework and appropriate for developing activities in this area.

¹⁷ Environmental hazards are threats to food, water, air, soil, plant and animal safety and health, climate change, and occupational hazards.

¹⁸ Zoonotic infections are defined as “any disease or infection that is naturally transmissible from vertebrate animals to humans and vice-versa is classified as a zoonosis.” See <http://www.who.int/zoonoses/en/>.

Successful prevention or mitigation of environmental and other emerging threats requires the achievement of the four long-term key outcomes highlighted in the box below.

Long-Term Outcomes for Ensuring the Prevention, Mitigation, and Recovery from Environmental and Other Emerging Threats to Health

- Enhanced risk analysis and research to improve understanding and anticipation of environmental and emerging threats
- Improved mechanisms to prevent and mitigate existing and novel environmental and emerging threats, including those relating to food safety and resulting from the misuse of life sciences information and technology
- Enhanced ability to detect and report environmental and emerging threats early and to characterize them fully
- Improved ability to respond and recover effectively and efficiently to health incidents caused by environmental and emerging threats

The activities listed under each outcome below are representative of activities that will both help achieve these outcomes and can be undertaken within current budgets over the next two years.

Enhanced Risk Analysis and Research to Improve Understanding and Anticipation of Environmental and Emerging Threats

Enhancing the Nation's ability to anticipate and understand environmental and emerging threats requires enhancing the techniques and application of risk analysis as well as research on these threats.

The following activities will be undertaken during the next two years:

- **Strengthen and integrate risk analysis techniques**
 - Develop and test new techniques, tools, and templates for assessing and managing individual, community, and national health security risks
 - Integrate and, to the extent reasonable, homogenize risk analysis tools already in use
 - Extend the use of risk analysis tools and techniques for environmental and emerging threats at the local, state, tribal, territorial, and federal levels
 - Expand training on risk assessment, risk communication, and risk management
 - Improve methods for risk assessment of high-containment laboratories
 - Develop an integrated risk-management approach for preventing threats that could result from a breach of biosecurity, biosafety, or biocontainment
- **Capture ongoing research and develop an agenda for new research to expand knowledge of factors contributing to the development of threats, including physical**

and social environmental, and biologic and genetic factors. Initial areas for consideration include:

- Emerging and reemerging infectious diseases, including zoonotic and agricultural diseases and antimicrobial drug-resistant pathogens
 - Improve understanding of factors contributing to microbial resistance
 - Promote understanding of the ecology and risk factors for virus and prion transmission from domestic and wild animals to humans, and vice versa
 - Increase understanding of the role of changing insect vectors
 - Increase understanding of pathogenesis, immunology, and therapeutics for emerging and reemerging infections
 - Improve mechanisms for informing the public health and medical communities about emerging and reemerging infectious diseases
- Environmental hazards
 - Develop improved models for and reports on the burden and cost of foodborne illnesses and attribution of illnesses to particular food types
 - Increase understanding of the adverse health effects of exposure to physical and biologic environmental hazards
 - Expand the role of basic, clinical, community-based, and integrated research in environmental health sciences
 - Develop sensitive markers of environmental exposure, early biological response, and genetic susceptibility
 - Improve understanding of laboratory incidents by obtaining and analyzing information to enable trend analysis with a goal of minimizing the number of future incidents
 - Conduct research to enable the development of improved and more optimal use of existing personal protective equipment
 - Increase understanding of the human health effects of climate change

Improved Mechanisms to Prevent and Mitigate Existing and Novel Environmental and Emerging Threats

Because environmental and emerging threats arise from multiple sources via multiple routes of exposure, a multi-level interdisciplinary approach to prevention and mitigation is needed to guide the Nation's activities.

The following activities will be undertaken during the next two years:

- **Improve food and water safety**

- o Review Hazard Analysis Critical Control Point (HACCP) regulations and non-binding guidance, and identify opportunities to use this approach to modernize systems for protecting more types of food and water safety
 - o Increase the effectiveness of overseas inspection programs in high-risk areas to address the safety of imported food at the point of origin
 - o Revalidate previously conducted vulnerability assessments and, as feasible, conduct new assessments for food and feed commodities
 - o Protect food safety and improve food defense by issuing additional guidance documents
- **Improve control and mitigation of zoonoses and other infectious diseases**
 - o Develop a plan to improve management of animal and plant importation into the United States and within the United States, including legal and illegal, and intentional and unintentional transport
 - o Improve efforts to manage and prevent the emergence and reemergence of microbial threats and infectious diseases affecting plants, animals, and humans through strategies such as improved vector control
 - Facilitate awareness and knowledge, communication, and exchange of information across disciplines relating to human and animal health
 - Support efforts domestically and globally to build a highly skilled and sustainable global workforce focused on animal-human interface issues
 - Increase efforts to improve and integrate global human and animal systems and infrastructure
 - o Develop and implement strategies for combating resistance to antimicrobial drugs in pathogens affecting animals, humans, or both
 - Support detection and prevention activities related to health care, community, and veterinary antimicrobial resistance activities
 - Develop prevention strategies for antimicrobial resistance
 - Encourage antibiotic stewardship programs
 - Review policies on agricultural use of antibiotics
- **Improve the safety of workers during incidents and in the recovery phase**
 - o Ensure that all entities engaged in emergency response possibly involving hazardous materials meet OSHA Hazardous Waste Operations and Emergency Responder standards, and encourage the incorporation of standards at least as effective as these into state and private sector emergency plans
 - o Continue to pursue the development and improvement of personal protective equipment as well as administrative and engineering controls to protect workers

- 1653 o Ensure that workers and their families have access to necessary medical
1654 countermeasures, protective equipment, and training
- 1655 o Improve procedures for evacuation, shelter-in-place, and response and recovery
1656 for workers and their families
- 1657 o Enhance post-exposure monitoring of emergency responders to monitor for and
1658 mitigate longer-term health effects
- 1659 • **Prevent and mitigate health effects related to environmental hazards**
- 1660 o Reduce human, plant, and animal exposure to potential sources of environmental
1661 contaminants such as biological toxins, industrial and toxic chemicals, oil, and
1662 radiation, as well as pathogens in food, air, soil, and water
- 1663 o Mitigate the adverse health effects of exposure to physical and biologic
1664 environmental hazards
- 1665 o Reduce the risk of intentional and unintentional release of biological agents,
1666 industrial and toxic chemicals, oil, radiation, and other toxicants by improving
1667 safety and security related to potential sources of environmental contaminants
- 1668 o Review and, where necessary, enhance regulatory practices and environmental
1669 codes in cases where specific industrial risks may impact human health or
1670 sensitive natural resources
- 1671 • **Prevent and mitigate threats posed by the misuse of life sciences information and
1672 technology**
- 1673 o Implement July 2, 2010 Executive Order, “Optimizing the Security of Biological
1674 Select Agents and Toxins in the United States”¹⁹
- 1675 o Assess and integrate systems and procedures for ensuring biosafety, biosecurity,
1676 and biocontainment in high- and maximum-containment laboratories
- 1677 o Use insights gained from analysis of laboratory incidents to minimize the number
1678 of future incidents and share lessons learned with an overall goal of optimizing
1679 laboratory safety and oversight
- 1680 o Promote the ethical use of life sciences research and awareness of the potential
1681 impact of the growth and dissemination of scientific knowledge, including the
1682 possible conduct of dual use research of concern
- 1683 o Continue to improve the security and safety of work associated with select agents
1684 and toxins and other hazardous biological agents

¹⁹ The White House, Office of the Press Secretary, *Executive Order – Optimizing the Security of Biological Select Agents and Toxins in the United States* (July 2, 2010) (accessed 7/6/10 online at <http://www.whitehouse.gov/the-press-office/executive-order-optimizing-security-biological-select-agents-and-toxins-united-stat>).

- o Encourage efforts to monitor and control the exchange of genetic material that could be used as the building blocks for select agents using synthetic biology
- o Develop a national strategy to enable and ensure the appropriate training and technical competence of individuals who work in, oversee, support, or manage high- or maximum-containment research laboratories
- o Improve and share strategies to ensure effective public communication, outreach, and transparency about biosafety and biocontainment issues
- o Promote a culture of responsibility around and take reasonable steps to reduce the potential for malevolent exploitation of life sciences knowledge, research, materials, and technology
- o Work to ensure oversight of dual use research of concern in government, academic, and commercial laboratories

Enhanced Ability to Detect and Report Environmental and Emerging Threats Early and to Characterize Them Fully

Many of the activities required to detect, report, and characterize environmental and emerging threats more fully are related to the activities discussed in the chapter on Situational Awareness. There are, however, several aspects that are unique to environmental and emerging threats. Detecting zoonoses, for example, requires improved surveillance systems and data sharing on both sides of the human-animal interface as well as improved understanding of the geographic, seasonal, and other factors that influence the transmission and emergence of these diseases. While these activities are clearly relevant to situational awareness activities generally, more specifically they provide a better understanding of the potential risks that an environmental and emerging threat such as zoonoses poses to health security. Similarly, detecting and characterizing environmental hazards in air and water is an activity that generally supports situational awareness; however, exposures to hazards in air and water requires that specific surveillance activities are established to monitor and mitigate associated adverse health effects. Likewise, both the immediate detection and characterization of occupational hazards to emergency responders contributes to situational awareness of an incident; however, a long-term monitoring effort is required to detect and mitigate the adverse health effects that may emerge beyond the immediate response.

The following activities to be undertaken over the next two years aim to improve detection, reporting, and characterization in ways that are especially critical to environmental and emerging threats.

- **Improve surveillance**

- o Improve surveillance of foodborne, waterborne, airborne, plant, and animal diseases

- 1723 ▪ Build capacity in epidemiology, laboratory testing, informatics, and
- 1724 personnel resources
- 1725 ▪ Standardize best methods and new technologies for multistate
- 1726 foodborne outbreak detection and response
- 1727 ▪ Implement new lines of communication and new approaches for health
- 1728 messaging
- 1729 ○ Improve epidemiologic surveillance related to exposures to environmental and
- 1730 emerging threats, to include high-risk populations and occupations such as
- 1731 emergency responders and health care workers
- 1732 ○ Improve interfaces and approaches to sharing surveillance information about
- 1733 environmental and emerging threats across federal, state, local, and private
- 1734 entities
- 1735 ○ Improve information sharing and systems integration across sectors, including
- 1736 clinical laboratories, health systems, public health epidemiologic
- 1737 investigations, individual providers, veterinary medicine, plant and animal
- 1738 surveillance
- 1739 ○ Conduct antimicrobial resistance surveillance for certain drug-resistant
- 1740 organisms
- 1741 ○ Improve surveillance for environmental and emerging threats (e.g., changes in
- 1742 vector patterns) generated by climate change
- 1743 • **Ensure the capability and capacity to efficiently and accurately conduct**
- 1744 **environmental sampling**
- 1745 ○ Evaluate and improve systems of monitoring outdoor and indoor air with
- 1746 respect to accuracy, resource use, and utility
- 1747 ○ Improve monitoring of water and food
- 1748 • **Monitor long-term health effects**
- 1749 ○ Improve follow-up of those exposed to emerging infections
- 1750 ○ Improve tracking and follow-up of those exposed to environmental toxins
- 1751 ○ Monitor the long-term health effects of climate change with respect to
- 1752 infectious, nutritional, and chronic disease
- 1753

1754 **Improved Ability to Respond and Recover Effectively and Efficiently from Health**

1755 **Incidents Caused by Environmental and Emerging Threats**

1756 The following activities are targeted to improving capabilities for responding to the

1757 environmental and emerging threats addressed by this plan. Many of these activities will also

1758 prove to be of value in confronting a broader range of threats.

- **Improve federal, state, local, and private sector to respond to food-related threats**
 - Coordinate and improve systems for tracing and recalls of tainted products
 - Ensure that consistent and accurate messages regarding contaminated products are disseminated to the public
- **Enhance laboratory support for the management of emerging threats**
 - Improve development and distribution of accurate rapid diagnostic tests for new environmental and emerging threats
 - Improve microbial forensics
 - Create tools for examining and improving “total testing processes” for both environmental and clinical specimens²⁰
- **Increase ability to develop, deploy, and administer medical countermeasures (for both pediatric and adult populations) for newly emerging or reemerging diseases, pandemics, or novel threats**
- **Enhance the legal framework and capabilities related to environmental and emerging threats**
 - Enhance the ability of legal authorities to improve food and water safety, e.g., by issuing regulations aimed at prevention and mandatory recall orders

Conclusion and Future Directions

This NHSS objective discussed in this chapter – ensure prevention or mitigation of environmental and other emerging threats to health – covers a broad range of threats to national health security. It includes threats that are well characterized and others that are less understood or novel; threats due to acts of nature, accidents, and persons acting with malevolent intent; and threats with biological, radiological, nuclear, and chemical origins. Though a great many threats can be considered under this rubric, some – such as food safety and security – can be called out as particular priorities.

The challenge for this first Biennial Implementation Plan is to articulate a set of critical outcomes for the objective and delineate a set of key activities that reasonably can be undertaken during the next two years, given current resource constraints. Recommended activities associated with threats that are already well characterized focus more on operational issues, while those associated with less understood or novel threats tend to be more research-oriented.

²⁰ The total testing process encompasses all components that complete a test from the point of the question asked to the point of action on a result. According to the CDC, it includes three major phases, the preanalytic, analytic, and postanalytic.

1793 The activities described above are, therefore, designed to address those threats that are
1794 considered most immediate to national health security. These include emerging and reemerging
1795 infectious diseases, environmental hazards, and the misuse of life sciences information and
1796 technology. However, many of specified activities could also apply to chemical, radiological,
1797 and nuclear threats. Moreover, subsequent implementation plans might focus on

- 1798 • Identifying and characterizing environmental and emerging threats more fully
- 1799 • Understanding more about their impact on human health
- 1800 • Engaging local, state, tribal, national, business, and international partners in
1801 understanding, preventing and mitigating, detecting and reporting, and responding to
1802 these threats more effectively

1803

PLEASE NOTE: This chapter reflects edits received to date. Given that there are concurrent recovery strategy efforts underway including the National Disaster Recovery Framework and the White House document referenced below, the authors anticipate modifying selected activities in this chapter once those documents are available for review. This will ensure that the content of this objective is appropriately robust for the NHSS BIP, but also complementary, consistent, and not duplicative with other efforts.

OBJECTIVE 8: INCORPORATE POST-INCIDENT HEALTH RECOVERY INTO PLANNING AND RESPONSE

The resumption of normal community activity after the acute phase of an incident has ended is critical to national health security. In the aftermath of an incident, survivors have urgent needs for basic support such as medical care, food, water, safety, and shelter. Post-incident health recovery entails both infrastructure rebuilding and the restoration of pre-incident health status as well as social (or human) recovery. Rebuilding the daily routines and social support networks that contribute to physical and behavioral health and promote the well-being of individuals is essential to ensuring that communities return to normal functioning. Further, the recovery period is not only lengthy but can be complicated by the occurrence of subsequent health incidents. The need for health care and social services continues and evolves as communities recover from an incident over time and ideally return to the pre-incident level for these services.

A robust framework for post-incident recovery must include enhanced capabilities and authorities at the federal, state, and local levels to meet the increased and prolonged needs created by the incident. Effective recovery requires the restoration of services, providers, facilities, and infrastructure within the public health, medical, and human services sectors - in order to return to the pre-incident level of health and well-being of affected people and communities. Strong partnerships with non-profit organizations, businesses, foundations, donors, and government entities are critical to expediting the recovery of this sector.

Challenges remain in integrating lessons learned during the recovery phase into preparedness and response activities. Because planning tends to focus primarily on the response phase, longer-term issues are not identified, much less adequately addressed. Challenges to recovery include difficulties in coordination of the health, behavioral health, and social service sectors in the recovery period. At the same time, transition plans for response-to-recovery and recovery-to-community restoration have not been developed for any sector. The interdependencies between the health and social services sectors along with housing, economic development, environment, and other infrastructure sectors have not been captured in preparedness efforts to date. Consistent with other sectors, the strategy to leverage resources to restore the health and social services sectors has not been adequately planned or staffed at the community, state, or federal level. No recovery preparedness funds are directed to entities in charge of the recovery phase for

the health and social services sectors. Consequently, the recovery preparedness capacity for the health and social services sectors is minimal to non-existent. Particular attention is needed to how existing resources can be leveraged to provide adequate and appropriate health, behavioral health, and social services.

To address these issues, activities over the next two years should focus on building recovery capacity for the health, behavioral health, and social services sectors at the community, state and federal levels. These activities include: 1) provision of medical and behavioral health services through comprehensive health, behavioral health, and social service plans; 2) rebuilding plans that center on robust transition plans for individuals in need of health, behavioral health, and social services; 3) adequate monitoring and evaluation of ongoing recovery; and 4) leveraging of resources to assist individuals in obtaining health, behavioral health, and social services and recovering from an incident.

This strategy encompasses the core principles articulated in the public's feedback to the White House's Disaster Recovery Initiative. The public emphasized the importance of individual empowerment, local leadership, pre-incident planning, inclusiveness and partnerships, communication, timeliness of recovery activities, resilience and sustainability, and unity of effort. By stressing system strengthening, coordination, and leveraging of resources, this objective appropriately complements the White House's Disaster Recovery Initiative while uniquely emphasizing how recovery planning needs to be integrated into broader planning and response activities. Further, activities outlined in this objective should complement current efforts by the White House to develop operational guidance for recovery organizations (e.g., Disaster Recovery Working Group).

The long-term outcomes in the box below correspond to these four critical areas for post-incident health recovery. The outcomes represent endpoints that the activities in this chapter are intended to help address, although the outcomes are not necessarily achievable in two or four years. Rather, the activities in this chapter are the first steps towards achieving each outcome, and can be performed over the next two years.

Long-Term Outcomes for Incorporating Post-Incident Health Recovery into Planning and Response

- Each community will have a plan for health, behavioral health, and social services recovery, which also acknowledges the recovery needs stemming from multiple health incidents
- Health, behavioral health, and social services provided to residents during an incident response will be seamlessly transitioned and coordinated from first responders to the government and non-governmental organizations responsible for recovery and community restoration
- Regular monitoring and evaluation of recovery efforts will take place to ensure that short-

and long-term recovery needs related to health, behavioral health, and social services are met and that lessons learned are incorporated into future recovery plans

- Protocols and plans for leveraging resources will be in place to rapidly assess and finance or support community long-term recovery needs after an incident

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Community Plans for Health, Behavioral Health, and Social Services

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A community's health, behavioral health, and social services needs after an incident depend both on the prior state of its resources and the extent to which the community and its resources were affected by the incident. That is, health, behavioral health, and social services needs—which include support for both health infrastructure capacity and human functioning—are based on local vulnerability and risk attributes. Experience has shown that recovery is more difficult for at-risk individuals and communities that have not taken measures to mitigate pre-disaster vulnerabilities.

1884

1885

The ability to reconstitute health services is critical, either by rebuilding damaged facilities or providing alternate facilities (i.e., temporary structures such as tents) to ensure continuity of care. Health, behavioral health, and social services that bolster individual coping and social reengagement can promote human recovery, particularly for at-risk individuals (also see Objective 1). Such services can be provided by developing agreements and partnerships to provide case management and supporting services, and by training community health, behavioral health, and social service organizations to provide services that can be deployed seamlessly and rapidly after a health incident.

1893

1894

The following activities will be undertaken during the next two years:

1895

- **Establish recovery coordination capacity to reconstitute health, behavioral health, and social services infrastructure at the community, state, and federal level**

1896

1897

- o Allocate resources for recovery preparedness and operational activities, in order to identify assets and facilities that need to be rebuilt, as well as those that may be used as alternates for unavailable or destroyed resources, including private sector or business resources

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1901

- o Preliminary assessments should be conducted for future allocation purposes; these evaluations should be updated as needed in real time to guide dissemination of assets and resources in the aftermath of a health incident

1902

1903

1904

- **Create plans to promote recovery of the affected community members and responders with behavioral health and social services needs**

1905

- 1906 o Create specific plans for promoting the recovery of the affected community
- 1907 members (including at-risk individuals) and responders with behavioral health
- 1908 and social services needs
- 1909 o Develop plans for identifying, engaging, and training local personnel to provide
- 1910 basic supportive interventions, such as psychological first aid and related models;
- 1911 models should be culturally and developmentally appropriate
- 1912 • **Develop partnerships and memoranda of understanding (MOUs) with local**
- 1913 **government agencies and NGOs**
- 1914 o Identify or create specific plans for how community health services and social
- 1915 institutions will be involved in recovery decision-making (such as return of
- 1916 community members to the area), and provide case management and associated
- 1917 health, behavioral health, and social services
- 1918 o Partnership agreements will establish the partnership, planning, and expectations,
- 1919 as well as how to properly coordinate and sequence distribution; local
- 1920 governments will use these partnerships to identify local vulnerabilities that can
- 1921 be addressed using case management services
- 1922 o Develop plans to engage established organizations (e.g., Neighborhood Watch);
- 1923 cultural, civic, and faith-based groups; child care facilities and schools; as well as
- 1924 local residents, primary care health workers, teachers, religious leaders, and
- 1925 community leaders; to alert individuals to the availability of post-incident services
- 1926 at community institutions, including informal gathering places (e.g., beauty
- 1927 parlors, cafes, day care centers)
- 1928

1929 **Seamless Transition and Coordination in the Acute and Long-Term Post-Incident**

1930 **Phases**

1931 Traditional emergency planning has focused on the steps needed to prepare for and respond to an

1932 incident, but has not clearly articulated the time points or ‘triggers’ for transition from response

1933 to recovery, roles and responsibilities during transition, or the operational processes needed to

1934 ensure a smooth and efficient transition. Appropriate recovery planning will help to mitigate

1935 delays in reconstruction and unmet physical and behavioral health needs that can compound into

1936 serious issues when unattended.

1937

1938 To help inform planning, a universal guideline or timetable is needed that outlines when and how

1939 local government and NGOs should assume roles and responsibilities for providing citizen

1940 services, particularly when federal, state, or regional government presence necessarily recedes.

1941

1942 The following activities will be undertaken during the next two years:

- 1943 • **Incorporate transition-to-recovery planning into federal, state, and local emergency**
- 1944 **plans and include government and non-governmental partners (including health,**

behavioral health and social service organizations) as part of incident planning groups. A coordinated plan for transition to recovery will ensure continuity of health, behavioral health, and social services by identifying the following:

- o Appropriate resources needed to address both physical and behavioral health as well as specific needs of at-risk individuals, and the ways in which existing resources will be leveraged to maximize state, territorial, and tribal government assets (for distribution to local government) in the short and long terms
- o The ways in which at-risk individuals will be involved in planning
- o Priorities for health infrastructure relocation and replacement
- o Assistance for citizens who become displaced and need to return to their communities
- o Processes to monitor compounding health-related health incident consequences in areas impacted by multiple incidents, rapid health assessment and planning processes to be used during the incident response phase to address unanticipated issues
- o Recovery strategies that promote long-term health, behavioral health, and social recovery and community development

NOTE: Please note that we will modify this bullet once final language is available from the NDRF. This will ensure that this activity remains but is appropriately complementary.

- **Establish guidance on roles and responsibilities among federal, state, and local government as well as non-governmental partners to ensure continuity of health and social services**
 - o Plan on how to maintain continuity of care for health, behavioral health, and social services
 - o Develop protocols to facilitate the transition between response and recovery operations
 - o Develop guidelines on managing response and recovery missions, given type and nature of the health incident

Regular Monitoring and Evaluation of Recovery Efforts and Incorporation of Lessons Learned

As the Nation works to strengthen recovery plans, a robust effort is needed to integrate lessons learned into preparedness and response activities. To improve accountability and the quality of recovery efforts, data elements should assess recovery progress, quality of recovery efforts, and outcomes of recovery efforts. Building these common data elements into recovery planning will improve decision-making at local, state, territorial, tribal, and national levels by increasing access to vital information.

- 1985 The following activities will be undertaken during the next two years:
- 1986 • **Ensure that all disaster plans have identified common data elements (e.g.,**
 - 1987 **benchmarks for disaster operations, relevant data from response) to facilitate**
 - 1988 **seamless monitoring and evaluation of health, behavioral health, and social services**
 - 1989 **pre-, during, and post-incident, and begin developing tools to support state and local**
 - 1990 **recovery planning groups' integration of these elements into their disaster plans**
 - 1991 ○ Define the common core elements of health, behavioral health, and social
 - 1992 recovery and key data elements that should be included in all community disaster
 - 1993 plans
 - 1994 ○ Build tools to help state and local recovery groups integrate these indicators into
 - 1995 their disaster plans
 - 1996 • **Build the capacity of local communities to better utilize existing data on health,**
 - 1997 **behavioral health, and social services from FEMA and other state and local sources**
 - 1998 ○ Assess federal databases to identify additional data that needs to be linked to the
 - 1999 National Emergency Management Information System (NEMIS)
 - 2000 ○ Create plans to link shared data from recovery assessments, services provided
 - 2001 during the response phase (e.g., to NEMIS), and recovery outcomes (e.g., the
 - 2002 data linked with recovery plans)
 - 2003 • **Develop a centralized and accessible system to aggregate the recovery-related**
 - 2004 **lessons learned from local communities (e.g., after action reports) and disseminate**
 - 2005 **these lessons to communities with accompanying tools/supports and incentives to**
 - 2006 **use them**

2007

2008 **Financing Protocols Are in Place to Leverage Resources for Post-Incident Health**

2009 **Recovery Needs**

2010 One of the critical barriers to ensuring a coordinated recovery plan is the lack of a framework to

2011 leverage resources for recovery. The coordination of recovery for the health, behavioral health,

2012 and social services sectors is necessary. It may include pre-established contracts and/or

2013 memoranda of understanding for services to transition from response to recovery. Established

2014 contracts could encourage a more efficient, timely, and coordinated local response. An

2015 assessment of which organizations will be reliable in response is needed as well, though criteria

2016 should be developed for this analysis. In addition, in light of economic stressors and limited

2017 resources, guidance on how to leverage existing assets is needed.

2018

2019 The following activities will be undertaken during the next two years:

- 2020 • **Review current policies and protocols for financing long-term recovery (i.e.,**
- 2021 **disbursing, length of financing, transition point when local government/private**
- 2022 **sector starts providing more of the recovery financing)**

- 2023 o Conduct an initial critical review of current recovery funding policies
- 2024 o Develop a transition plan for streamlined disbursement of funds and transition
- 2025 roles for long-term recovery, particularly to ensure seamless transition between
- 2026 acute incident response periods, longer-term recovery, and return to routine
- 2027 community functioning
- 2028 • **Identify mechanisms to expedite disaster recovery funding and ways to**
- 2029 **appropriately leverage existing resources**
- 2030 o Consider opportunities for leveraging assets that have “dual use” in recovery
- 2031 • **Develop plans to assess community needs for resource allocation at the onset of an**
- 2032 **incident to activate funding plans quickly**
- 2033 o Create local government and NGO partnerships (or build on existing partnerships)
- 2034 to identify processes for designating “response reliable” agencies that address the
- 2035 needs of the population, including at-risk individuals
- 2036 o Develop the initial draft of a pre-established contract that can be used by federal
- 2037 and state agencies with health, behavioral health, and social service providers

2038

2039

Conclusions and Future Directions

2040 This chapter identifies four long-term desired outcomes as well as activities to begin to address
 2041 these outcomes in the next two years. Ongoing efforts will be needed in future years to attain
 2042 these outcomes.

2043

2044 Of these outcomes, it is first critical to ensure that there is a strong capacity for health, behavioral
 2045 health, and social services in the recovery period. Once this capacity is created, then recovery
 2046 plans need to be developed and integrated into preparedness and response activities. In order to
 2047 reduce the time for community recovery, health, behavioral health, and social service provision
 2048 must be coordinated among governmental and non-governmental actors and must identify ways
 2049 to leverage resources to expedite response and recovery.

2050

2051 Once these efforts are underway in the areas of recovery system strengthening, coordination,
 2052 leveraging resources, it is important to implement a strong corrective action plan capability to
 2053 prioritize activities for future investment. The following activities are key to supporting post-
 2054 incident health recovery, including social re-engagement:

- 2055 • Sponsor and disseminate research on the best or promising practices for coordination
- 2056 between response and recovery, with attention to best practices for the return of families
- 2057 to their original communities following a large-scale evacuation
- 2058 • Build and/or strengthen data-sharing mechanisms (centralized, coordinated) for service
- 2059 transition from response to recovery

- 2060 • Advocate adequate funding to NGOs to develop ongoing, local processes for improving
2061 community resilience to offset long-term recovery needs
- 2062 • Identify how advanced technologies – in particular, communication networks (e.g., web
2063 portals, robust cell towers, GPS) – can provide cost-effective methods of promoting
2064 social connectedness and a sense of safety. These technologies can quickly reconnect
2065 families and other social groups. Re-engaging social networks after a health incident,
2066 such as by reuniting families or communities, may promote psychological recovery by
2067 providing emotional security and stability
 - 2068 ○ Research should also focus on existing community social networks to identify
2069 how they may contribute to long-term psychological recovery
- 2070
- 2071

**OBJECTIVE 9: WORK WITH CROSS-BORDER AND GLOBAL PARTNERS TO
ENHANCE NATIONAL, CONTINENTAL, AND GLOBAL HEALTH SECURITY**

Global health security is achieved when individual countries actively engage in collaborative efforts to mitigate the spread and effects of transmissible diseases, natural disasters and other health incidents on morbidity and mortality. Individual countries and the global community as a whole must be prepared to prevent, protect against, respond to, and recover from any type of large-scale incident with the potential for negative health consequences. Achieving the vision of global health security is dependent on the collective capability of many countries to assess vulnerabilities, prepare for, respond to, and recover from a broad range of incidents in a timely, effective and coordinated manner, facilitated through a global infrastructure with the capacity to support these efforts. This chapter lays out desired outcomes for the next four years, consistent with the NHSS, and activities over the next two years toward achieving those outcomes.

The national health security of the United States is dependent on and related to the health security of other nations. Infectious diseases flow freely across borders and around the globe through air, land, and sea transport, all of which provide points of entry into the United States. Chemical, biological, radiological, and nuclear (CBRN) materials also pose a risk to global health security, whether arising as a result of natural phenomena or because they have been released accidentally or deliberately in the pursuit of war, terrorism, or crime. Similarly, natural catastrophes, such as the early 2010 earthquakes in Haiti, China, and Chile, have highlighted the importance of cooperative international response, since not infrequently countries require or request assistance from United Nations agencies and/or bilateral partners (such as the United States), to respond to such incidents. Additional vulnerability results from the fact that much of the world's manufacturing and supply-chain infrastructure for the medicines needed to respond to health incidents is spread across multiple countries, and a similar situation pertains to food, which is imported and exported extensively across national borders around the globe.

The World Health Organization's (WHO) revised International Health Regulations (IHR) provide a strong basis for achieving global health security by aiming "to prevent, protect against, control and provide a public health response to the international spread of disease" while minimizing interference with trade. The IHR call for countries to build their core public health capacities, work through regional networks, and provide technical assistance to other countries.

The United States must work internally and with international partners to support and strengthen existing international structures to prevent, protect against, respond to, and recover from health security threats and incidents, through effective cooperation and capacity building. U.S. efforts must be appropriately aligned with those of other stakeholders that provide resources, implementation support, and technical guidance for national and global health security capacity. The broad base of stakeholders also means that there is a need to enhance coordination across U.S. Government (USG) agencies and also with domestic non-USG and international organizations.

Given this need for improved coordination and capacity building, the overall aim of this objective is to enable the United States to work towards the overarching goal of enhancing national, continental, and global health security by focusing on realistic, achievable actions over the next two years that will help out Nation attain the two long-term outcomes.

Long-Term Outcomes for National, Continental, and Global Health Security

- U.S. collaboration and diplomatic engagement with key domestic and international stakeholders are strong and well coordinated
- The United States and other countries and partners have strengthened their capacities for cross-border and broader international health security

Global engagement allows the United States to harness the shared values of human health and health security around the world and to uphold the U.S. commitment to human dignity, respect for universal values, support to areas of mutual interest, and investment in the capacity of strong and capable partners, as espoused in the National Security Strategy.²¹ International collaboration requires active efforts on the part of the USG and its domestic and international partners. This cooperation should have a strong foundation in health diplomacy, sharing of technical knowledge and lessons learned, and capacity building.

Health Security Collaborations and Diplomatic Engagement

Achieving health security at the national and continental levels means that the USG must work effectively with communities and partners on both sides of the U.S. borders with Canada and Mexico. This will require the assessment and implementation of optimal collaboration mechanisms to foster cross-border relationships of mutual trust as well as effective collaborations within the United States, from local to national levels and vice versa. U.S. engagement with the broader international community through intergovernmental and other multilateral organizations and initiatives promotes dialogue and cooperation on areas of common interest, such as advancing global health security goals. The U.S. must also work directly with individual countries and regional networks to promote cooperative and collaborative approaches for addressing health security issues.

The following activities will be undertaken during the next two years:

- **Foster effective cross-border engagement with Canada and Mexico by building new activities upon existing structures.** Such an approach will leverage, and eliminate

²¹ The White House, *National Security Strategy* (May 2010) (accessed online 6/30/10 at http://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf).

2144 barriers to, ongoing efforts with partners on both sides of the U.S. borders with Canada
2145 and Mexico as stakeholders seek to cooperate in a transparent, effective and sustainable
2146 manner. Specific activities will be to:

- 2147 o Establish a USG-wide forum for the departments and agencies working on health
2148 security to assess their current national and international health security efforts, future
2149 needs, and potential collaborations, while building on existing bilateral, trilateral and
2150 regional cooperation
- 2151 o Engage with U.S. border states, localities, and tribes as well as professional public
2152 health and medical organizations to assess border-related health security issues and
2153 develop a strategy to address current gaps and needs. Examples of strong cross-
2154 border collaborations activities in which U.S. northern border and southern border
2155 jurisdictions/communities should be engaging with their neighboring Canadian and
2156 Mexicans counterparts include but are not limited to:
 - 2157 ▪ Collaboratively assisting one another in incident preparedness and response, border
2158 health security, laboratory testing, diagnosis and treatment, epidemiological
2159 investigation, and the control of infectious diseases and other health threats
 - 2160 ▪ Collaborating in incident preparedness and providing response assistance for
2161 pandemic influenza and other emerging pandemic threats
 - 2162 ▪ Coordinating the planning for and implementation of mutual assistance among
2163 participating partners in public health capacity-building and capabilities-
2164 enhancement against bioterrorism and all-hazards threats
- 2165 o Explore the best way for the USG and non-governmental organizations (NGOs) to
2166 collaborate efficiently in time of crisis so as to take best advantage of their diverse
2167 capabilities by sponsoring a meeting with key stakeholders on both sides of the U.S.
2168 borders with Canada and Mexico and with international nongovernmental organizations
2169 (NGOs)

2170 • **Promote multilateral and multinational engagement**

- 2171 o Strengthen USG relationships with headquarters and regional offices of the WHO, the
2172 World Bank, the UN Children's Fund (UNICEF), UN High Commissioner for
2173 Refugees (UNHCR), UN Office for Coordination of Humanitarian Assistance
2174 (UNOCHA), and other relevant agencies within the United Nations system
- 2175 o Support USG commitments under treaties relevant to global health security (e.g.,
2176 IHR, the Convention on the Prohibition of the Development, Production and
2177 Stockpiling of Bacteriological [Biological] and Toxin Weapons and on Their
2178 Destruction," - usually referred to simply as the 'BWC'- and other international
2179 initiatives including but not limited to the Millennium Development Goals)
- 2180 o Likewise, USG initiatives to advance broader public health goals in the international
2181 stage (e.g., President's Emergency Fund for AIDS Relief [PEPFAR], President's

- 2182 Malaria Initiative [PMI], Global Health Initiative [GHI]) could serve as catalysts to
2183 advance global health security)
- 2184 o Foster diplomatic and technical collaborations with like-minded countries through the
2185 Global Health Security Initiative (GHSI), and support the development of a three-year
2186 strategic plan to advance health security matters of common interest
 - 2187 o Increase collaboration with Canada and Mexico within the North American Leaders
2188 Summit Framework and develop an action plan to enhance health security in the
2189 region, including an updating of the North American Plan for Avian and Pandemic
2190 Influenza (NAPAPI)
 - 2191 o Develop diplomatic links and technical collaborations with regional organizations
2192 throughout the world which have an interest in advancing a health security agenda
 - 2193 ■ These may include, but are not limited to, the Ministers of Health of the
2194 Organization of Islamic Countries, the Union of South American Nations, Council
2195 of Ministers of Health of Central America and Dominican Republic, the African
2196 Union of Ministers of Health, and the Asia Pacific Economic Cooperation forum
 - 2197 o Continue to work to reinvigorate cooperative international bio-engagement programs
2198 to reduce threats such as the BWC
 - 2199 o G8 Global Partnership *[HHS agencies and interagency partners to more fully*
2200 *describe proposed activity with/through G8]*
- 2201 • **Enhance strategic bilateral engagement**
- 2202 o Facilitate the creation and maintenance of a global inventory of current and potential
2203 countries, regional networks, and key public health organizations within countries
2204 with which the United States should continue or initiate technical and diplomatic
2205 alliances to foster health security; based on this, develop a plan for new or
2206 strengthened engagement with strategic partners
 - 2207 o Strengthen diplomatic relations and collaboration with key partners by participating
2208 in and hosting meetings with select Ministries of Health and other ministries as
2209 appropriate, to assist in establishing technical cooperation to prevent, protect against,
2210 respond to, and recover from health incidents
 - 2211 o Support the bilateral health security programs on research, development, and
2212 capacity-building as a means to establish links with Ministries of Health and
2213 international scientific and public health organizations to strengthen the U.S. and
2214 global capacity to respond to health incidents of international concern

2216 **Health Security Capacity Building**

2217 U.S. cross-border and broader global health security relies on the ability to carry out surveillance
2218 and monitoring of communicable diseases and environmental threats to public health and the
2219 capability to manage health security threats based on adequate national capacities and on solid

international and inter-sectoral (i.e., human health, animal and plant health), collaborations. Recent international health incidents such as the 2009 H1N1 influenza pandemic and several other large incidents in various regions of the world have underscored the need for effective national and international systems and programs to contain and respond to rapidly spreading disease. Likewise, the USG needs to assess its internal operational capacity to respond promptly to unexpected natural and manmade incidents that require international cooperation and effective government coordination and response. As noted in the National Security Strategy (White House, 2010), the United States needs to enhance not only its own capacity to respond to health security threats, but also its ability to work with other countries and international organizations to develop and/or harmonize plans and response programs by strengthening institutional and human capacity.

The following activities will be undertaken during the next two years:

- **Continue to support the development of early warning surveillance and situational awareness reporting infrastructure.** As countries strive to ensure the core public health capacities specified in the IHR, U.S. technical assistance should include support to help them create policies and systems for public health laboratory management and the systematic flow of specimens and automated information between local and national levels. A single global situational awareness system is not achievable in the short term and may or may not even be desirable in the longer term. However, some near-term steps may advance the process: local and cross-border cooperation with federal coordination and leadership, and a U.S. focus on supporting networks and a network of networks, both of which will help build systems from the bottom up (local, cross-border, regional cooperation) based on trust and cooperation and the mutual benefit of all stakeholders. Specific activities will be to:
 - Continue supporting the development of early warning infectious disease surveillance capacities along both sides of the U.S. borders with Canada and Mexico, prioritizing laboratory-supported cross-border surveillance, detection, epidemiological investigation, health alert communications, and outbreak management and control. Such capacity development should add value to and synergize with ongoing international epidemiologic and laboratory capacity-building of federal agencies
 - Strengthen situational awareness and early-warning reporting infrastructure across a broader range of developing countries, including technical support to develop and/or strengthen national IHR core capacities and to develop and implement standardized procedures and practices for incident communications
 - For countries unlikely to meet national core capacity requirements by the IHR target date, the U.S. should consider regional or sub-regional approaches to capacity building, i.e., building collective core capacities within a cluster of cooperating countries (e.g., promoting the use of bilateral or regional agreements for coordinated surveillance and response that complement the IHR)

- 2260 o Continue to provide technical support for capacity-building within existing USG and

2261 non-USG networks and partnerships for laboratory-supported surveillance and control

2262 of human, animal, and plant diseases with a focus on physical facilities and layout;

2263 biosafety and biosecurity capabilities; availability, quality assurance, and mastering

2264 of laboratory equipment, techniques, and processes; accessibility to reagents/supplies;

2265 and safe collection, transport, and transference of samples and specimens
- 2266 o Continue to support collaboration between the human and animal health sectors to 1)

2267 improve zoonotic disease surveillance and response, including technical support to

2268 laboratory networks for detection capacity, confirmatory testing, and communication

2269 of positive findings and information dissemination for prompt notification and

2270 decision-making capability, and to 2) develop new policies and strategies to mitigate

2271 the unwarranted use of antimicrobial drugs
- 2272 • **Enhance public health security in travel and transport.** As specified in the IHR, all

2273 countries must develop, strengthen, and maintain core public health capacities for use on

2274 both a routine and emergency basis to reduce the risk of disease spread and to allow the

2275 effective and rapid implementation of public health measures in response to an incident.

2276 U.S. activities for IHR-related capacity in the areas of travel and transport will be to:

 - 2277 o Support WHO coordinating activities for a global network for ports, airports, and

2278 ground crossings for rapid information exchange and coordinated response
 - 2279 o Develop a model for a global forum for international aviation and maritime travel

2280 industry associations, governments, and WHO for shared protocols for illness

2281 detection, notification, and response
 - 2282 o Assist other countries in exploring options for collaboration between border

2283 protection and public health agencies to identify and prevent ill travelers from

2284 traveling
 - 2285 o Continue to provide technical assistance to WHO and its member states for

2286 implementation of IHR core capacities at ports, airports, and ground crossings

 - 2287 ▪ Continue working with WHO to raise awareness of disease risks associated with

2288 global migration
- 2289 • **Develop USG international response plans.** The United States should work in

2290 conjunction with international partner organizations and other countries to strengthen

2291 current plans or develop new ones for international response to health incidents wherever

2292 and however they may arise. Specific activities will be to:

 - 2293 o Develop and exercise a U.S. Government Framework for International Response to

2294 Pandemic Influenza, to include lessons learned from the 2009 H1N1 response
 - 2295 o Develop and implement the Policy and Operational Framework to Share Medical

2296 Countermeasures for chemical, radiological and nuclear, and biological threats,

2297 including pandemic influenza, and facilitate broader sharing of assets (beyond those

- 2298 medical countermeasures inherent to the U.S. Strategic National Stockpile) across
2299 countries during health incidents
- 2300 o Assess U.S. national-level and state-level capacities to meet the core capacity
2301 requirements to implement the IHR, both to address an international obligation for the
2302 United States, and to enhance domestic public health capacities to detect, assess,
2303 communicate about, and respond to health incidents
- 2304 o Assess USG activities that support IHR implementation internationally, and
2305 collaborate with relevant international partners, including the WHO and its Regional
2306 Offices, to identify areas of need for assistance to developing countries and regional
2307 networks to implement IHR
- 2308 • **Strengthen health systems to respond to health security incidents.** It is necessary for
2309 individual countries to strengthen their health systems to be able to scale up capacity
2310 when needed and to create dedicated incident-response systems as warranted. Specific
2311 activities to assist countries will be to:
- 2312 o Promote learning and sharing of information about international efforts by
2313 participating in and organizing conferences, workshops, planning and policy
2314 discussion meetings, and exercises to advance health security
- 2315 o Present to and discuss with partners:
- 2316 ▪ Existing frameworks for international assistance
- 2317 ▪ Initiating international assistance protocol development
- 2318 ▪ Potential forums that facilitate collaborative achievement of response capabilities
- 2319 ▪ Financial considerations for achieving global health security
- 2320 o Support technical coordination with WHO regional and global Collaborating Centers
2321 and networks related to health security, including but not limited to, the Global
2322 Outbreak Alert and Response Network (GOARN) for infectious diseases and the
2323 International Program in Chemical Safety (IPCS) for toxic industrial compounds and
2324 other chemicals of major public health concern
- 2325 ▪ In addition, supporting the WHO's Radiation Emergency Medical Preparedness
2326 and Assistance Network (REMPAN) is vital for early notification and assistance
2327 in diagnosis, monitoring, dosimetry, treatment, and long-term follow-up of
2328 radiation injuries, acute radiation syndrome, internal contamination, and other
2329 radio-pathology. Another key organization with which to collaborate with will be
2330 the International Atomic Energy Agency (IAEA), and its Response Assistance
2331 Network (RANET)
- 2332 o Explore the creation of an "international public health service corps" designed to
2333 complement existing USG international health programs and technical assistance by
2334 providing surge capacity to respond to international health incidents and training of
2335 nationals in the countries where they are located

- o Promote discussions within multilateral bodies and international organizations about the need to harmonize logistics and legal frameworks to provide international assistance during health incidents
 - o Collaborate with the WHO and other organizations to support developing countries in the creation or strengthening of manufacturing capacity for medical countermeasures (e.g., manufacturing platforms for vaccines for seasonal and pandemic influenza)
 - o Provide ongoing training targeted for the workforce of vaccine manufacturers, supported by the Biomedical Advanced Research and Development Authority (BARDA) capacity-building program, to position manufacturers to independently produce quality vaccines independently and to provide hands-on practical experience for current and prospective staff
- **Enhance laboratory biosafety and biosecurity practices**
 - o Continue to support national and international efforts to manage infectious materials safely within the laboratory, in an effort to reduce or eliminate exposure to potentially infectious substances (biosafety), and to protect against loss, theft, diversion, or intentional misuse of microbiological pathogens (biosecurity)
 - o Continue to work with WHO and national and regional partners to promote the development of guidance on best practices and safe transport of infectious substances; conduct international trainings, assessments, and site visits; and sponsor international biosafety symposia.
- **Improve food security and food, drug and product safety;** new efforts to enhance food and drug safety should build upon current efforts
 - o Increase the capacity of other countries to regulate food, drugs and products, focusing on improving surveillance and regulation at source
- **Collect and disseminate lessons learned and conduct relevant research**
 - o Develop and institutionalize a process for learning from the experiences and incorporating lessons observed from health incidents in other countries into the U.S. policy dialogue, adapting existing or creating new mechanisms to facilitate this process. Such information should be made available to both U.S. and non-U.S. partners
 - Lessons should include not only positive but also negative experiences, e.g., breakdowns in food safety, biosecurity and biosafety, including examination of how problems were or could have been prevented and what responses should be replicated or avoided in the future
 - o Promote sharing of experiences and lessons through relevant existing networks, structures and venues

- **Promote human capital development in the traditional classroom or meeting room setting and/or through novel information dissemination and knowledge management technologies in the virtual environment.** Specific activities will be to:
 - Explore partnerships between the federal government and its non-governmental partners, particularly in educational institutions, by taking steps to integrate health diplomacy and security into U.S. curricula for public health and international relations
 - Support forums in which health and foreign affairs scholars can identify research priorities to expand the evidence base related to health diplomacy and health security
 - Facilitate the development of physical regional health care training centers (e.g., the Regional Health-Care Training Center [RHCTC], at the Gorgas Memorial Institute of Health Studies in Panama), and/or other technological training and education forums to train medical clinicians and other public health and biomedical professionals
 - Expand the CDC's Field Epidemiology and Laboratory Training Program (FELTP) model to more countries with training for laboratory technicians to improve laboratory diagnostic capability and integration with epidemiologic functions
 - Promote and enable the exchange of U.S. and foreign epidemiologists, laboratory staff, information technologists and policymakers to participate in on-the-job training for extended periods (e.g., 1-2 years) at leading academic institutions, and public health and medical organizations in the U.S. and abroad
 - Actively participate in or collaboratively sponsor conferences, scientific symposia, planning and policy discussion meetings, and other interactive forums to advance health security with counterpart scientists, public health officials, policymakers, and other key stakeholders within and beyond the health sector

Conclusions and Future Directions

Global events and global health security capacity are key elements of U.S. national health security as well as the health security of other countries. This chapter specifies a number of activities to be carried out over the next two years to strengthen cooperation and capacity building within and beyond U.S. borders and thereby to enhance national, continental and global health security. It describes USG activities at cross-border, multilateral/multinational, and bilateral levels. Capacity building activities support the WHO IHR, addressing such areas as surveillance; travel/transport; laboratory biosafety/biosecurity; food, drug and product safety; and the human resources and health system infrastructure underlying these. The chapter also describes a dynamic process for learning from previous experiences as well as activities to strengthen the USG's own international response plans. While these activities are ambitious, they build upon a solid platform of existing relationships, mechanisms and programming. Achievement of the two desired outcomes and this NHSS objective is realistic and carries the promise of sustainable national and global health security.

OBJECTIVE 10: ENSURE THAT ALL SYSTEMS THAT SUPPORT NATIONAL HEALTH SECURITY ARE BASED UPON THE BEST AVAILABLE SCIENCE, EVALUATION, AND QUALITY IMPROVEMENT METHODS

Earlier chapters identified knowledge gaps relating to specific NHSS objectives. This chapter makes the filling of these knowledge gaps a priority in its own right. Specifically, the objective seeks to ensure that all systems that support national health security are informed by the best available science, evaluation, and quality improvement methods. Fully realizing the objective will require a multi-year undertaking that evolves to reflect advances in knowledge and scientific methods for understanding and improving national health security.

Meeting this objective will require achievement of five long-term outcomes, which apply to all 50 capabilities identified in the NHSS.

Long-Term Outcomes for Ensuring that All Systems Supporting National Health Security Are Based on the Best Available Science, Evaluation, and Quality Improvement Methods

- Efforts to improve science, evaluation, and quality improvement are developed through meaningful interagency, inter-sector collaborations
- National health security is informed by a science base and supported by a coordinated agenda research and evaluation
- National health security can be measured, evaluated, studied, and improved via a coordinated set of performance measures and standards
- Coordinated, user-friendly information about national health security is reported to key stakeholders
- Key stakeholders have tools to continuously improve national health security

Interagency, Inter-sector Collaboration on Science, Evaluation, and Improvement

As with other aspects of health security, advancing science, evaluation, and quality improvement will require the involvement of a wide range of governmental and non-governmental actors. Thus, progress in meeting this objective will be characterized by regular and meaningful collaboration/coordination/consultation among federal, state, local, and non-governmental entities.

During the next two years, the following implementation activity will help ensure such coordination:

- **Develop and formalize a Research and Evaluation Collaborative**
 - This will include developing a charter for and initiating a research and evaluation collaborative; the collaborative will serve as a venue in which participating

2439 federal agencies can voluntarily work out coordinated approaches for carrying out
2440 the activities detailed later in this chapter

- 2441 o Membership will include, but is not limited to: federal departments and agencies
2442 that support research affecting national health security. Members will seek
2443 information from national professional and stakeholder organizations; academic
2444 institutions and research organizations; nonprofits; private businesses; and other
2445 stakeholders

2446

2447 **Coordinated Research and Evaluation Agenda to Inform National Health Security**

2448 Wherever possible, evidence from research and evaluation studies should drive identification of
2449 best practices and development of guidance, standards, and performance measures. A range of
2450 federal and nonfederal organizations are already investing in research and evaluation on national
2451 health security. Yet, research is often conducted in disciplinary silos and does not adequately
2452 reflect the multidisciplinary perspective of practitioners. Development of a first-generation
2453 interagency research agenda will help ensure that critical knowledge gaps are not missed, and
2454 that synergies across research projects are effectively leveraged.

2455

2456 The following activities, to be coordinated by the Research and Evaluation Collaborative during
2457 the next two years, will help develop the agenda:

2458

- 2459 • **Develop, disseminate, and update syntheses of existing governmental and non-**
2460 **governmental research and evaluation efforts**

- 2461 o This will provide a detailed picture of current research/evaluation investments and
2462 gaps, which will provide a useful foundation for developing an integrated federal
2463 research agenda; the scope of the inventory may need to be limited at first, but
2464 may expand in future years

- 2465 • **Develop and disseminate a coordinated research and evaluation agenda**

- 2466 o Based in part on the synthesis of existing research/evaluation, HHS/ASPR will
2467 work with its partners in CDC, VHA, DHS, and DoD to develop a joint research
2468 and evaluation agenda that defines what topics, issues and problems should be
2469 addressed

- 2470 o The agenda can be disseminated to all relevant federal government funders and
2471 government and non-governmental stakeholders to guide investment decisions
2472 and will evolve over time to reflect changes in knowledge and priorities

- 2473 • **Develop and disseminate standards of proof for evidence-based practices**

- 2474 o As noted elsewhere, there is need to identify and disseminate best practices in
2475 national health security; thus, it will also be necessary to establish consensus

moving forward about what will count as adequate evidence for “evidence-based practices” in the field

- o Key stakeholders will be convened to develop appropriate standards of proof for “evidence-based practice” in national health security

Coordinated Set of Performance Measures and Standards to Measure, Evaluate, Study, and Improve National Health Security

Developing accurate and feasible performance measures is critical to supporting research, evaluation, reporting, and quality improvement activities. This effort will build upon existing efforts, including (but not limited to) measures developed by HHS/CDC for the Public Health Emergency Preparedness Cooperative Agreement, HHS/ASPR’s Hospital Preparedness Program, and others. The goal is not to build a separate national health security measurement system, but to bring greater harmony and coordination to measures developed for specific programs.

The following activities, to be completed during the next two years and coordinated by the Research and Evaluation Collaborative, will help realize this outcome:

- **Develop consensus among key partners around a common methodological framework to guide measure and standards development;** the framework will provide guidance both on how developers should select *what* to measure/develop and on *how* they should collect measurement data
 - o HHS/ASPR is currently circulating a draft framework that draws upon the approach used by CDC to develop performance measures for the PHEP Cooperative Agreement; HHS/ASPR will solicit feedback on the draft framework from key partners and stakeholders and work collaboratively with them to develop a common approach
- **Develop and begin executing a work plan for a common core of health security measures and standards**
 - o Initially, performance in meeting the NHSS’s goals and objectives will be assessed using the performance measures developed for the CDC’s PHEP Cooperative Agreement Guidance; in addition, HHS/ASPR has developed a set of additional candidate measures, which will be vetted according to the methodological framework described in the preceding activity
 - o HHS/ASPR will also work with key federal and nonfederal partners to develop a common national work plan for measure development:
 - The plan will identify which measures and standards should be developed, data sources, and approaches to archiving and sharing data

- The plan will provide a long-term vision for a fully elaborated set of measures, but will also clearly identify a critical set of measures to be developed during the next two years

Coordinated Reporting of Health Security Performance Information to Stakeholders

National health security is the joint responsibility of a broad range of actors, including individuals, families, and businesses. Thus, it is important that all of these actors have access to rigorous, timely, and user-friendly information on health security performance and on the impact of investments in improving health security.

The following activities, to be completed during the next two years and coordinated by the Research and Evaluation Collaborative, will help realize this outcome:

- **Produce regular, integrated public reports on national health security**
 - Development of this report will be guided by consideration of the informational requirements of end users, including but not limited to Congress and the White House, state and local governmental partners, nonprofit and private sector partners, and the public at large; where possible and appropriate, the report will draw upon existing reports, analyses, and data sources

Availability of Tools for Continuous Quality Improvement

Performance measures and standards can identify gaps in health security, but by themselves they cannot close those gaps. Quality improvement (QI) tools and other similar technical assistance tools offer a means of identifying and closing performance gaps by understanding and measuring performance, identifying solutions to performance shortfalls, and implementing changes to improve outcomes. Such tools are currently used quite broadly in clinical health care settings and to a lesser extent in public health and other settings. Greater use of these tools in national health security can provide a systematic and effective approach to improving the ability to prevent, mitigate, respond to, and recover from incidents.

The following activities, to be completed during the next two years and coordinated by the Research and Evaluation Collaborative, will help realize this outcome:

- **Review existing QI programs and tools/techniques and, if needed, identify and support development of new tools;** extant health security tools that incorporate QI and have demonstrated success will be identified
- **Disseminate and incorporate QI training and tools into grant guidance, accreditation, and education/training programs**

- 0 Where consistent with relevant statutes and regulations, encourage all agencies and other entities funding health security to require grantees to demonstrate the use of QI processes or tools as a condition of funding
- 0 Convene accreditation and professional associations to identify opportunities to embed QI principles and tools into their grant and accreditation programs and to encourage these organizations to develop recognition programs to highlight exemplary QI practices in health security

Conclusions and Future Directions

This chapter describes specific implementation activities that will help ensure that the nation has in place some basic systems for developing the national health security science base, tracking and reporting on performance, and using quality improvement methods to close gaps. However, it is important to keep in mind that advancing science, evaluation, and quality improvement for national health security will required sustained effort beyond the next two years, including (but not limited to):

- Continuing efforts to update performance measures, standards, and improvement strategies based on advances in scientific knowledge
- Development of new sources of scientific evidence, such as computer simulations and structured knowledge-capture systems for exercises and real incidents/events
- Continuing efforts to use and integrate performance data sources maintained by public, nonprofit and private sector entities

CONCLUSION

This Plan is not the end, but the starting point for improving our Nation's ability to prevent, protect from, respond to, and recover from a pandemic influenza or other infectious disease outbreak; a wide range of natural disasters, including hurricanes, tornadoes, earthquakes and floods; a bioterrorist attack; or a chemical or radiological incident. Over time, the specific set of outcomes and activities, as well as elements of the NHSS itself, may be refined. But it is important to ensure that we continue to make progress now. The responses to H1N1 and the Gulf oil spill illustrate both the challenges and the progress that our Nation has made towards achieving health security goals and objectives. The response to the H1N1 outbreak, in particular, demonstrated that important progress has been with respect to the Nation's ability to detect an emerging threat and respond accordingly. It has also provided hope that thoughtful and coordinated action in the face of adversity will reduce morbidity and save lives. This Plan should help put the Nation on that path.

A concerted effort is needed to build and maintain the capabilities required to achieve the activities outlined in this plan. The Plan's success depends largely on the degree to which all stakeholders recognize their part in the shared responsibility for building national health security. While the activities identified in this plan provide important priorities for action, many other actions can also contribute to health security, including learning what the local community is doing to prepare, becoming involved in planning for incident response, volunteering, and even building stronger relationships with neighbors and community members. These are example of activities that individuals and organizations can take to support the efforts outlined in this plan.

The task of achieving national health security is complicated by the economic challenges the Nation currently faces and will likely continue to face in the years to come. In addition, government budgeting for fiscal years 2011 to 2012 is complete, so governmental funds to advance this plan are likely fixed unless supplemental funds are appropriated. In the current economy, significant new funds are unlikely; therefore, better leveraging of and planning surrounding fiscal and other resources among community and other partners is even more critical. At the same time, the public and private sectors are currently devoting significant sums of money to health security, and there are opportunities to improve coordination across sectors to ensure that these efforts are integrated in the most efficient and effective manners. So an important issue moving forward is to identify new approaches for leveraging existing resources (both financial and non-financial), and to identify opportunities to use resources to a greater effect in the future. Improved coordination and integration of existing activities and resources have the potential both to yield economic dividends as well as to minimize the morbidity and mortality consequences of large-scale health incidents.

This implementation plan is part of an ongoing, continuous process of building national health security. Progress on the activities outlined in this plan will provide important input for future

2616 versions of the NHSS and future implementation plans. Rigorous performance measurement is
2617 essential for providing feedback in this regard.
2618

APPENDIX A. ACTIVITIES FOR NATIONAL HEALTH SECURITY WITH NOTIONAL LEAD AND PARTNER AGENCIES

NOTE: The table below provides notional leads and potential partners for BIP activities. Notional leads and potential partners are illustrative. During the review and common process, we are requesting the Departments, Agencies, Divisions, Offices, and partners indicate activities for which they should be lead, co-lead, or a partner to implementation.]

Objective	Outcome	Activity	Notional Lead	Potential Partners
1. Foster informed, empowered individuals and communities	<i>1.1. Community members are educated about health threats, including how to prepare, how to respond, how to recover, and where to turn for help for both themselves and their neighbors</i>	1.1.1. Ensure that communications about community risks and threats address the functional needs of at-risk individuals (e.g., physical and cognitive disabilities, language isolation, or low health literacy), giving consideration to types of health threats and preferred or necessary modes of communication, culture, developmental age, trusted spokespersons/channels, preferred formats, and preferred languages	Local government	Local non-governmental agencies
		1.1.2. Incentivize communication that focuses on connections between individual and community preparedness	Local government	Local non-governmental agencies, private sector, OFBCI, OD, ACF, AOA, DHS, SAMHSA , CDC, ASPR
		1.1.3. Engage established and local organizations (e.g., cultural, civic, and faith-based groups, schools, and businesses) and social networks to develop and disseminate preparedness information and supplies (e.g., response kits with food provisions, etc.)	Local government	Local non-governmental agencies
	<i>1.2. Strong community partnership and integrated plans for health security are in place for response and recovery</i>	1.2.1. Establish a partnership (e.g., between local government agencies and NGOs, including private organizations) to conduct pre-event vulnerability assessments	Local government	Non-governmental organizations, industry, DHS, ASPR, CDC, IGA

Objective	Outcome	Activity	Notional Lead	Potential Partners
		1.2.2. Develop guidance on best practices in active involvement of government and non-governmental organizations, including the private sector, in local emergency planning committees or other relevant bodies with a role in health security	ASPR	IGA, OFBCI, DHS, HRSA, OD, DOC, SAMHSA, planning group comprised of local leaders representing government and non-governmental organizations, ASH
		1.2.3. Convene representatives from national and local NGOs along with the cross-sector federal agencies to identify key outcomes for and measures of resilience	ASPR	ASH, SAMHSA, ACF, AOA, OD, CDC, NGOs, OFBCI, IGA, IHS, academia, DHS, professional and governmental associations
	1.3. Social networks are developed and effectively used to enhance community education and awareness	1.3.1. Assess the location and robustness of social networks, with attention to which community organizations will serve as lead agencies in disseminating risk information and resources to constituents for response and recovery	ASPR	ASH, ASPE, training centers, CDC, local leaders (public health department and lead NGO(s) in community), local academic or other research community, DOE
		1.3.2. Begin to identify user-friendly methodology for assessment that can be used by diverse communities	ASPR	CDC, ASPE, IGA, OFBCI, DOD, research/academic organizations, DHS, ACF, HRSA, OPHS, IHS

Objective	Outcome	Activity	Notional Lead	Potential Partners
	<i>1.4. Individuals and communities are empowered to effectively incorporate risk information into preparedness, response, and recovery plans</i>	1.4.1. Identify the critical components in establishing a community's health security risk profile and develop a health security community risk profile template.	ASPR	DHS, DOD, DOJ, DOT, DOE, EPA, CDC, OFBCI, ONC, academia, NGOs, state and local government officials, ASH, FDA
		1.4.2. Develop a plan to use risk communication measures to monitor the uptake and use of messages as part of improving community-level preparedness	ASPR, CDC, local and/or state government agencies	Local non-governmental organizations, government associations, ASPE, ONC, ASPA
2. Develop and maintain workforce	<i>2.1. Staff and volunteers understand their roles and responsibilities in all phases of health incidents and can perform them efficiently and effectively</i>	2.1.1. Develop and implement competency-oriented job descriptions and use them to evaluate staff performance and effectiveness	Employers and volunteer coordinators for national health security personnel	Professional associations, training organizations, all levels of government, NGOs (including private sector)
		2.1.2. Adhere to NIMS compliance training requirements in accordance with prescribed roles and functions within the incident management framework during an exercise or real incident	ASPR	ASH, FDA, HRSA, CDC, professional associations, state and local governments
		2.1.3. Cross-train staff and volunteers to encourage flexibility and nimbleness	Employers and volunteer coordinators for national health security personnel	Professional associations, training organizations, all levels of government, NGOs (including private sector)

Objective	Outcome	Activity	Notional Lead	Potential Partners
	<i>2.2. Staff and volunteers have received competency-based national health security training, with credentialing used to ensure competence</i>	2.2.1. Establish partnerships between colleges/universities and employers to offer health security-related courses and learning opportunities for practitioners and volunteers to further their education	ASPR, CDC, colleges/universities	FDA, ASH, DOD, VA, DOT, DHS, USDA, employers and volunteer coordinators for national health security
		2.2.2. Synthesize existing data from research and other sources to generate health security competencies; develop new methods if/as needed to identify core health security competencies	ASPR, DOD	DHS, DOT, VA, USDA, EPA, DOL, FDA, HRSA, ASPE, SAMHSA, ACF, CDC, ASH, DOD, academia, professional associations, governmental associations
		2.2.3. Adapt training to align with and support mastery of health security competencies	ASPR, CDC	HRSA, state and local governments, professional associations, colleges/universities
		2.2.4. Deliver and disseminate competency-based training	CDC, ASPR	HRSA, CDC, state and local governments, colleges/universities
		2.2.5. Modify national health security training courses to increase access for practicing health care professionals	ASPR, CDC	Colleges/universities, training centers
		2.2.6. Use exercises to demonstrate and measure behavioral outcomes of training	CDC, ASPR	HRSA, state and local governments, CDC, IHS, colleges/universities
		2.2.7. Review existing continuous learning systems and assess the feasibility of creating an integrated and coordinated system to monitor health security competencies across sectors	CDC, ASPR	HRSA, AHRQ, CDC, DOD, DOT, academia, professional associations
	<i>2.3. Communities have an adequate number of staff and volunteers to perform the national health security capabilities, and can access and mobilize additional personnel as needed</i>	2.3.1. Identify the nature and scope of potential concerns from workers to serve during an incident; develop and begin to implement strategies to overcome any such resistance	ASPR, ASH	OSG; HRSA, CDC, professional associations

Objective	Outcome	Activity	Notional Lead	Potential Partners
		2.3.2. Conduct call-down/notification and assembly drills to test staff and volunteer mobilization	ASPR, ASH	HRSA, CDC, professional associations, state and local governments
	<i>2.4. Ongoing recruitment efforts secure the supply of national health security professionals and ensure that the workforce is replenished with high-quality applicants trained in the most current technical skills</i>	2.4.1. Synthesize existing data from research and other sources to generate a more complete picture of the size and composition of the workforce needed for health security	ASPR, CDC	DOL, DOD, DHS, DOT, HRSA, AHRQ, professional associations, academia, training centers
		2.4.2. Conduct a gap analysis of resource/personnel needs to achieve national health security capabilities; for workforce areas identified as shortage areas or unevenly distributed, work with appropriate stakeholders to develop and then begin to implement specific strategies to increase workforce size or address distribution issues for such categories	ASPR, CDC	DOL, DOD, DHS, DOT, HRSA, AHRQ, IHS, SAMHSA, ACF, FDA, CDC, professional associations, academia
		2.4.3. Develop effective strategies to retain public health workers and minimize turnover	ASPR	DOL, HRSA, AHRQ, DOD, DOT, professional associations, NGOs, academia, OPHS
		2.4.5. Promote ongoing efforts to increase interest in the field of public health	State and local governments, schools, academia	ASPR, CDC, DOE, HRSA,
	<i>2.5. The workforce reflects the demographic composition of the Nation and demonstrates an understanding and respect for cultural diversity</i>	2.5.1. Conduct recruitment and retention strategies with consideration of the demographic composition of the population served	Employers and volunteer coordinators for national health security personnel	DOL, ASPR, colleges/universities

Objective	Outcome	Activity	Notional Lead	Potential Partners
		2.5.2. Partner with institutions serving culturally diverse populations to recruit a diverse workforce to health security-related fields	Employers of public health and medical personnel; employers and volunteer coordinators for national health security personnel	Colleges/universities, IHS, OFBCI, CDC, DOL, HRSA, AHRQ
	2.6. A systematic approach, compatible across jurisdictions, is in place for coordination of volunteers at the local, state, and federal levels	2.6.1. Implement ongoing efforts to recruit volunteers	Employers and volunteer coordinators for national health security personnel	Colleges/universities, IHS, OFBCI, CDC, DOL, HRSA, AHRQ
3. Ensure situational awareness	3.1. Common national approach to situational awareness for national health security	3.1.1. Establish a governance model for situational awareness activities in support of national health security	OS, ONC	CDC, ASPR, FDA, USDA, EPA, DHS, state and local government officials, industry, academia, relevant discipline associations
		3.1.2. Identify and address federal, state, territorial, tribal, and local legal, policy, and political barriers to a common approach, building off of existing efforts	OS, CDC	OGC, ASPR, CDC, ASL, training centers, academia, DOJ, IHS; state, territorial, tribal, and local governments; non-governmental, private sector, and other relevant stakeholders and partners organizations
		3.1.3. Develop a taxonomy of decisions and decision-makers (authority, sectors, levels of government), to assist in identifying who needs what information (and for what purposes), possibly as part of an information management plan	OS, ONC, ASPR	CDC, SAMHSA, training centers, DHS, DOJ, DOD; state, territorial, tribal, and local governments; non-governmental private sector, and other relevant stakeholders and partners organizations

Objective	Outcome	Activity	Notional Lead	Potential Partners
		3.1.4. Establish a consortium of state, territorial, tribal, and local health departments to compile, implement, and evaluate a suite of low-cost, easy-to-implement innovative practices that allow public health authorities to collect and analyze data relevant to national health security	CDC	ASPR, OGC; state, territorial, tribal, and local officials, training centers, research organizations/academia
		3.1.5. Draft and implement a conceptual and technological approach in consultation with stakeholders across all sectors, which will provide clear and consistent expectations for a situational awareness system, possibly through a set of guiding definitions and principles to which entities at all levels must adhere	ONC	CDC, ASPR, DHS; state, territorial, tribal, and local government officials
	<i>3.2. Near real-time awareness of evolving health incidents, including source, scope, key unknowns, risk assessment, triggers linking information to response timelines, and projection of future trends</i>	3.2.1. As a means of facilitating and prioritizing evaluations, make an inventory of efforts related to health information systems and infrastructure, which will serve as a basis for future funding decisions	CDC	CDC, ASPR, FDA, ONC, DHS
		3.2.2. Build upon existing situational awareness resources by pursuing new capabilities to generate actionable information across all relevant sources of information	ONC, ASPR	Research centers, CDC, DHS, USDA, EPA, DOD, DOJ; state, territorial, tribal, and local governments; training centers
		3.2.3. Strengthen and expand existing capabilities to disseminate and share existing health security information quickly	ASPR, CDC	Research centers/academia, DHS, USDA, EPA, DOJ; state, territorial, tribal, and local governments; training centers
	<i>3.3. Near real-time awareness of availability of resources (both personnel and other) during health incidents, including both awareness of the current situation and projection of needs and anticipation of shortfalls</i>	3.3.1. Identify and, where necessary and possible, align existing federal, state, territorial, tribal, and local governmental and non-governmental systems, across sectors, for providing awareness of resources before, during, and after a response	ONC, DHS, OS, ASPR	CDC, USDA, EPA; state, territorial, tribal, and local governments; national and local non-government organizations; hospitals and health care providers; training centers

Objective	Outcome	Activity	Notional Lead	Potential Partners
		3.3.2. Develop and implement an integrated resource tracking strategy that works across sectors and capitalizes on existing resources, including identifying a minimal set of resource data that cuts across situations	DHS, ONC, ASPR	Research centers/academia, CDC, USDA, EPA; state, territorial, tribal, and local governments; national and local non-government organizations; hospitals and health care providers; training centers
		3.3.3. Identify and address proprietary interests (e.g., for hospitals, pharmaceutical industry, large nationwide laboratories) that may inhibit incorporation of private resources, including approaches for carefully controlled data sharing and maintaining confidentiality of information	ONC	Relevant industry associations, CDC, OGC, ASPR, DOJ
	<i>3.4. Effective coordination of health-related situational awareness, including scalability from local to national levels, with communication running both directions and laterally, and involving both public and private sectors, as well as both the United States and global partners</i>	3.4.1. Involve private hospitals, laboratories, and other industries in national, state, territorial, tribal, and local planning efforts for integrated situational awareness systems	CDC	ASPR; research centers; CDC; state, territorial, tribal, and local governments; national and local non-government organizations; hospitals and health care providers
		3.4.2. Support a collaborative environment for sharing situational awareness information	CDC	ASPR, research centers, CDC, DHS, USDA, EPA; state, territorial, tribal, and local governments; national and local non-government organizations; hospitals and other health care providers

Objective	Outcome	Activity	Notional Lead	Potential Partners
4. Foster integrated, scalable health care delivery systems	<i>4.1. Routine medical and behavioral health care, including emergency care, is provided fairly and efficiently based on need, situation, and available resources</i>	4.1.1. Continue to identify barriers to adopting electronic health records and develop plans to begin to address them	ONC	Health provider organizations, state and local government
		4.1.2. Strengthen information management to improve medical decision-making at the operational and policy level	AHRQ, ASPR, HRSA	Professional organizations, research centers, subject matter practitioners from public and private sector entities (e.g., academia, public health, emergency management)
	<i>4.2. In a health incident, local providers and institutions are capable of quickly shifting their approach from individual-based care to one that provides the greatest level of benefit for the largest number of people with available resources</i>	4.2.1. Establish a taxonomy of terms and measures to assess a health care delivery system's capability to deliver medical care in disasters and other public health emergencies	AHRQ, ASPR, HRSA	Professional organizations, research centers, Subject matter practitioners from public and private sector entities (e.g., academia, public health, emergency management)

Objective	Outcome	Activity	Notional Lead	Potential Partners
		4.2.2. Develop simple, phased, and practical plans for rapidly expanding health system capacity, based on objective baseline assessments, realistic targets for expansion, and rigorous exercises and tests to verify that systems can meet these targets	ASPR, CDC	HRSA, CMS, AHRQ, professional associations
		4.2.3. Develop mechanisms to swiftly reimburse health care providers, institutions and suppliers for care, supplies, equipment, and services delivered during a large-scale health incident	CMS, ASPR	Accreditation organizations; national medically- and community-related associations
	<i>4.3. Adequate legal protections and authorities relevant to delivering health care during emergency situations are in place and are understood by legal counsel and key decision-makers</i>	4.3.1. Identify current efforts by states, academia, legal experts and others to address the complex legal issues that arise during large-scale health incidents; initiate and support a coordinated approach to addressing these issues, and develop clear and consistent guidelines for future incidents	ASPR, CDC, FDA, ASH, OGC, IGA	DOJ, professional associations
		4.3.2. Clarify the circumstances that trigger waivers to existing federal laws and the process for initiating such waivers	ASPR, CMS	CDC, OGC
	<i>4.4. Public and private health care providers and stakeholders have formed partnerships and community health coalitions to support the delivery of mass casualty care</i>	4.4.1. Create a national network of community health care coalitions	ASPR	CMS, accreditation organizations; national medically- and community-related associations

Objective	Outcome	Activity	Notional Lead	Potential Partners
		4.4.2. Identify options and strategies to create incentives – financial and otherwise – for health care providers, legal counsel, non-governmental organizations, businesses and other key stakeholders to participate in national health security activities through health care coalitions	ASPR, CMS	National professional and organizational associations
5. Ensure timely and effective communications	<i>5.1. Regular information exchange with the public</i>	5.1.1. Identify, collect, and disseminate successful strategies/practices for receiving information from the public both routinely and during an incident	CDC	ASPA, ASPR; state, territorial, tribal, and local governments; communications media, social media
		5.1.2. Identify and access existing communication networks (both formal and informal) that include health officials, behavioral health experts community leaders, community-based organizations, and the public	CDC	ASPA, ASPR; state, territorial, tribal, and local governments; communications media; social media
		5.1.3. Develop and disseminate methods to effectively monitor for and address rumors and misperceptions circulating during an incident	CDC	ASPA, ASPR; professional associations; research centers; academia; state, territorial, tribal, and local governments
	<i>5.2. Accurate, credible, understandable, and actionable information is provided to the public in a timely way</i>	5.2.1. Expand and maintain an online library of communication resources	CDC	ASPA, ASPR, research centers, professional associations, academia; state, territorial, tribal, and local governments
		5.2.2. Build capability to rapidly test and/or evaluate messages so that they can be adapted as needed during an incident	CDC	ASPA, ASPR, research centers, academia; state, territorial, tribal, and local governments

Objective	Outcome	Activity	Notional Lead	Potential Partners
		5.2.3. Facilitate and encourage research to evaluate the effectiveness of existing risk communication training programs; maintain, expand, revise, or discontinue as warranted by study results	CDC	ASPA, ASPR, research centers; academia; state, territorial, tribal, and local governments;
		5.2.4. Engage behavioral health subject matter experts in communication planning and message dissemination	CDC	ASPA, ASPR, research centers; academia; state, territorial, tribal, and local governments;
	5.3. <i>Information provided to the public is coordinated and consistent across all response organizations</i>	5.3.1. Develop emergency communication plans that coordinate message development and dissemination strategy across all levels of government and with community partners	CDC, DHS	ASPR, DHS; state, territorial, tribal, and local governments; non-governmental organizations
		5.3.2. Test crisis and emergency risk communication plans through drills/exercises; include relevant community partners in exercises	CDC, DHS	ASPR, DHS; state, territorial, tribal, and local governments; non-governmental organizations
		5.3.3. Maintain and expand, as appropriate, the website phe.gov, which aggregates all health security information and serves as a one-stop site for the public to find preparedness, response, and recovery information	ASPR	ASPR, CDC
	5.4. <i>Information reaches all members of target population; including at-risk individuals</i>	5.4.1. Facilitate and encourage rigorous formative research to identify information needs, effective media channels, and trusted spokespersons for the range of population groups within a community	CDC	ASPA, ASPR; state, territorial, tribal, and local governments; non-governmental organizations; research centers; academia
		5.4.2. Explore options for more effective use of media channels (including social media such as Twitter and Facebook) in disseminating public health messages	CDC	ASPA, ASPR; state, territorial, tribal, and local governments; non-governmental organizations, research centers, academia
		5.4.3. Translate relevant research (e.g., health literacy) and scientific guidance to be easily understandable and implementable in practice for a range of populations, while still maintaining accuracy; disseminate to state, territorial, tribal, and local personnel	CDC	ASPA, ASPR, research centers; academia

Objective	Outcome	Activity	Notional Lead	Potential Partners
		5.4.4. Actively engage population representatives in identifying and addressing any communication issues/concerns	CDC; state, territorial, tribal, and local governments	Non-governmental organizations
	5.5. <i>Secure, sustainable, interoperable, and redundant systems/equipment</i>	5.5.1. Coordinate emergency communications grant priorities and guidance across all U.S. government departments and agencies	DHS, ASPR	ASPR
		5.5.2. Facilitate and encourage research to identify innovative and effective strategies for inducing non-governmental emergency responders (e.g., hospitals) to invest in interoperable communications technology	DHS	ASPR, ASPA, CDC, research centers, academia
		5.5.3. Develop appropriate communication caches that can be used by rapid assessment teams to support no-notice events such as earthquakes and chemical or biological attacks	DHS	ASPA, ASPR, CDC
	5.6. <i>Effective communication within and across all response organizations</i>	5.6.1. Ensure that public health and medical care emergency communication roles, responsibilities, and activities are coordinated and consistent across relevant response frameworks (e.g., NHSS, National Response Framework)	DHS, ASPR	CDC
		5.6.2. Integrate health care and public health organizations more fully into activities and programs run through the Office of Emergency Communications in the Department of Homeland Security	DHS	ASPR, CDC; state, territorial, tribal, and local governments; professional associations, health care providers
		5.6.3. Implement and refine statewide Communication Interoperability Plans (SCIPs)	CDC; state, territorial, tribal, and local governments	Health care providers

Objective	Outcome	Activity	Notional Lead	Potential Partners
7. Environmental and emerging threats	<i>7.1. Enhanced risk analysis and research to improve understanding and anticipation of environmental and emerging threats</i>	7.1.1. Strengthen and integrate risk analysis techniques	DHS, ASPR, CDC	CDC, FDA, EPA, USDA, DOD, DOE, corresponding state and local agencies, pertinent industries, colleges/universities
		7.1.2. Capture ongoing research and develop an agenda for new research to expand knowledge of factors contributing to the development of threats, including physical and social environmental, and biologic and genetic factors	ASPR, CDC, NIH, FDA	DHA, DOD, EPA, USDA, DOE, VA, colleges/universities
	<i>7.2. Improved mechanisms to prevent and mitigate existing and novel environmental and emerging threats, including those relating to food safety and resulting from the misuse of life sciences information and technology</i>	7.2.1. Improve food and water safety	FDA, USDA, EPA	ASPR, CDC, corresponding state and local agencies, pertinent industries, colleges/universities
		7.2.2. Improve control and mitigation of zoonoses and other infectious diseases	CDC	ASPR, OGHA, CDC, NIH, DOT
		7.2.3. Improve the safety of workers during incidents and in the recovery phase	DOL, CDC, ASPR	DHS
		7.2.4. Prevent and mitigate health effects related to environmental hazards	DHS, EPA, USDA, FDA, CDC	State environmental protection agencies
		7.2.5. Prevent and mitigate threats posed by the misuse of life sciences information and technology	USDA, CDC	DOJ, ASPR, DHS
	<i>7.3. Enhanced ability to detect and report environmental and emerging threats early and characterize them fully</i>	7.3.1. Improve surveillance	CDC, EPA, USDA, DHS, FDA	ASPR

Objective	Outcome	Activity	Notional Lead	Potential Partners
		7.3.2. Ensure the capability and capacity to efficiently and accurately conduct environmental sampling	EPA, FDA, USDA	CDC, NIH
		7.3.3. Monitor long term health effects	CDC	NIH, DOL
	<i>7.4. Improved ability to respond and recover effectively and efficiently to health incidents caused by environmental and emerging threats</i>	7.4.1. Improve federal, state, local, and private sector to respond to food-related threats	FDA, CDC	State and local government agencies
		7.4.2. Enhance laboratory support for the management of emerging threats	CDC	CDC, ASPR, FDA, USDA, EPA, DHS, national science-based or laboratory based organizations or associations
		7.4.3. Increase ability to develop, deploy, and administer medical countermeasures (for both pediatric and adult populations) for newly emerging diseases, pandemics, or novel threats	ASPR	Local and state governments, ASPR, NIH, CDC
		7.4.4. Enhance the legal framework and capabilities related to emerging threats	FDA, EPA	ASL, CDC, DOJ, OGC
8. Recovery	<i>8.1. Each community will have a plan for health, behavioral health, and social services recovery, which also acknowledges the recovery needs stemming from multiple health incidents</i>	8.1.1. Establish recovery coordination capacity to reconstitute health, behavioral health, and social services infrastructure at the community, state, and federal level	State government with designated local non-governmental organization	Local government, local non-governmental agencies, OPHS, ASPR, CDC, SAMHSA, ACF, AOA, CMS
		8.1.2. Create plans to promote recovery of the affected community members and responders with behavioral health and social services needs	Local government	State government agencies, ASPR, ACF, AOA, SAMHSA

Objective	Outcome	Activity	Notional Lead	Potential Partners
		8.1.3. Develop partnerships and memoranda of understanding (MOUs) with local government agencies and NGOs	Local government agency on social services and mental health with designated lead case management agency	Other local government, and local non-governmental agencies, ASPR, OFBCI, CDC
	<i>8.2. Health, behavioral health, and social services provided to residents during an incident response will be seamlessly transitioned and coordinated from first responders to the government and non-governmental organizations responsible for recovery and community restoration</i>	8.2.1. Incorporate transition-to-recovery planning into federal, state, and local emergency plans and include government and non-governmental partners (including health, behavioral health and social service organizations) as part of incident planning groups NOTE: Please note that we will modify this bullet once final language is available from the NDRF. This will ensure that this activity remains but is appropriately complementary.	TBD	TBD
		8.2.2. Establish guidance on roles and responsibilities among federal, state, and local government as well as non-governmental partners to ensure continuity of health and social services	ASPR, DHS	CDC, SAMHSA, ACF, AOA to provide advice; a planning group to work with HHS that includes local government and non-governmental representatives
	<i>8.3. Regular monitoring and evaluation of recovery efforts will take place to ensure that short- and long-term recovery needs related to health, behavioral health, and social services are met and that lessons learned are incorporated into future recovery plans</i>	8.3.1. Ensure that all disaster plans have identified common data elements (e.g., benchmarks for disaster operations, relevant data from response) to facilitate seamless monitoring and evaluation of health, behavioral health, and social services pre-, during, and post-incident and begin developing tools to support state and local recovery planning groups' integration of these elements into their disaster plans	OPHS	ASPR, CDC, SAMHSA, ACF, AOA, a planning group to work with HHS that includes local government and local non-governmental representatives

Objective	Outcome	Activity	Notional Lead	Potential Partners
		8.3.2. Build the capacity of local communities to better utilize existing data on health, behavioral health, and social services from FEMA and other state and local sources	ASPR, DHS	CDC, SAMHSA, national associations representing governments, and a planning group to work with HHS that includes local government and non-governmental representatives
		8.3.3. Develop a centralized and accessible system to aggregate the recovery-related lessons learned from local communities (e.g., after action reports) and disseminate these lessons to communities with accompanying tools/supports and incentives to use them	OPHS, DHS	ASPR, DHS, CDC; state, territorial, tribal, and local governments; and local nongovernmental organizations
	<i>8.4. Protocols and plans for leveraging resources will be in place to rapidly assess and finance or support community long-term recovery needs after an incident</i>	8.4.1. Review current policies and protocols for financing long-term recovery (i.e., disbursing, length of financing, transition point when local government/private sector starts providing more of the recovery financing)	OPHS, DHS	ASPR, CDC, CMS, a planning group to work with ASPR that includes local government and non-governmental representatives
		8.4.2. Identify mechanisms to streamline disaster recovery funding and ways to appropriately leverage existing resources	ASPR, CDC, DHS	State and local government
		8.4.3. Develop plans to assess community needs for resource allocation at the onset of an incident to activate funding plans quickly	Local government (e.g., public health, emergency management, social services, housing) with local non-governmental organization (designated coordinating body)	State governments, ASPR, CDC, OPHS, ACF, AOA, HRSA, DHS, other members of local emergency planning and/or recovery committee
9. Global health security	<i>9.1. U.S. collaboration and diplomatic engagement with key domestic and international stakeholders are strong and well coordinated</i>	9.1.1. Foster effective cross-border engagement with Canada and Mexico by building new activities upon existing structures	OS, ASPR, CDC	NIH, DOS

Objective	Outcome	Activity	Notional Lead	Potential Partners
		9.1.2. Promote multilateral and multinational engagement	OS, ASPR, CDC	NIH, DOS
		9.1.3. Enhance strategic bilateral engagement	OS, ASPR, CDC	NIH, DOS
	9.2. <i>The United States and other countries and partners have strengthened their capacities for cross-border and broader international health security</i>	9.2.1. Continue to support the development of early warning surveillance and situational awareness reporting infrastructure	OS, ASPR	CDC, NIH, DOS
		9.2.2. Enhance public health security in travel and transport	OS, CDC	DOS
		9.2.3. Develop USG international response plans	OS, ASPR	CDC, DOS
		9.2.4. Strengthen health systems to respond to health security incidents	OS, ASPR	CDC, DOS
		9.2.5. Enhance laboratory biosafety and biosecurity practices	OS, NIH, CDC	NIH, CDC, DOS
		9.2.6. Improve food security and food, drug and product safety	OS and FDA or USDA depending upon product involved	State food and agricultural agencies, CDC, DOS
		9.2.7. Collect and disseminate lessons learned and conduct relevant research	OS, CDC	NIH, ASPR, DOS
		9.2.8. Promote human capital development in the traditional classroom or meeting room setting and/or through novel information dissemination and knowledge management technologies in the virtual environment	OS, CDC	NIH, ASPR, DOS
10. Science, evaluation and quality improvement	<i>10.1. Efforts to improve science, evaluation, and quality improvement are developed through meaningful interagency, inter-sector collaborations</i>	10.1.1. Develop and formalize a Research and Evaluation Collaborative	ASPR	CDC, DHS, DoD, national associations, federally-supplemented research centers, other research organizations and accreditation organizations

Objective	Outcome	Activity	Notional Lead	Potential Partners
	<i>10.2. National health security is informed by a science base and supported by a coordinated agenda research and evaluation</i>	10.2.1. Develop, disseminate, and update syntheses of existing governmental and non-governmental research and evaluation efforts	ASPR	CDC, VHA, DHS, DoD, in partnership with university-based and other researchers and evaluators
		10.2.2. Develop and disseminate a coordinated research and evaluation agenda	ASPR	CDC, VHA, DHS, DoD
		10.2.3. Develop and disseminate standards of proof for evidence-based practices	ASPR	CDC, VHA, DHS, DoD, professional associations, universities
	<i>10.3. National health security can be measured, evaluated, studied, and improved via a coordinated set of performance measures and standards</i>	10.3.1. Develop consensus among key partners around a common methodological framework to guide measure and standards development	ASPR	CDC, VHA, DHS, DoD, professional associations, universities
		10.3.2. Develop consensus on and begin executing a work plan for a common core of health security measures and standards	ASPR	CDC, VHA, DHS, DoD, professional associations, universities
	<i>10.4. Coordinated, user-friendly information about national health security is reported to key stakeholders</i>	10.4.1. Produce regular, integrated public reports on national health security	ASPR	CDC, DHS, DoD, local and state government officials
	<i>10.5. Key stakeholders have tools to continuously improve national health security</i>	10.5.1. Review existing QI programs and tools/techniques and, if needed, identify and support development of new tools	ASPR	CDC, DHS, DoD, local and state government officials, universities, accreditation agencies
		10.5.2. Disseminate and incorporate QI training and tools into federal grant guidance, accreditation, and education/training programs	ASPR	CDC, DHS, DoD, HRSA, accreditation agencies

