



Annex 11:

2008 Sector CIKR Protection Annual Report for the Healthcare and Public Health Sector

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Homeland
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Foreword

The Healthcare and Public Health (HPH)¹ Sector established a process in 2007 for collaborating with its constituents to manage deliverable tasks, such as the Sector Annual Report and Tier 2 identification process. The process enables extensive collaboration, incorporating a weekly review and comment period followed by a joint conference call of the Healthcare Sector Coordinating Council (SCC) and the Government Coordinating Council (GCC) along with other Sector subject matter experts (SMEs) and academia. As a result of formalizing the review process, the HPH Sector was able to achieve significant collaboration and participation in the Sector Annual Report development process; moreover, the formalized framework facilitated an environment ripe with recommendations for framing and achieving Sector critical infrastructure and key resources (CIKR) protection and preparedness initiatives.

The HPH Sector Coordinating Council (SCC) comprises a diverse group of subsector organizations and associations, including (1) Healthcare Personnel; (2) Insurers, Payers, and Health Maintenance Organizations; (3) Information Technology; (4) Laboratories and Blood; (5) Mass Fatality Management Services; (6) Medical Materials Coordinating; (7) Medical Treatment; (8) Occupational Health; and (9) Pharmaceuticals and Biotechnology. In an effort to engage the Sector partnership, a number of media are used to facilitate collaboration across Sector initiatives. For instance, meetings are scheduled at least biannually, with intermittent conference calls and the initiation of work groups on a range of topics, from Homeland Security Presidential Directive (HSPD) 21 and development of Tier 2 criteria to establishing Sector-specific metrics and the Strategic Homeland Infrastructure Risk Assessment process. Over the past several months, engagement has increased to cover an array of CIKR activities. Participation in the Sector Annual Report review process resulted in formulating new objectives for the Sector (a component outside of the required reporting activities), while initiation of Sector-specific metrics has generated systematic and collaborative efforts to identify measures for assessing risk reduction efforts across a diverse group of subsector entities.

Regular meetings and teleconferences with members of the HPH GCC provided considerable opportunities for input into all sections of the report. Areas receiving the greatest attention included section 1, Sector Security Goals and Priorities; section 3, CIKR R&D Progress; section 5, CIKR Protection; and Attachment C, Capability Gap Statements. (The other attachments are Attachment A, Acronym List, and Attachment B, Sector Objectives.) The Sector's attention and efforts regarding the Sector Annual Report allowed completion of the protection information requirements three weeks prior to the final deadline. From February through June 2008, the Joint Advisory Working Group for Research and Development (R&D) and Modeling, Simulation, and Analysis (MS&A) invested substantial time to investigate and analyze gaps in Sector protection and preparedness capabilities. Participants, including academia, private companies, medical professionals, and public health partners from the local, State, and Federal levels, brought thought, leadership, and years of experience to identify, define, and establish HPH priorities for R&D and MS&A. All of the organizations were provided the opportunity for input into development of the R&D chapter.

¹ Attachment A provides a list of acronyms used in this report.

The 2008 Sector Annual Report development process reflected a significant achievement in collaboration, as well as in the ability to bring private sector concerns to the forefront. These efforts and the combined partnership enabled development of an annual report that is holistic in historical representation and comprehensive in vision.

Executive Summary

The Healthcare and Public Health Sector is pleased to provide the U.S. Department of Homeland Security (DHS) the 2008 HPH Sector Annual Report. The Sector has continued to make progress over the current reporting period of June 1, 2007 – May 30, 2008, both within the Sector and across sectors as a result of its security partnerships. A significant portion of work in the HPH Sector has been accomplished through collaborative efforts by and between Sector partners and government agencies, as well as private and public sector constituents. This report reflects the state of the HPH Sector, highlighting the work the Sector has initiated and activities that have been completed in support of the Sector's vision, mission, and goals. The report highlights the Sector's accomplishments and successes, details Sector priorities, identifies areas that require focused attention, and provides the continuation of a roadmap of activities that the Sector anticipates accomplishing or initiating in the coming year.

Sector Goals and Priorities. Similar to the development of the 2007 Healthcare and Public Health Sector Annual Report, section 1 of this document characterizes how the Sector security partnership took the opportunity to review the Sector's priorities and the steps taken to meet the Sector's goals. Participation across the public and private sector security partners helped develop a refined set of HPH goals and priorities, as well as align objectives. The security partnership refined the goal for Workforce Security to focus on Workforce Sustainability² while continuing to support the previous goals for Physical and Cyber Security and Service Continuity. The security partnership also narrowed the Sector objectives to reflect actionable requirements that support accomplishing goals and priorities.

Key Programs. Section 2 of this document, Sector Programs, Activities, and Tools, reflects how the Sector CIKR Risk Profile informs the Sector programs that are intended to foster longevity and sustainability of the varying healthcare and public health missions and needs. Many of the most notable programs within the HPH Sector, even those that are supported through grants funding, can be characterized as being focused more on consequence management and responding to and ensuring that the Sector is resilient for continued operation during an event. The HPH Sector experiences significant cross-sector interdependencies in support of its primary mission, and as a result, it has established extensive partnering relationships across sectors. Additionally, through its government and private sector security partnership, the Sector continues to develop processes and mechanisms to support a wide range of information-sharing efforts.

R&D Efforts. One of the more significant areas of progress within the Sector is reflected in section 3 of this document, CIKR R&D Progress and Updated Capability Gaps. The HPH Sector Joint Advisory Working Group for R&D and MS&A has made significant progress working across the sector(s) to inform and advance the preparedness and response capabilities for the Sector. Since it was established in September 2007, the Work Group has closely engaged the academic community to help inform activities and develop collaborative relationships with DHS's Directorate of Science and Technology (S&T), the National Infrastructure Simulation and

² Maintaining the greatest number of available workforce members to be leveraged during a disaster.

Analysis Center (NISAC), and the Office of Health Affairs. The R&D Work Group has defined two focus areas for the coming year: (1) Medical Surge Capacity and (2) Biosurveillance: Workforce Sustainability. Using the Critical Infrastructure Partnership Advisory Council (CIPAC), the Sector partnership formalized the identified capability gaps into requirements statements for these two key areas.

Funding. Section 4 of this document, Funding Priorities, provides a view into a limited set of activities and funding that support Sector protection and preparedness. Currently, there are no data on GCC investments related to CIKR, nor are there any data on private sector investments, although it should be noted that to a large degree, private sector investments are supported through grant programs funded by DHS, the U.S. Department of Health and Human Services (HHS), and the Centers for Disease Control and Prevention (CDC). These investments are significant in the context of overall expenditures for protection and preparedness programs. In addition, the funding section of the report does not provide a holistic representation of funding expenditures. The HPH Sector principally focused on consequence reduction related to all hazards, and it has a lead role in the protection of the domestic population against disease and contamination of the environment. Thus, significant monies are devoted to public health programs in support of such things as disease prevention but are not recognized in the context of Critical Infrastructure Protection.

Security Practices. Section 5 of this document, CIKR Protection: Security Practices and Obstacles, reflects key Sector practices, programs, and impediments to achieving a highly resilient sector. Of the totality of programs reflected, several were considered by the Sector to serve broad protection, preparedness, and response functions, thus indicating their criticality to the Sector mission. Those programs found to be most relevant were then reflected in the Sector Risk Reduction Activity Questionnaires. Most importantly, this section of the report characterizes the greatest obstacles to developing and maintaining security practices within and across the Sector.

Progress and Path Forward. Progress and program effectiveness are described in Section 6, Program Effectiveness and Continuous Improvement. The aspects of metrics, measurements, and progress have been formalized in this year's Sector Annual Report. The Sector, along with the National Infrastructure Protection Plan (NIPP) Program Management Office, has established a baseline for Core and Programmatic Metrics. The Sector, through its security partnerships, has also begun developing Sector-specific metrics. This section begins to lay out the path forward for the coming year, by which the Sector will measure itself over the long term.

Section 1: Sector Security Goals and Priorities

The Healthcare and Public Health (HPH) Sector is a vital component of our Nation's stability and longevity; it comprises interconnecting operations, information-systems, activities, processes, and resources, and healthcare functions as a single system for the provision of care and emergency response. Taken independently, public health has one of the most singularly diverse and essential roles across all healthcare capabilities, from food and water protection to emergency planning, management, and policy development. The HPH Sector has the vision of achieving overall resiliency against all hazards — natural and manmade — in order to prevent or minimize damage to, or destruction of, the Nation's healthcare and public health infrastructure, and to preserve the ability to mount timely and effective responses to both routine and emergency situations while continuing to provide continuity of services in non-affected areas. The Sector strives to identify, analyze, and develop approaches to ensure continuity of mission through preparedness and response, with a focus on consequence reduction across the Sector.

The general perspective within the intelligence and healthcare community is that healthcare is at low risk of a direct attack from terrorism. While this may be true, recent history has demonstrated that Sector assets and services are highly vulnerable to environmental and other natural hazards. The challenge facing Sector leadership involves the ability to encourage a culture of preparedness that promotes investment in protection and security concepts. For the HPH Sector in particular, a complicating factor is that each industry, institution, and organization must be prepared not only for the impact of the threat on its ability to perform, but also must be prepared to handle a simultaneous surge in demand for goods and services resulting from an event. The fact that healthcare and public health is a services-based Sector, whose capabilities are almost wholly reliant on specialized personnel, dedicated treatment environments, unique supplies and equipment, and resources from outside the Sector, exemplifies the complexity of the Sector. It is for this reason that security goals and priorities for healthcare and public health are geared toward mitigating the negative consequences of a disaster and instilling resiliency in Sector capabilities.

1.1 Sector Security Goals

Sector security goals, identified below (table 1-1), have been updated in this year's Sector Annual Report to be more concise and to highlight areas requiring the greatest focus. Goals were developed collaboratively under the Critical Infrastructure Partnership Advisory Council (CIPAC), giving greatest consideration to the need for protecting the workforce and to affecting a desired level of mission functionality in the face of all hazards. Goals anticipate that events will occur, but they also recognize the need to plan for and implement actions to reduce the negative consequences of events. To achieve Sector security goals, infrastructure-protection mission objectives must drive Sector leaders to focus on security and protection of vital assets, systems, networks, and functions, and to develop strategies for responding to and recovering from an event. The Sector continues to move forward in accordance with the vision statement adopted in 2006, to achieve resiliency across the Sector.

With this year’s Sector Annual Report, healthcare and public health has introduced and adopted a Sector mission statement. The mission statement reflects concerns from the Sector that they are at significantly greater exposure of risks resulting from all hazards than nearly all other critical infrastructure and key resources (CIKR) sectors. As a result, Sector activities, initiatives, and programs center on consequence reduction. In addition to this, as a system, healthcare and public health owners and operators participate in a myriad of complex relationships, each of which is only sustainable to the extent that each dependent relationship is also sustainable. The HPH mission statement, therefore, necessarily focuses on supporting effective emergency preparedness and response to nationally significant hazards. This focus gives recognition to the fact that healthcare and public health acts as both a source of protection and response to the U.S. population. Should any capability within the system be degraded, it could lead to mission failure. The Sector’s vision, mission, and goals are designed to anticipate and mitigate such occurrences.

Table 1-1: Healthcare and Public Health Sector Security Vision/Mission Statement and Security Goals

Sector Vision	
<i>The HPH Sector will achieve overall resiliency³ against all threats — natural and man-made. It will prevent or minimize damage to, or destruction of, the Nation’s healthcare and public health infrastructure. It will preserve its ability to mount timely and effective responses, without disruption to services in non-impacted areas, and its ability to recover from both routine and emergency situations. It strives to protect its essential workforce from harm resulting from all hazards, including terrorist or criminal activities, natural disasters, and serious infectious disease outbreaks.</i>	
Healthcare and Public Health Sector Mission Statement	
<i>The mission of the HPH Sector is to sustain the essential functions of the Nation’s healthcare and public health delivery system and to support effective emergency preparedness and response to nationally significant hazards by implementing strategies, evaluating risks, coordinating plans and policy advice, and providing guidance to prepare, protect, prevent, and when necessary, respond to attacks on the Nation’s infrastructure and ensure the necessary resiliency in infrastructure to recover and reconstitute healthcare and public health.</i>	
Sector Goals	
Sector Workforce Sustainability	
Goal 1	Protect the workforce from the harmful consequences of hazards that could compromise their health and safety while carrying out their HPH roles and responsibilities. Under certain circumstances, the consideration of health and safety should be extended to the families of those workforce members required during emergency response and recovery functions.
Physical Security	
Goal 2	Deter and protect against attacks intended to destroy or degrade facilities and Sector assets.
Goal 3	Protect the Sector’s physical assets and critical organizational systems from the consequences of all hazards.

³ Sector Resiliency – The ability to rebound during a crisis or a disaster by developing strategies, policies, procedures, and mechanisms to ensure continued operational effectiveness throughout the event. Infrastructure resilience requires a proactive approach to crisis management.

Table 1-1 (Cont.)	
Sector Goals	
Goal 4	Deter and protect against insider threats and security weaknesses that may result in the loss or destruction of critical organizational systems.
Cyber Security	
Goal 5	Prevent and protect against unauthorized use, disclosure, modification, or exploitation of electronic information and the systems that maintain that data.
Goal 6	Protect against threats to cyber assets that may result in disruption to or denial of cyber services.
Service Continuity	
Goal 7	Prevent or mitigate the consequences of disruptions to the supply chain or diversion of supplies that could significantly impair continuity of Sector operations.
Goal 8	Maintain the availability of supporting services and resources upon which the Sector is dependent (e.g., water, power, food, transportation, fuel.)
Goal 9	Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions both during and following an event.

1.2 Sector CIKR Risk Profile

The CIKR risk profile, developed by the Homeland Infrastructure Threat and Risk Analysis Center (HITRAC), provides a terrorist risk summary that focuses on threat. While the HPH Sector is recognized to be at risk from terrorism, it is likely to be at greater risk of consequences resulting from all hazards, in particular contagious and non-contagious diseases.⁴ It should be noted that there are many methods for assessing risk, including those methodologies that focus on vulnerability and consequences over threat type and likelihood. The risk profile also recognizes the Sector's workforce as its greatest asset, deviating from traditional physical asset-criticality indicators. Healthcare and public health has the primary role of protection against disease and the responsibility for intervention in the event of contamination, outbreaks, and environmental disasters. Unlike nearly all other sectors, HPH is placed on the front lines, directly in the path of impacts from a disaster, carrying out such activities as surveillance, delivery of medical materials, mass prophylaxis, patient care, and fatalities management. This aspect of healthcare is rarely given the appropriate level of examination in the context of Critical Infrastructure Protection (CIP), yet its workforce and services are placed at considerable risk of negative impacts from cascading consequences related to all hazards.

Risk management activities and programs are typically aligned with consequence reduction and response, recovery, and reconstitution efforts. Program examples include, but are not limited to, U.S. Department of Health and Human Services (HHS) Biomedical Advanced Research and Development Authority (BARDA), the Hospital Preparedness Program (HPP), the Centers for Disease Control and Prevention (CDC) Public Health Information Network (PHIN), and ICERx, a private sector program to support the care of victims during a disaster. In addition, the Sector continues to provide recommendations for more effective processes, policies, and procedures

⁴ DHS HITRAC Terrorist Risk Profile for Healthcare and Public Health 2008.

related to response and recovery. While such initiatives are often perceived as falling outside of core protection requirements, they are nonetheless the foundation by which all sectors can build resiliency concepts into planning and risk management activities.

The Healthcare and Public Health Sector risk profile forms the basis for which the U.S. Department of Homeland Security (DHS) anticipates that significant programs, tools, and initiatives will be developed. It is also used as a tool to validate the need for funding in the form of grants and other programs to the Sector. Due to its scope, however, the current risk profile does not present a holistic view of HPH in the context of its mission. In order to fully appreciate the Sector's risk, it is essential that the profile give consideration to its role in protecting the nation, its need to sustain an effective mission under all circumstances, and the expectation that it will ensure protection of even those services over which it has very little control, such as the medical supply chain.

1.3 CIKR Protection Gaps

At this time, the Sector has incomplete information on protection efforts and risk management activities across assets, systems, networks, and functions, thus hindering its ability to identify CIKR protection gaps as they relate specifically to the Sector Terrorist Risk Profile. However, the Sector has identified other relevant gaps that would further preparedness, response, and recovery initiatives related to all hazards. Many of these gaps have been identified as obstacles, such as impediments to information sharing, an understanding of cyber threats to the Sector, protection of the medical supply chain, and a lack of scientific analysis of Sector interdependencies. In addition, those gaps that are most apparent irrespective of further analysis have been developed into requirements for Research and Development (R&D) and Modeling, Simulation, and Analysis (MS&A). Emphasis across gaps has been placed on supply chain, medical surge, workforce sustainability, and policy and legal issues.

One methodology for better understanding the totality of Sector risk is through network analysis, modeling, and simulation. Network analysis will result in a methodical, Sector-wide identification of essential capabilities, the functions that support those capabilities, links between capabilities and activities, and essential resources. More importantly, this approach will reveal the underlying building blocks of and relationships within the system, which if destroyed or degraded could have cascading effects resulting in overall mission failure.

Leveraging the network analysis data, the Sector is able to integrate modeling and simulation of varying scenarios with a focus on Sector dependencies nationally, regionally, and locally to develop mitigation strategies, enhance protective programs, and identify gaps in services associated with emergency response, recovery, and consequence reduction activities. The Sector is currently applying this process to better understand the complex relationship between Sector capabilities, functions, resources, and cross-sector dependencies.

1.4 Sector Priorities

The Healthcare and Public Health Sector priorities identified below reflect a deliberate effort on the part of the Sector to focus on workforce protection and service continuity, reflecting actions that are designed to achieve resiliency. Maintaining mission effectiveness requires skilled workforce members who have access to medical materials and equipment in sufficient quantity to be effective in their efforts. Maintaining a full, mission-ready workforce with physical and information technology (IT) support, combined with access to critical medical materials and equipment, is essential for this Sector to, at a minimum, sustain continuity of services while providing adequate response to an event. All of these priorities remain important to the Sector; therefore, the order of the priorities is not intended to suggest order of importance.

- Implement measures to protect the healthcare and public health workforce from direct threats to their health and ability to carry out their responsibilities. (Goal 1)
- Develop a strategy for Sector information sharing that gives consideration to data collection, communications on threat, and implementation of Sector requirements, in collaboration with the Government Coordinating Council (GCC), Health Sector Coordinating Council (SCC), and other security partners as required. (All Goals)
- Encourage risk assessments to be conducted on infrastructure identified as engaged in research, diagnosis, production, storage, or transportation of medically necessary products, medical countermeasures,⁵ and critical medical device systems. (Goals 2, 3, 4, and 7)
- Work collaboratively with Sector security partners, R&D organizations, and the DHS Directorate of Science and Technology (S&T) to develop and leverage security technologies for application in the HPH Sector to protect against cyber threats intended to disrupt or deny services, and for which such systems are essential to continued operations of the HPH Sector. (Goals 5 and 6)
- Identify and assess HPH Sector CIP protection and preparedness programs to determine alignment with Sector security goals and objectives; to the extent practicable, conduct a gap analysis between Sector programs and stated goals and objectives; and develop a strategy to mitigate gaps in Sector protection and preparedness programs. (All Goals)
- Establish agreements and other mechanisms with Sector security partners necessary for the operations of HPH services (especially water, energy, and transportation) and contract service organizations (e.g., professionals, technicians, temporary staff, vendors, and maintenance services) to ensure that healthcare-related facilities and public health operations are considered to have priority for restitution or allocation when services are limited or following an interruption. (Goals 7–9)

⁵ Medical Countermeasures are vaccines, biologics, pharmaceuticals, medical/surgical supplies, and equipment needed to prepare for, respond to, or recover from a domestic catastrophic health event.

- Focus on risks and consequences associated with large-scale emergencies or disasters (e.g., management of pharmaceuticals, medical supply delivery or transportation, medical-device demand, supply chain processes, blood services, and preparation for mass casualties) that may result in mission degradation or disruption. (All Goals)

- Working with manufacturers and distributors, seek out those incentives that are necessary to provide an adequate amount of the critical medical materials and equipment to be maintained in compliance with current industry- and regulatory-body standards. Work with Federal, State, local, and tribal authorities, as well as with commercial storage vendors and non-governmental institutions entrusted with storing components of the Strategic National Stockpile, to assure that stockpiles that are maintained in these entities are stored in controlled conditions and that these stockpiles are consistently rotated to assure usefulness and prevent obsolescence of these medical materials and equipment. (Goals 7–9)

Section 2: Sector Programs, Activities, and Tools

The Healthcare and Public Health Sector is a systems-based sector, influenced by the many-to-many relationships required to sustain the provision of care and disease prevention. Owners and operators partner in many ways to create a more sustainable system in the event of a disaster. Over the years, these partnering relationships have evolved into collaborative models, focusing on improved disease prevention, medical services, and patient care. While these are not formalized programs, such relationships are typically enacted through legal agreements and result in both reduced overhead and increased resiliency for the organizations. Sector programs and initiatives continue to evolve as CIKR emergency management planning requirements expand.

Currently, the Sector has placed great emphasis on protection of the supply chain and workforce sustainability. Supply chain processes experience significant vulnerabilities across the lifecycle. Production, delivery, storage, and distribution disruptions can occur as a result of seemingly insignificant events. The simple act of re-routing medical supplies from one locale to another can destabilize the supply chain. The loss of a specific manufacturer, distributor, port, transportation route, or international resource can have significant impacts on the acquisition of medical materials. Moreover, because the Sector has moved to just in time (JIT) delivery of supplies, there is considerable use of distributors who order in aggregate but ship based on individual facility demands. These business entities utilize sophisticated distribution software systems and processes, providing the capability to efficiently manage and use increased inventory amounts in circulation; however, due to the financial requirements, these organizations have little or no incentive to increase the on-hand inventories necessary to support unplanned response requirements, leaving the Sector vulnerable during a disaster. The complexities of the medical supply chain thus far have not been fully investigated. HPH objectives for the coming year include establishing R&D initiatives to analyze the supply chain and develop recommendations that will reduce the likelihood of a disruption.

The Sector Risk Profile and the 2007 National Annual Report recognize that the HPH Sector's workforce is its greatest asset, without which goods and services could not be provided. Still, it is notable that there is little acknowledgment of the risks imposed on workforce members during an event. The Sector, for its part, places significant emphasis on CIKR protection-related programs that are focused on biosurveillance; chemical, biological, radioactive, and nuclear (CBRN) preparedness and response initiatives; and protection of significant countermeasures and vaccine assets. Each of these has a component centered on protection of the workforce, both during response and during steady-state activities; however, additional work and initiatives must be put into place to effectively sustain the workforce.

The following subsections of this report highlight Sector programs and initiatives that support workforce, physical, and service continuity goals and that instill resiliency in the HPH Sector mission.

2.1 CIKR Protection Programs and Initiatives

As the Sector responsible for sustaining the essential functions of the Nation's healthcare and public health delivery system and for supporting effective emergency preparedness and response, Sector CIKR programs and initiatives are traditionally aligned with risk- and consequence-reduction activities relating to all hazards. Programs, initiatives, and tools are designed to reduce the negative impacts of known and likely threats, identify and reduce asset vulnerabilities, and/or provide other response-related capabilities for both sector-specific agencies (SSA) and non-SSA organizations. The desired outcomes of these programs include, but are not limited to, prevention of human casualties, assurance of the continued functioning of the healthcare and public health mission, efficiencies in emergency preparedness, response, recovery, consequence reduction, and the maintenance of public confidence in the healthcare and public health system.

Identified below are initiatives and programs within the HPH Sector that are predominantly within the Government domain. There exist many private sector programs at the subsector level; however, any private sector protective program reporting would need to be pursued in accordance with the requirements of the Paperwork Reduction Act (PRA). Thus, while the list of programs may seem limited, we believe that as the partnership matures, we will identify additional programs, initiatives, and tools over time.

Moreover, this section of the Sector Annual Report is intended to focus on those initiatives or programs that uniquely support this Sector, rather than the totality of programs in existence.

2.1.1 SCC Protective Programs, Initiatives, and Tools

Private sector CIKR programs play a predominant role in the resiliency of the HPH Sector. In healthcare, private sector owner/operators constitute approximately 85 percent of all Sector assets. Collaboration and business partnering among these entities has evolved over time due to shared financial risks, legislative requirements, and security and privacy issues. As a result, programs across subsector entities often share common principles, goals and objectives. Many programs have evolved over time in response to legislative mandates (Health Insurance Portability and Accountability Act [HIPAA] Privacy and Security Rules), as well as out of the need to ensure that resources, facilities, and technology are adequately protected and available in the event of a disaster. Below is a list of some private sector programs; this list is by no means intended to be exhaustive.

Regulated Medical Products. In an effort to avoid disruptions in business operations, many manufacturers of medical devices, pharmaceuticals, and biologicals have engaged in internal emergency preparedness activities and developed continuity of operations/contingency plans to manage internal and external emergencies. These activities may be driven primarily by individual business/financial priorities, rather than public health priorities. Private sector manufacturers have also, to varying degrees, implemented internal security processes and procedures to protect against loss of commercial confidential information and diversion of resources or manufactured product. Because these security, planning, and preparedness activities

are in large part implemented voluntarily and may not follow any established standards, it may be difficult to assess their adequacy or potential effectiveness against a range of threat scenarios.

Blood. The American Association of Blood Banks (AABB) Inter-organizational Task Force on Domestic Disasters and Acts of Terrorism coordinates Federal Government and private sector efforts to ensure that blood needs will be met in the event of a disaster. To assist facilities, the Task Force published a Disaster Operations Handbook, which is available on the AABB Web site at www.aabb.org. Members of the Task Force (including AABB, the American Red Cross, and Americas Blood Centers), along with representatives from the HHS and blood centers in the locally affected area, are in communication shortly after any disaster to assess blood needs and take action, if necessary, to ensure that these needs are met.

Association for Healthcare Resource and Materials Management (AHRMM). In early 2007, the AHRMM of the American Hospital Association published the *Disaster Preparedness Manual for Healthcare Materials Management Professionals*. This document is designed to be an easy-to-read manual that provides materials managers with an overview of the specific value and expanded leadership role they can play in the planning, mitigation, response, and recovery phases of the HPH Sector's disaster preparedness, beginning with their own facility. There are specific actions that materials managers can take in order to help their healthcare organization function more effectively during and after an event. These actions will not only prepare healthcare organizations to deal with disasters, but also help maintain/restore healthcare services to the community after the disaster.

Rx Response. Members of the U.S. private sector pharmaceutical supply system (manufacturers, distributors, and dispensers) and the American Red Cross have formed the Rx Response program to help ensure the continued supply of critical medications following a severe public health emergency. It represents a unique effort in today's business environment, with parties responsible for an entire industry sector working actively to safeguard supply system resilience during times of crisis through information sharing and communication. This effort provides a collaborative setting for members of the private sector pharmaceutical supply system to communicate clearly and directly with key government agencies (HHS, DHS, and State Public Health and Medical and Emergency Management agencies) about disaster-related resources, needs, and concerns.

ICERx.org (In Case of Emergency Prescription History Service). This is a public-service resource developed by the healthcare industry to help ensure continuity of quality care for the victims of future disasters. Once authenticated, licensed prescribers and pharmacists caring for patients in an emergency situation will be able to securely access a patient's medication history by logging onto www.ICERx.org. ICERx.org also provides caregivers with drug reference information and valuable clinical decision support tools, such as therapeutic duplication and interaction alerts.

The National Disaster Life Support Education Consortium™ (NDLSEC™). This is an unincorporated association jointly sponsored by the American Medical Association (AMA) and National Disaster Life Support Foundation™ (NDLSF™) and convened by the AMA. NDLSEC™ is a multidisciplinary consortium tasked to provide the requisite knowledge and

expertise for the regular review and critique of the National Disaster Life Support™ (NDLS™) courses. Its goal is to establish nationally recognized, standardized, and multidisciplinary curricula to train health professionals to respond to disasters and other public health emergencies in an effective and coordinated manner using an all-hazards approach.

The NDLSEC™ is a national coalition of professional organizations, academic centers, medical centers, government partners, and corporations that seek to further refine and re-define the science of medical disaster education and management. The association is responsible for providing program content input and recommendations for the NDLS™ training programs, including Advanced (ADLS™), Basic (BDLS®), Core (CDLS®), and additional courses under development.

2.1.2 GCC Protective Programs, Initiatives, and Tools

2.1.2.1 Department of Health and Human Services

Office of Assistant Secretary for Preparedness and Response (ASPR) Biomedical Advanced Research and Development Authority. The BARDA program is intended to promote the advanced development of medical countermeasures (MCMs) to protect Americans against the public health consequences of CBRN attacks and against the threat of emerging infectious diseases, including an influenza pandemic. Integral to this program is the Project Bioshield Act of 2004. This Act tasked DHS with determining, in consultation with other agencies, which current and emerging CBRN agents pose a national security threat to the United States. DHS develops a scenario, drawing upon scientific and technical knowledge of CBRN materials, experience of security partners, and government and academic subject matter experts (SMEs) to develop a plausible scenario of a bioterrorist attack using an agent under study. Scientific and technical gaps are identified, and additional information is collected to provide a higher fidelity of the potential threat. The assessment is then provided to HHS and BARDA for countermeasure development.

Office of Assistant Secretary for Preparedness and Response Hospital Preparedness Program. Through cooperative agreements and grant funding, the HPP mission is to improve surge capacity and enhance community and hospital preparedness for public health emergencies in defined geographic areas. In 2007, there were 62 awardees, which include the 50 States, New York City, Chicago, Los Angeles, the District of Columbia, and all U.S. territories. The program focuses on building the following capabilities to improve surge capacity: bed tracking, emergency healthcare personnel credentialing (e.g., Emergency System for Advance Registration of Volunteer Health Professionals), interoperable communications, fatality management, hospital evacuation, alternative care sites, pharmaceutical caches, personal protective equipment, and decontamination. HHS/ASPR offered an additional \$75 million in pandemic influenza supplemental funding from U.S. Department of Defense (DoD) appropriations to increase medical surge capability for States and localities. Over the past year, CIP has worked closely with the HPP program to facilitate integration of CIP requirements into grant guidance.

2.1.2.2 HHS Centers for Disease Control and Prevention Programs

Public Health Information Network. PHIN is the Centers for Disease Control and Prevention (CDC) vision for advancing fully capable and interoperable information systems in the many organizations that participate in public health. PHIN is a national initiative to implement a multi-organizational business and technical architecture for public health information systems. This program is well-developed and -utilized and continues to grow. PHIN elevates and integrates the capabilities of public health information systems across the wide variety of organizations that participate in public health and across the wide variety of interrelated public health functional needs.

Early Warning Infectious Disease Systems (EWIDS). EWIDS is a CDC-supported program that focuses on early detection, identification, and reporting of infectious diseases associated with both potential bioterror agents and other major threats to public health. EWIDS activities are intended to strengthen critical capacities in surveillance and epidemiology, laboratory capacity for biological agents, surveillance-related communication and information technology, and surveillance- and epidemiology-related education and training. Focused in 21 States bordering Canada or Mexico, four regional cooperatives have formed to jointly address shared concerns and programs. The HPH Sector has more work to do collaborating with border states and sharing their effective practices for dealing with workforce access, border closure issues, etc., in collaboration with the ASPR Office of Medicine and Science and Public Health (OMSPH), which facilitates this program.

Select Agent Program. CDC's Select Agent Program fulfills an important component of the Nations overall terrorism deterrence strategy by regulating the possession, use, and transfer of select biological agents and toxins (select agents) that could pose a severe threat to public health and safety. This activity ensures compliance with safety and security standards for possession, use, and transfer of select agents by providing guidance for implementing these standards and evaluating and inspecting entities. In collaboration with the U.S. Department of Agriculture's Animal and Plant Health Inspection Service and the U.S. Department of Justice's Criminal Justice Information Services, CDC regulates 41 biological agents and toxins. As of June 24, 2007, CDC maintained active registrations for 327 entities possessing select agents in the United States, including registrations by government agencies, academic institutions, corporations, companies, associations, and sole proprietorships (www.selectagents.gov/securitydoc.htm).

Cities Readiness Initiative. The Cities Readiness Initiative (CRI) is a federally funded effort to prepare major U.S. cities and metropolitan areas to effectively respond to a large-scale bioterrorist event, by dispensing antibiotics to the affected population within 48 hours. CRI jurisdictions were selected based on population, geographical location, and potential vulnerability to a bioterrorism threat. The CRI project started in 2004 with 21 metro areas, and as of 2006, CDC had increased the availability of Federal resources to 72 participating cities and metropolitan statistical areas.

As a result of CRI, communication and collaboration across State and local boundaries has been enhanced, improving the use of shared resources. Local and State planners have been able to

better identify capabilities, strengths, and shortcomings through preparedness planning and technical assistance reviews.

2.1.2.3 Department of Defense Health Affairs

The DoD CIP (DCIP) Program has overall responsibility for Military Health System CIKR protection issues, including identifying critical assets, monitoring the conduct of vulnerability assessments, coordinating consequence reduction to the DoD Health Sector mission in the event of a natural or man-made disaster, and recommending mitigating actions to provide mission assurance. The DoD Health Sector program is six years old and endeavors to enhance Sector resiliency by implementing the DoD Health Sector initiatives described below.

Asset Identification. The DoD's Health Sector process for identifying critical assets is guided by the Critical Asset Identification Process Manual produced by the Assistant Secretary of Defense for Homeland Defense and Americas Security Affairs. This process involves mission decomposition, required capability identification, and interdependency analysis of support to critical assets.

Vulnerability Assessment. This initiative allowed the DoD Health Sector to identify what organizations were performing vulnerability assessments on DoD Health Sector assets, where the information from those assessments is stored, and how the information is used. It also analyzed the tools used, frequency, and scope of vulnerability assessments currently being performed. The DoD Health Sector is working with mission and asset owners to close the gaps that exist in the current vulnerability assessment process.

Interdependency/Intradependency Analysis. The DoD Health Sector has analyzed its interdependencies with the other nine sectors of the DCIP program. It has also analyzed the intradependencies between the ten capability areas or functions that comprise the DoD Health Sector. This analysis helped the DoD Health Sector to identify where its dependencies are, both outside of and within the Sector. The results can be provided upon request.

DoD Health Sector Risk Management Program. This program incorporates the information gathered from the effort to identify critical assets, the vulnerability assessment study, and the interdependency/intradependency analysis to create a list of prioritized mitigating actions for senior leadership consideration.

Information Sharing and Information Management. Data sharing has the greatest potential to improve the Federal response to disasters, thereby providing a greater likelihood of mission success and consequence reduction. A coordinated effort to analyze and incorporate current knowledge management tools into an integrated information-sharing capability will provide the HPH Sector with greater flexibility to respond during natural or man-made disasters. Initiatives to improve the reporting capability of the Primary Health Assets Staging Tool system, which integrates data from the Joint Medical Asset Repository and the TRANSCOM (Transportation Command) Regulating and Command and Control Evacuation System (TRAC²ES) are under

way. These information-sharing mechanisms aggregate sector data and provide near real-time situational awareness for emergency readiness and response needs.

2.1.2.4 Department of Veterans Affairs Security Programs and Initiatives

Within the Veterans Health Administration (VHA), healthcare facilities receive all-hazards preparedness assistance from the Emergency Management Strategic Healthcare Group (EMSHG) through policy development and the work of Area Emergency Managers (field-based staff charged with providing assistance to facilities). In addition, VHA has several other CIKR protection programs.

Pandemic Influenza Planning. Pandemic influenza planning has focused on maintaining a safe and functioning workforce in the setting of a pandemic, through the use of personal protective equipment, antiviral stockpiling and distribution, and planning for vaccine distribution. In addition, VHA has conducted over 130 local, regional, and national tabletop exercises aimed at testing pandemic preparedness planning. After Action Reports from these tabletop exercises are currently being summarized to guide the next round of planning. A Department of Veterans Affairs (VA)-wide functional pandemic influenza exercise was planned for June 2008.

Healthcare Associated Infection Influenza Syndromic Surveillance (HAISS) System. VHA is seeking to leverage its advanced electronic medical records to establish a comprehensive electronic surveillance system for monitoring healthcare-associated infections and antibiotic resistance trends, as well as influenza and other emerging infectious diseases or syndromes potentially associated with bioterrorist activity, through a program known as the HAISS system.

As envisioned, the HAISS system will provide several categories of surveillance. Beginning with National Healthcare Safety Network (NHSN)-defined infections (including central line-associated blood stream infections, catheter-associated urinary tract infections, ventilator-associated pneumonia, and surgical site infections), the system will monitor influenza, influenza-like illness, and several syndrome groups (e.g., neurological, dermatologic.) characteristic of illness potentially caused by bioterrorist agents. The system will also enable surveillances of organisms of epidemiologic significance (including multi-drug resistant organisms and public health-reportable diseases) and provide decision support for antibiotic use.

Prototype development is currently under way. If beta testing is successful, the program will be rolled out to the thirteen VHA facilities currently participating in the CDC's NHSN, and it will be installed in an additional 18 facilities in fiscal year FY 2009.

Emergency Pharmaceutical Caches. VHA facilities throughout the Nation are equipped with an All Hazards Cache designed to provide the facility with up to 72 hours of supplies for a mass casualty event, to sustain the facility until arrival of supplies from the Strategic National Stockpile. An annual review process examines the components and mission of the cache to ensure that it is updated to reflect current threats under the all-hazards preparedness framework and make recommendations for changes to the cache inventory, training, and processes.

Decontamination Program. Each VHA facility has purchased and annually tests equipment for decontamination of patients who have been exposed to CBRN agents. The decontamination program is designed to protect the facility, staff, visitors, and other patients from contamination.

VA-DoD Contingency Plan. Under the VA-DoD Contingency Plan, VA serves as the healthcare backup to DoD during and immediately following a period of war or a period of national emergency declared by the president or the Congress that involves the use of armed forces in armed conflict. The VA-DoD Memorandum of Agreement (MOA) established a network of VA Primary Receiving Centers (PRCs) to receive large numbers of military casualties when required in such declared emergencies. This MOA also streamlines medical regulating processes, establishing a single entity in each of 87 major metropolitan areas of the country to manage patient reception operations, with VA assuming responsibility for 57 PRCs and DoD assuming responsibility for the rest.

Medical Emergency Radiological Response Team (MERRT). The MERRT comprises VHA healthcare professionals who can respond in the event of a nuclear accident or terrorist incident. Team members include physicians and health physicists from throughout the VA medical system. The purpose of the MERRT is to respond to the medical consequences resulting from either an accidental or deliberate release of nuclear material. The MERRT augments the staff of an existing institutional provider of care in receipt of casualties resulting from these radiological events by providing both technical advice and consultation to the professional medical staff of the facility, as well as direct medical care to the victims. Under the National Response Framework (NRF) and associated plans, VA provides MERRT support in the event of a radiological emergency at the request of the lead Federal agency or the affected State and local governments and supplements other Federal, State, and local government efforts.

Disaster Emergency Medical Personnel System (DEMPS). DEMPS is designed to provide a system whereby VHA personnel can register, in advance, for deployment in support of internal emergencies affecting the Department of Veterans Affairs, or external support as might be requested under various Federal plans and authorities, such as the NRF. The DEMPS provides augmentation of healthcare delivery and related services with physicians, nurses, nurse practitioners, physician assistants, pharmacists, pharmacy technicians, mental health counselors, and allied health personnel. The DEMPS also includes non-clinical staff for transportation, construction, safety, industrial hygiene and engineering, and other identified healthcare support professionals and ancillary personnel. The Emergency Reserve Corps (ERC) is a recent addition to DEMPS. Through the ERC, retired VHA staff can register for possible deployment to the field, or back-fill of deployed staff. Credentialing and privileging is kept current through their local facility.

Emergency Management Strategic Healthcare Group (Emergency Management Strategic Healthcare Group). EMSHG manages, coordinates and implements the emergency medical preparedness mission for the VHA and VA. EMSHG supports the VHA Comprehensive Emergency Management Program (CEMP) to ensure continuity of care for veterans, support the DoD during periods of war, and provide medical support under the NRF in response to national emergencies and disasters. EMSHG has recently begun a three-year project to perform a capabilities assessment of the entire VHA CEMP. The assessments include site visits to VA

medical centers and VHA regional offices and assessment of headquarters program offices. Through a collaborative process, both the current state of readiness and any gaps are identified, and effective security practices are shared across the system.

Emergency Management Academy (EMA). Education and training for the VHA CEMP is provided through the Emergency Management Academy. The EMA consists of a competency framework and curriculum that is available at <http://www1.va.gov/emshg/page.cfm?pg=122>. This content has been delivered face-to-face, and two Web-based courses currently exist. A certification program for Health System Leaders and Emergency Program Managers is being developed. The EMA curriculum addresses Emergency Management Standards and Guidance; Department of Homeland Security, Federal Emergency Management Agency regulations that address continuity of operations and the National Incident Management System (NIMS) compliance requirements; Occupational Safety and Health Administration regulations; the ASPR HPP benchmarks for bioterrorism preparedness; the Hospital Incident Command System; and the roles that individual VHA medical facilities, Veterans Integrated Service Networks, and the VHA Central Office play in the public health and medical service function of local and State emergency operations plans and the NRF.

2.1.2.5 Department of Homeland Security Programs

Buffer Zone Protection Program (BZPP). BZPP provides funding for the planning, equipping, and managing of protective actions necessary to protect, secure, and reduce vulnerabilities to CIKR sites. Currently, DHS BZPP provides support to identified States Tier 1 assets within each sector. Within the HPH Sector, two of the CDC main campuses and primary product suppliers have undergone the BZPP. The program has resulted in closer coordination with local law enforcement and a greater understanding among all participants of the potential threats that could be imposed against these facilities. Additional assessment of Tier 2 sites, including international sites, is expected in FY 2008.

Urban Area Security Initiative (UASI). The UASI Program funds address the unique planning, organization, equipment, training, and exercise needs of high-threat, high-density Urban Areas, and assist them in building an enhanced and sustainable capacity to prevent, protect against, respond to, and recover from acts of terrorism.

Urban Area Security Initiative Nonprofit Security Grant Program (NSGP). NSGP provides funding support for target-hardening activities to nonprofit organizations that are at high risk of terrorist attack. While this funding is provided specifically to high-risk nonprofit organizations, the program seeks to integrate nonprofit preparedness activities with broader State and local preparedness efforts. It is also designed to promote coordination and collaboration in emergency preparedness activities among public and private community representatives, State and local government agencies, and Citizen Corps Councils.

State Homeland Security Grant Program (SHSP). SHSP provides overall guidance for the Urban Area Security Initiative (UASI), Metropolitan Medical Response System (MMRS), and Citizen Corps Program (CCP) grants. The Homeland Security Grant Program (HSGP) supports the

implementation of State Homeland Security Strategies to address the identified planning, organization, equipment, training, and exercise needs for acts of terrorism and other catastrophic events. In addition, SHSP supports the implementation of the National Preparedness Guidelines, the NIMS, and the NRF. HSGP awards support the following public-health-related Target Capabilities: Responder Safety and Health; Emergency Public Safety and Security; Citizen Evacuation and Shelter-in-Place; Isolation and Quarantine; Emergency Triage and Pre-Hospital Treatment; Medical Surge; Medical Supplies Management and Distribution; Mass Prophylaxis; Mass Care (Sheltering, Feeding and Related Services); and Fatality Management. Planning activities under HSGP that support public health include activities intended to improve emergency medical service, public health, and behavioral health.

Metropolitan Medical Response System (MMRS). MMRS funds enable jurisdictions to further enhance and sustain a comprehensive regional mass casualty incident response capability during the first crucial hours of an incident. The program prepares jurisdictions for response to all-hazards mass casualty incidents, including terrorism, naturally occurring events, and large-scale hazardous materials incidents. Public health focus areas for the MMRS program include Medical Surge, Mass Prophylaxis, WMD/Hazardous Materials Response and Decontamination, Emergency Triage and Pre-Hospital Treatment, Medical Supplies Management and Distribution, and Fatality Management, as well as Isolation and Quarantine. Training supported by MMRS funds aims to strengthen medical surge, mass prophylaxis, triage and pre-hospital treatment, medical supplies management and distribution, mass care, and fatality management capabilities, as well as pandemic influenza preparedness and mass casualty response teams.

Homeland Security Grant Program Urban Areas Security Initiative. The Homeland Security Urban Areas Security Initiative Nonprofit Security Grant Program provides funding support for target-hardening activities to nonprofit organizations that are at high risk of international terrorist attack. While this funding is provided specifically to high-risk nonprofit organizations, the program seeks to integrate nonprofit preparedness activities with broader State, local, and tribal preparedness efforts. It is also designed to promote coordination and collaboration in emergency preparedness activities among public and private community representatives, State, local, and tribal government agencies, and Citizen Corps Councils.

Citizen Corps Program. The Citizen Corps mission is to bring community and government leaders together to coordinate the involvement of community members in emergency preparedness, planning, mitigation, response, and recovery. Public-health-related areas of the CCP include developing and implementing a plan or amending existing plans to achieve and expand citizen preparedness and participation; public education and outreach; alerts/warnings and emergency communications with the public; training programs for the public; citizen participation in exercises; volunteer programs and activities to support emergency responders; and involvement of citizens in surge capacity roles and responsibilities during an incident in alignment with the Emergency Support Functions and Annexes.

National Biosurveillance Integration System (NBIS). NBIS has been established to integrate biosurveillance information from all available sources. NBIS provides a single point within the Federal Government for the integration of these agency-specific biosurveillance reporting streams. DHS's vision for the national biosurveillance community is to provide a situational

awareness capability with a global view to protect the United States and its interests. Furthermore, the NBIS provides a homeland security-relevant Biosurveillance Common Operating Picture (BCOP) to senior leaders and partner agencies regarding natural disease outbreaks, accidental or intentional uses of biological agents, and emergent biohazards through the acquisition, integration, analysis, and dissemination of information from existing human disease, food, agriculture, water, meteorological, and environmental surveillance systems and relevant threat and intelligence information.

Federal Bureau of Investigation (FBI) Program. The FBI Critical National Asset (CNA) program was initiated to identify critical assets across all sectors that, in the event of a terrorist attack, would be single points of failure with respect to the Nation's infrastructure. CNAs are any single, non-redundant item, information, policy, plan, technology, person, or industry that, if stolen, modified, or manipulated by an adversary, would seriously threaten U.S. national or economic security. Each sector determines the criticality and specific definition of CNA by asking what is most important to the United States in the event that a Sector-Specific Asset is unavailable or rendered incapacitated. The National Counterintelligence Working Group (NCIWG) was designed to establish interagency partnerships at the senior executive level among the U.S. intelligence community (USIC), academia, industry, and defense contractors. Working through the NCIWG, the USIC has conveyed a consistent message with regard to its efforts to protect our national security. The NCIWG meets several times a year at FBI headquarters in Washington, D.C. HHS has recently been invited to participate in the NCIWG.

2.2 Coordination Groups and Security Partners

The National Infrastructure Protection Plan (NIPP) Partnership model provides a foundation of processes, procedures, and practical policies, vis-à-vis CIPAC and the Protected Critical Infrastructure Information program, that facilitates sector collaboration and instills cooperation across activities. In addition to this, requirements of the NIPP have resulted in strong bonds across sectors, creating a paradigm shift away from siloed approaches to security and consequence reduction. As a result, sectors have adopted the partnership model as a mechanism for sharing information, exchanging ideas, integrating into cross-sector work groups, and as a means for working in a cooperative manner in support of NIPP and other DHS mandates.

The HPH Sector GCC and private sector coordinating councils (SCC) have continued to meet over the course of the last year. They have each supported the SSA in reaching Sector goals and meeting Sector requirements.

2.2.1 HPH Sector Coordinating Council

The SCC in particular has expressed an interest in addressing response and preparedness issues beyond the sectors CIP mission and has engaged SSA leadership in this effort. Several Sector Coordinating Council (SCC) members are also members of the Institute of Medicine's Forum on Medical and Public Health Preparedness for Catastrophic Events. Preparedness is fundamental to

managing all hazards; thus, the SCC and others within the Sector have posited that infrastructure protection cannot be divorced from the more global issue of preparedness and response. This view is widely accepted and has been integrated into the concepts of Sector goals and priorities. It is further integrated into the Sector vision and mission statements.

SCC co-chairs continue in their roles for the second year, as do the leaders of the nine sub-councils: (1) Healthcare Personnel; (2) Insurers, Payers, and Health Maintenance Organizations (HMOs); (3) Information Technology; (4) Laboratories and Blood; (5) Mass Fatality Management Services; (6) Medical Materials Coordinating; (7) Medical Treatment; (8) Occupational Health; and (9) Pharmaceuticals and Biotechnology. In the summer of 2007, the SCC leadership put a moratorium in place on new members joining, noting that of the total members, only about 25 percent were committing time and effort to the CIP mission.

The SCC has worked with facilitators provided by DHS over the past several months to help focus and refine their goals and to determine their expectations of the SSA and GCC. Two areas that specific sub-councils have chosen to focus on this year are supply chain stockpiling policy and fatality industry challenges resulting from mass casualty events.

2.2.2 Meetings/Conference Sessions

The SCC leadership met independently several times over the past year, and it met jointly with the GCC in September and December 2007. In addition, SCC members participated on an SSA-initiated panel whose task was to collect sector network analysis data; they participated in conference calls with the SSA and GCC on tasks such as Tier 2 Criteria Development; 2007 Sector Annual Report development; SHIRA review sessions; Infrastructure Taxonomy Version 3; an expert panel session for HHS's Hospital Preparedness Program; and Sector-Specific Metrics, and they have supported select DHS initiatives such as the Risk Analysis Expert Panel Sessions and the IT Supply Chain in a Globalized Economy. Members are represented on the HPH Sector Joint Advisory Working Group (JAWG) for R&D and MS&A, which meets monthly, and is described at length in Section 3.

2.2.3 HPH Government Coordinating Council

The GCC comprises representatives from an array of Federal departments and agencies involved in healthcare and/or public health, various operating divisions within HHS, and organizations representing State, local, tribal, and territorial officials. This year, the SSA approached the State/territorial and tribal organizations serving on the GCC to assist in increasing the membership and participation of members in these categories, and it will continue to focus on enhancing their participation in the coming year. The GCC met twice, in-person in July 2007 and via teleconference in January 2008. GCC members have also actively participated in the tasks associated with CIP, including Tier 2 Criteria Development; the Cross-Sector Cyber Security Work Group; Development of the 2007 Sector Annual Report; Infrastructure Taxonomy Version 3; Sector Network Analysis; and Sector-Specific Metrics. GCC members are also broadly represented on the HPH R&D JAWG. The GCC has matured to the extent that in-person

meetings are no longer necessary to conduct routine business. Thus, in the foreseeable future, the GCC will conduct teleconference meetings whenever applicable. It should be noted that while GCC members participate in the development of deliverables and provide support to DHS data calls, consistent participation has yet to be achieved. Some agencies and organizations are very dedicated to the CIP and preparedness activities, while others lag behind. It is the goal of HHS as the SSA to achieve greater participation from the GCC membership, to identify meaningful initiatives where the value is commensurate to the time spent, and to ensure that work group activities are aligned with the Sector goals and priorities.

The HPH GCC also benefits from the participation of members from fellow SSAs and associations who sit on multiple sector GCCs, such as Food and Agriculture, Water, Energy, and the Emergency Services Sector. This dual security-partnership role gives members a unique view of the complex dependencies across sectors, provides a deeper understanding of the overarching NIPP framework and goals, and helps put the HPH Sector tasks and requirements into the larger context.

2.2.4 HPH Sector Exercises

The HPH Sector participated in two joint exercises this year with the Energy SSA and the U.S. Department of Energy (DOE). Exercises were developed collaboratively, leveraging resources from the HHS Training, Exercises, and Lessons Learned (TELL) Program and the CIP Program, as well as resources from Oak Ridge National Laboratory and the National Energy Technology Laboratory. The DOE-initiated exercise was intended to test DOE and HHS Emergency Operation Centers (EOCs) to assess and identify gaps in emergency operations communication protocols and practices currently being used. Objectives included:

- Identifying interdependencies between the Energy and HPH sectors, with the purpose of using this information to improve the understanding of each agency's relationships across their sectors.
- Increasing cooperative capabilities between the EOCs and emergency responders of DOE and HHS.
- Exercising the exchange of data and information between the agencies for improving the quality of each agency's situational assessment and to build the capability for DOE and HHS to work collaboratively during actual events.

In addition, the National Association of American Health Insurance Plans held a CDC-sponsored exercise in January 2008 called Preparing the Way: Pandemic Influenza Simulation for Healthcare, Industry and Public Sector Leaders. Participants in this two-day event included representatives of health insurance plans and payors; Federal, State, and local public health and emergency response officials; private sector representatives from various industries, including transportation, retail, financial services, and telecommunications; medical associations and provider organizations; and public relations/media experts. This diverse group engaged in a dynamic, participant-driven exercise and used their own knowledge, plans, and experiences in

responding to a simulated pandemic, resulting in new insights and recommendations on preparedness and response.

The simulation was designed to provide an opportunity for representatives from diverse sectors to explore the implications of an influenza pandemic and identify opportunities for collaboration and mitigation. Specific objectives included:

- Experience the potential realities of an influenza pandemic.
- Explore resource allocation strategies.
- Identify critical collaboration points among security partners.
- Elevate awareness and identify actions steps.

Lessons learned from the two-day simulation revealed several key insights:

- During an influenza pandemic, the broad impact across communities requires a strong local and State government response, with a more limited Federal Government implementation role.
- Despite the global spread and impact associated with an influenza pandemic, response most effectively occurs at a local level. Citizens require guidance, information, and resources at the community level — including locations of alternate care sites, schedules for trash pick-up, and school closings. Coordinating such a localized response requires State and local (i.e., city/borough/county) officials to serve in a critical decision-making and implementation capacity. While many may desire or expect active Federal Government involvement, the broad scope of the pandemic across the country, coupled with limited Federal resources, the nuances and particularities of individual State or community needs, and in some cases the authority of the local or State officials, suggests the Federal Government may best serve in a more limited implementation role and a more active advisory capacity. Providing guidance, disseminating information and lessons learned, and responding to specific resource or coordination requests (e.g., interstate commerce coordination for delivery of essential supplies) as transmitted via official formats through State governments effectively allows the Federal Government to support multiple jurisdictions. In order to assuage expectations of what the Federal Government versus the local governments can or cannot do during a pandemic, officials from all branches of government must work together to develop effective messaging to educate public, private, and civil sectors as part of pandemic preparedness planning.

2.2.5 Information Sharing

The SSA, SCC, and GCC continue to communicate via e-mail. The process has been very effective for communicating SSA- or DHS-sponsored initiatives; providing updates on current activities; and responding to requests for information.

The Sector is currently assessing the effectiveness of leveraging a Web portal to support working group activities, such as sector-specific metrics and the R&D JAWG. The SSA initiated multiple

attempts to use the Homeland Security Information Network (HSIN) for this purpose but met with resistance from users, who reported inadequate capabilities beyond offering an electronic information repository. The HPH R&D/MS&A JAWG, however, did achieve limited success in using the site, until the process of initiating new log-ons was halted. All in the Sector recognize the need for an information-sharing mechanism to receive threat and analysis data, and they would welcome timely receipt of notifications and threat information. It is anticipated that these features, as well as the chat capability, will be included in the new iteration of HSIN, and that the Sector will then be able to migrate back to HSIN.

The Sector is also highly reliant on conference calls and NetMeetings to support real-time communications and reporting. This form of information sharing has successfully facilitated development of Tier 2 criteria, the sector network analysis, Homeland Security Presidential Directive (HSPD) 21, development and review of the Sector Annual Report, communications on exercises, development of sector-specific metrics, and identification and refinement of Sector R&D/MS&A requirements.

2.2.6 Sector Achievements

To date, the HPH Sector has made considerable progress in collaboration, situational awareness, information sharing, and CIKR protection/response and recovery efforts. However, during development of the 2007 Sector Annual Report, it was recognized that the Sector had significant challenges to overcome in order to affect many of the implementation actions identified in the Sector-Specific Plan (SSP). As such, the HPH Sector will revise their implementation actions in a supplement to the SSP during 2008. With regard to achievements on Sector security goals, the predominant activities are aligned with initiatives to reduce the negative consequences of an event. The December 2007 joint SCC/GCC meeting was focused entirely on protecting the Sector workforce in the event of a pandemic influenza outbreak. In addition, officials of the HHS Hospital Preparedness grants program are working with the GCC chair to make protection of physical structures an identified requirement for eligibility.

While the focus of the SCC and GCC to this point has been somewhat limited to meeting the requirements associated with deliverables, the SCC leadership has expressed an interest in forming work groups around issues of concern to them. While the SCC and GCC have not yet worked together on key activities during an incident, they have worked with the SSA to support the development of tools and processes to improve incident management, such as HSPD 21. Furthermore, because of the wide diversity of HPH members, the Sector has not yet experienced widespread collaboration on protection and security goals beyond the deliverables required by DHS.

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Section 3: CIKR R&D Progress and Updated Capability Gaps

The HPH Sector has advanced its R&D and MS&A initiatives from the previous year's requirements. Capability gaps persist within the Sector, though a great deal of research does exist. In many cases, it has been noted that research falls short of developing useful tools (modeling, decision support, situational awareness) that can support protection and preparedness needs. The Sector remains focused on consequence reduction, preparedness, and improved response effectiveness, integrating protection concepts into the broader capabilities of emergency management planning.

In 2007, Sector requirements evolved with limited planning and collaboration sessions and were not necessarily vetted or validated against other Sector efforts. As a result, initial activities for 2008 included a detailed analysis of all research to identify common or duplicative efforts, minimizing the potential for redundancy in requirements. Additionally, the Sector JAWG for R&D and MS&A has established two primary capability themes to bring focus to the Sector's activities: Medical Surge and Workforce Sustainability.⁶ Both themes map to the current goals and priorities, and have been the foundation for formalizing objectives. It is recognized that the resulting capability gap statements may not be comprehensive, but at a minimum, they will bring to bear those requirements that are most pressing for the Sector to address.

In addition to the two primary capability themes, the Sector has identified other priority areas in need of R&D and/or MS&A, of which some are also noted as *Obstacles* in Section 5 of this report. Other gaps that have been identified remain from the previous year's report, because the requirements were not viewed as fulfilling a protection gap. The Sector's complex role in the provision of care and emergency response make it paramount that activities, tools, and programs serve the dual purpose of protection and response capabilities. Protection and response are compatible concepts, each derived from the need to produce stability and build resiliency into processes and technologies. The Sector will, therefore, resubmit several of the recommendations from 2007 that require further examination and that are not currently being addressed in other spheres. Additional clarity is provided in the formal gap statements in order to substantiate that these requirements are appropriate work for DHS. Requirements include, but are not limited to, those discussed below.

The areas in need of Modeling, Simulation, and Analysis are as follows:

- Medical Supply Chain
 - *Maintenance of stockpiles.* Conduct MS&A to examine the range of implications for States and smaller organizations of creating and maintaining stockpiles with a view to medical material storage, rotation of stock, and distribution.

⁶ Workforce Sustainability (Prevention and Protection) means maintaining the greatest number of fit personnel active in the field or available for deployment to the field as possible.

- Interdependency Analysis
 - *Sector Dependencies*. Identify interdependencies in terms of priority; alternate strategies for response to losing a key resource (e.g., water, energy, transportation, food); explore worst-case scenarios; conduct exercises that integrate the results of these analyses.
 - *Compound threats*. Examine compound threats, in which multiple events occur across localities or regions simultaneously. Study cascading consequences and interdependencies under such a scenario, with a focus on near-term economic impacts and loss of lives, as well as long-term impacts, including psychological and mission degradation.

The areas in need of R&D initiatives are as follows:

- Workforce Sustainability and Protection
 - Research methods to determine the psychological health of the workforce before, during, and after a crisis. There is an urgent need for R&D to protect the mental health of workers, preserving their willingness to enter an event zone, to trust in the efficacy of countermeasures, to enter a disaster zone without communications to the outside, and to protect their psychological health following response to traumatic events (post-event monitoring). Resulting research in this area can be leveraged to inform training and recruiting requirements, development of decision support tools, and the overall sustainability of the workforce.
 - Develop psychological tests to identify workers and volunteers most likely to follow through in a real event.
 - Study methods for engaging retired and non-practicing workers in emergency response; identify processes and mechanisms to make full use of their capabilities and define the scope of requirements necessary to enable them to function as fully as possible.
- Response and Recovery Capabilities — Interdependencies Analysis
 - Conduct research to assess planning requirements for long-term disruption in services. Focus on transportation, international medical supply chain, energy, water, and food.
 - Assess information-sharing requirements and communications mechanisms necessary to provide real-time data (situational awareness) on critical infrastructures involved in significant destructive events affecting the healthcare and public health system.

▪ Policy and Legal Frameworks

- Conduct policy research regarding existing logistics, mobilization, and distribution practices in the face of major disasters or disruptions. Focus on State and Federal laws and processes that influence the supply chain during a disaster.
- Research the effectiveness of temporary suspension of certain Federal, State, and local laws, rules, and regulations governing the conduct or practice of mass fatalities operations, including the recovery and storage of bodies, funeral directing, cemetery, and crematory operations.
- Research methods for implementing logistical, communication, vaccination, personal protective equipment (PPE), and liability-exemption requirements of volunteers during an emergency.

▪ Medical Supply Chain

- *Sole and limited sources of specialized medical material.* For devices and pharmaceuticals manufactured domestically, significant dependencies on raw materials or subcomponents from overseas sources persist. In some cases, the Nation is dependent on sole-source providers of medical materials for both international products and U.S.-based products. R&D is needed to develop more reliable processes for identifying, tracking, and anticipating single or primary source dependencies.⁷
- *Vulnerabilities in international supply chain manufacturing.* Manufacturing of certain classes of medical devices and pharmaceuticals, especially personal protective equipment/devices, has shifted from domestic sources to overseas sources, with nearly exclusive production of some devices in Asia. Both R&D and MS&A are needed to identify and assess the vulnerabilities in the international medical supply chain. The resulting analysis will be leveraged by the Sector to address gaps and develop activities to reduce the weaknesses in the supply chain.
- *U.S. manufacturing incentives.* Medical materials that are not typically produced in high volume or that are, by-and-large, produced outside of the United States may render the HPH Sector unable to fulfill its mission in the event of certain disasters, other national emergencies, or minor disruptions to international manufacturing. Examine incentives for the private sector to invest in manufacturing medical materials in the United States, in particular those products that require high availability and that are either not produced, or are produced in limited quantity, in the United States.
- *Medical devices sustainability.* Potential gaps exist between demand for key medical devices (i.e., devices that would be required to respond to a range of specific events) and the ability of the medical device manufacturing industry to meet such demands, as

⁷ There are many variables to primary source dependencies, including where an alternative resource is available to replace it, the percentage used on a daily basis, availability of raw materials to ramp up capacity, etc.

well as the availability of medically trained staff in sufficient number to use certain devices even if enough of them could be supplied.

- R&D is needed to examine other aspects of device development for applicability in disaster settings, considering such aspects as cost, standardization of product, compactness, portability, and ease of operation by those with limited skill.
 - Research is needed to determine which devices lay persons can be trained to use (e.g., beforehand versus on a just-in-time basis) and which ones require trained medical personnel, such as ventilators. Further research is then needed to determine the availability of these necessary personnel in a major all-hazards event and strategies for rapidly supplementing their numbers should the need arise.
 - Research is needed to examine alternative options for producing medical supplies. Focus should be given to developing new raw materials necessary in the production of essential medical supplies that are currently produced outside of the country. In identifying new resources, consideration should also be given to developing more durable materials to extend the life of a product, reducing manufacturing costs, and minimizing environmental impacts.
 - Modeling and simulation is needed to address the usage of limited resources. In the event of a supply chain disruption or medical surge, analysis is needed to address how to most effectively use limited resources and how to identify when one may be reaching the limited availability of resources. For those resources in greatest demand, the resulting data can be leveraged to inform both situational awareness during an event and the allocation of scarce resources in support of medical surge management.
- *Medical supply chain transportation and distribution.* Distribution goes through several different points, from major travel nodes to distribution at local levels, and is reliant on the stability of several other sectors. R&D is needed to examine methods for improving distribution of medical supplies during a crisis and to identify the most effective manner for tracking, transporting, and managing medical supplies from all points in the supply chain. The Federal sector has little knowledge of what tracking resources exist or their location. The private sector, on the other hand, has deep experience in tracking supplies. The government needs a way to work with private sector companies to affect distribution processes. Research is needed to develop and forge a process that accommodates disaster management and that supports the needs of all security partners.
- *JIT production.* In a JIT system, underutilized (excess) capacity is used instead of buffer inventories to hedge against problems that may arise. The Sector needs R&D to address the implications of JIT production patterns to include reduced inventory levels, increasing the inventory turnover rate, and underutilized capacity. This research may lead to identifying the need for mitigation strategies in the event that capacity of essential resources needs to be increased.

- Cyber Interdependencies
 - *Cyber Attacks — Cascading Consequences*. Nearly all of the 18 CIKRs have experienced cyber events that are exploited by the interconnections and interdependencies between sector assets, making it possible for a single sector to be targeted, and all other sectors to be significantly affected. Clearly, with the numerous threat vectors that may be utilized by a single hactivist or cyber terrorist, there is a compelling need to assess the complex and cascading consequences of attacks to IT infrastructure. It would be useful to understand and simulate cyber vulnerabilities that could result in worst-case scenarios: a cyber attack on biosurveillance systems, an attack on assets manufacturing essential medical supplies, on medical device systems, in a pharmaceutical environment, and perhaps even a cyber attack on a BSL-4 lab environment.

3.1 Progress

In September 2007, the HPH Sector formalized an R&D work group, officially referred to as the MS&A JAWG, to provide guidance on all matters related to Sector protection and preparedness requirements. In the initial stages, the Transportation Sector, which already had a well-established R&D program, provided significant support to define a framework for work group activities, develop processes to operationalize the R&D program, and infuse the work group with ideas around which R&D could be based. Transportation continues to be involved with the Sector, providing presentations, sharing knowledge on requirements analysis, and actively participating in proposed R&D and MS&A development sessions.

3.1.1 Roles and Responsibilities

The HPH Joint Advisory Work Group is a Federal Advisory Committee Act-exempt public/private partnership, composed of SCC and GCC members as well as academia, subject matter experts, and members of DHS S&T, as well as members of the National Infrastructure Simulation and Analysis Center (NISAC). It is the role of this group to identify Sector CIKR protection and preparedness R&D and MS&A needs for HPH. This group is also relied upon to make recommendations to other formal work groups on HPH R&D needs, for supporting the R&D technology transfer process, and for engaging project leads responsible for S&T-, NISAC-, or centers of excellence-sponsored initiatives. JAWG responsibilities include the following:

1. Developing mechanisms for assembling sector R&D/MS&A-related information on a continuing basis for use in the HPH Sector Annual Report and the National CIKR Protection R&D Plan.
2. Developing a comprehensive view across the Sector of relevant R&D efforts focused on CIKR protection/preparedness-related topics.

3. Identifying gaps in the known or presumed CIKR protection/preparedness-related problems facing the Sector.
4. Recommending programs to the White House Office of Science and Technology Policy annually to address those gaps, especially gaps that exist across multiple sectors.

The JAWG, which meets monthly, has been involved in writing the R&D chapter for the 2008 Annual Report; its membership has developed the requirements for the HPH R&D and MS&A agenda. The working group also facilitates coordination of requirements and needs common with other sectors, such as the Transportation Systems, Food and Agriculture, and Water sectors, that either influence or are influenced by healthcare and public health.

3.1.2 Sector R&D and MS&A Activities

For 2008, R&D and MS&A topics have been grouped within two main categories, Medical Surge and Workforce Sustainability, as determined by the HPH Executive Group of the JAWG. In order to identify priority requirements for R&D and MS&A, the Sector needed to first conduct a comprehensive inventory of research already under way in the Sector. This initial analysis was leveraged to validate requirements and to form the basis for new requirements. The Sector now has a deeper understanding regarding the direction of research across HPH and is well positioned to identify where gaps in capabilities persist, as well as where requirements were funded but there is still insufficient progress.

Below is a discussion of Sector themes, along with highlights of related ongoing initiatives.

3.1.3 Medical Surge Capability Initiatives

The Medical Surge Work Group met independently and within the JAWG forum six times over the past four months to refine the scope of medical surge and identify priority areas upon which to focus Sector research. Once priority areas were identified and defined, the JAWG then worked to formulate objectives for Sector protection/preparedness requirements. The process resulted in a focused examination of areas requiring study; a breakdown of each area into elements of research, development, or MS&A; and then a validation of those topics that were either not represented or that had limited visibility. Medical surge priorities were a significant component of 2007 requirements, reflecting the Sector's desire to integrate protection and emergency management concepts. The initiatives highlighted under this section reflect ongoing research and analysis, much of which has been undertaken by the Federal sector. It should be noted that this section represents limited research data. There are currently numerous ongoing R&D initiatives across the Sector.

3.1.3.1 Mass Casualty Response Requirements

The Agency for Healthcare Research and Quality (AHRQ) is undertaking many projects to improve the capability of HPH to respond to mass casualties. Highlights are described below:

- Developing a decision support tool for the use of hospital providers and/or administrators in deciding which patients may be discharged early and to which appropriate alternative healthcare site. This tool could be used to increase hospital beds available for victims of a mass casualty event.
- With funding provided by the HHS Office of the Assistant Secretary for Preparedness and Response, the AHRQ, working in collaboration with Denver Health, created a tool to cross-train nonrespiratory therapy healthcare professionals in basic respiratory care and ventilator management for use in the event of a public health emergency.
- Recently released tool to adapt community call centers for crisis support for home-based care and monitoring. This report describes the development, testing, and implementation of a model to enable community health call centers, such as poison control centers, nurse advice lines, and other hotlines, to support home-management and shelter-in-place approaches in certain mass casualty or health emergency events.
- Recommendations for expanding the capabilities of poison control centers, nurse advice lines, drug information centers, and health agency hotlines to assist persons at home or in public shelters in the event of public health emergencies, such as biological attacks or pandemic influenza.
- Development of a guide in support of mass casualty care: pre-hospital care, hospital and acute care, alternative care sites, palliative care, ethical issues, and legal considerations.
- AHRQ researchers at Denver Health developed a reporting tool for timely reporting of hospital bed status (HA_vBED™) for HHS.

3.1.3.2 Continuity of Operations

The Center for Preparedness and Catastrophic Response (PACER) is conducting research on informal networks that will also address planning for long-term disruption in service and identification of single-source dependencies.

3.1.3.3 Countermeasures Development

- The DHS Science and Technology Chem-Bio Integrated Product Team (IPT) and PACER are addressing hazardous substance countermeasure developments to enhance emergency response capabilities through projects that include detection systems for chemicals, bioassays, portable biodetectors, and others.

- AHRQ has developed a planning guide to help communities prepare for vaccine and drug dispensing in the event of a bioterrorism or other public health emergency.

3.1.3.4 Logistics

- PACER is conducting research on mobilization, logistics, and distribution patterns through a project titled Situational Awareness and Decision Making.

3.1.3.5 Long-Term Alternatives for Response

- AHRQ has developed an Emergency Preparedness Atlas that helps communities identify healthcare facilities that could be available to provide assistance in emergency situations, and it has published research on the potential role of nursing homes.
- AHRQ has developed a tool to help regional planners locate and rank potential alternative sites during a bioterrorism or other public health emergency, including re-opening shuttered hospitals to expand surge capacity needs.

3.1.3.6 Medical Materials

The NISAC and DHS HITRAC, through the Critical Foreign Dependencies Initiative, have been tasked to study the gap between demand for key medical devices and pharmaceuticals that are acquired from overseas and the ability of the U.S. domestic medical device and pharmaceuticals manufacturers to meet such demands in the event of a disruption to these supplies.

3.1.3.7 Cyber Initiatives

As with all sectors, threats continue to evolve as the Sector implements protection strategies to improve its overall security posture. In no other area is this more widely observed than across the cyber dimension. With the expanding cyber threat moving from nefarious acts to nation-state actors, even the domain of cyber has become more complex to understand or articulate.⁸ Few in the community can agree on an approach to cyber security that will improve the national level of information and mission assurance. Overall, a good deal is understood regarding the motivations for cyber aggression, yet it remains impossible to prevent the occurrence of such attacks, more important, it is recognized that intrusion into networks and systems may not be preventable. While HPH is not considered to be at risk of exposure from cyber threats, it does invest in technologies and strategies to improve information security and reduce organizational vulnerabilities related to cyber. Detailed analysis indicates that in the event of a cyber attack,

⁸ The National Military Strategy for Cyberspace Operations defines cyberspace as domain characterized by the use of electronics and the electromagnetic spectrum to store, modify, and exchange data via networked systems and associated physical infrastructures.

operations will continue in the Sector, leveraging alternative strategies to acquire supplies, access medical records, and complete transactions.

3.1.4 Biosurveillance: Workforce Sustainability

The JAWG decided at its March 2008 meeting to narrow the scope of its subgroup on Biosurveillance to the healthcare and public health workforce. Since that time, the JAWG has defined this theme as Workforce Sustainability. The working group further refined the requirements and objectives necessary to achieve workforce sustainability by conducting limited analysis to determine the ideal situation for protecting and sustaining the HPH workforce, and initial research priorities were drafted. The Sector security vision and mission statements, along with the Sector goals for Workforce Protection, have been adopted to help inform the focus of this theme.

Current R&D/MS&A activities that support biosurveillance and workforce sustainability are discussed below.

3.1.4.1 Real-Time Data Gathering and Decision Support Tools

The DHS Science and Technology (S&T) Infrastructure Protection IPT is researching the cascading effects and interdependencies of multi-threat vector attacks. Basic research to address these attacks — including visual analytics and physics-based simulation, data-intensive computing, privacy, and forensics — is also being conducted by S&T's Cyber Security R&D Group.

3.1.4.2 Biosensor Development

The DHS Science and Technology Chem-Bio IPT has multiple projects to develop improved CBRN sensors in urban areas, including Bio-Watch Generation 3 Detection Systems, Detect-to-Protect Triggers and Confirmers and Remote Sensors, and Autonomous Rapid Facility Chemical Agent monitors, among others. The Chem-Bio INNOVATION is researching Real Time Biological Detectors and Cell-All Ubiquitous Chem/Bio Detect, and PACER is studying the Detection and Surveillance of bioterrorism threats in the acute care setting.

The DHS Science and Technology Chem-Bio IPT is developing a portable biological agent detector for use at such locations as inspection stations, points of entry, commercial facilities, and other high-traffic venues to screen suspicious materials for the presence of biological agents. The detector is intended to identify at least 10 different biological agents with high sensitivity and specificity within 30 minutes or less.

3.1.4.3 Maximum Use of Volunteers

The Hospital Preparedness Program has created the Emergency System for Advance Registration of Volunteer Healthcare Professionals (ESAR-VHP), tasking all 50 States to create a secure database of volunteer health professionals who are interested in responding during an emergency.

3.1.5 Both Medical Surge and Biosurveillance/Workforce Sustainability

3.1.5.1 Protection of the HPH Workforce

- The DHS Science and Technology Incident Management IPT is researching the development of an all-hazard PPE system.
- The DHS Science and Technology Explosive Prevention IPT is researching vehicle-borne improvised explosive device (VBIED) detection and measures to defeat and mitigate blasts.
- PACER is researching methods to determine the psychological health of the workforce before, during, and after a crisis and also to identify workers and volunteers most likely to follow through in a real event.

3.1.5.2 Unknown Threats, Such as Bioengineered Diseases, New Chemicals

Boston Children's Hospital, with funding from the Health Resources and Services Administration (HRSA), has developed for AHRQ a training tool on procedures to decontaminate children after exposure to chemical and biological hazards.

3.1.5.3 Modeling and Simulation

Developing integrated models and technology to address the surge capacity of a region in real time is being undertaken through the DHS Science and Technology Incident Management IPT in a project called Simulation Based Incident Planning and Response and through CCI Basic Research in a Visual Analytics and Physics-based Simulation and the University of Washington's Pacific Rim simulation and supply cache optimization research.

AHRQ has developed a computer model designed to provide estimates of staff needed to operate a mass prophylaxis center, given specific population size and staff limitations of a jurisdiction, and a mass evacuation transportation model that estimates transportation resources needed to evacuate patients from healthcare facilities.

AHRQ also has developed models for mass casualty surge requirements for 8 of the 15 Homeland Security Council National Planning Scenarios, including two biological, three chemical, and two radiological/nuclear scenarios. Additional work is under way for pandemic influenza, pneumonic plague, improvised explosive devices, and food contamination.

3.2 Capability Gaps

The Sector's capability requirements, gaps, and priorities — focusing on changes from previous reports — have been incorporated into attachment C.

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Section 4: Funding Priorities

For information on funding priorities, please contact the Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response.

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Section 5: CIKR Protection: Security Practices and Obstacles

As described in the 2007 HPH Sector Annual Report, Sector programs and initiatives continue to evolve. Existing protective programs, specifically those that focus on terrorism and consequence reduction, and programs that reinforce response and recovery needs in the event of all hazards, must be flexible in their capabilities and extensible in reach. This year, the Sector focused on those programs that offered national, regional, or subsector benefits. Many of these practices are leveraged across this diverse system, having the flexibility to support both the Sector and cross-sector CIKR protection efforts. The CIKR security practices identified below span the Federal, public, and private sectors.

5.1 CIKR Protection Security Practices

The HPH Sector has many well-established CIKR protection security practices. The ones highlighted below reflect those that continue to serve the Sector in significant ways.

5.1.1 HHS Office of the Assistant Secretary for Preparedness and Response Programs

5.1.1.1 Biomedical Advanced Research and Development Authority

The BARDA program, (previously known as OPHEMC, for Office of Public Health and Emergency Medical Countermeasures) is responsible for providing coordination and expert advice regarding public health medical countermeasures late stage advanced development and procurement. Through the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE), BARDA also coordinates interagency efforts to define and prioritize requirements for public health medical emergency countermeasures, related research, modeling, simulation and analysis, and product development and procurement. BARDA also has responsibility for setting deployment and use strategies for medical countermeasures held in the Strategic National Stockpile.

Since 2007, BARDA has utilized its internal professional security cadre to develop and implement a dedicated security strategy that enhances the depth and quality of security services provided to BARDA contractors involved in the HHS CIKR program. BARDA's Program Protection Office (PPO) establishes security standards, provides guidance, and ensures compliance for BARDA CIKR throughout the complete life-cycle acquisition process of critical vaccines, diagnostics, and drugs acquired under Project Bio Shield (PBS) and the Pandemic Influenza and Emerging Infectious Diseases (PIEID) Program. BARDA PPO representatives provide advice and assistance in physical security, personnel security, information technology security, information security, and transportation security disciplines. In addition, BARDA PPO representatives coordinate with local, State, and Federal law enforcement and security personnel, including DHS's Protective Security Advisors (PSAs), to ensure a unified and localized

approach to contingency planning and security response. BARDA PPO has participated in DHS vulnerability assessments for Tier 1/Tier 2 public health resources and continues to work closely with DHS PSAs to ensure critical medical facilities, assets, programs, and resources are protected and able to respond to public health emergencies.

5.1.1.2 Hospital Preparedness Program

Through cooperative agreements and grant funding, HPP aims to improve surge capacity and enhance community and hospital preparedness for public health emergencies in defined geographic areas. In 2007, awardees included the 50 States, New York City, Chicago, Los Angeles, the District of Columbia, and all U.S. territories. The program focuses on building the following capabilities to improve surge capacity: bed tracking, emergency healthcare personnel credentialing (through ESAR-VHP), interoperable communications, fatality management, hospital evacuation, alternative care sites, pharmaceutical caches, PPE, and decontamination. HHS/ASPR offered an additional \$75 million in pandemic influenza supplemental funding (from DoD appropriations) to increase medical surge capability for States and localities. Over the past year, CIP has worked closely with the HPP program to facilitate integration of CIP activities into grant guidance.

5.1.1.3 HHS Training, Exercises, and Lessons Learned

HHS Operations leads TELL programs that are designed to ensure that the HHS's training, exercise, and evaluation program goals and objectives are achieved and that the Department has the capability to manage and coordinate its emergency preparedness and response missions. TELL has established a systematic approach for the improvement of the Departments emergency preparedness and response capabilities through training events, exercises, and evaluation. In the past year, CIP has worked very closely with TELL and integrated concepts of CIKR into HHS exercises to better plan and raise awareness of critical infrastructure requirements. TELL provides a framework and mechanisms for the Department to coordinate and improve its readiness capabilities across the spectrum of public health and medical emergencies. This includes effective all-hazards training; exercising within a robust and realistic domain; identifying lessons observed from training, events, exercises, and real-world contingencies; development of scenario-based playbooks; and implementing corrective action plans to improve the Departments emergency preparedness and response capabilities.

5.1.2 HHS Centers for Disease Control and Prevention Programs

5.1.2.1 Public Health Information Network

PHIN is CDC's vision for advancing fully capable and interoperable information systems in the many organizations that participate in public health. PHIN is a national initiative to implement a multi-organizational business and technical architecture for public health information systems.

This program is well developed, utilized, and continues to grow. PHIN elevates and integrates the capabilities of public health information systems across the wide variety of organizations that participate in public health and across the wide variety of interrelated public health functional needs.

5.1.2.2 Supported Early Warning Infectious Disease Systems

EWIDS is a CDC-supported program that focuses on early detection, identification, and reporting of infectious diseases associated with both potential bioterrorism agents and other major threats to public health. EWIDS activities are intended to strengthen critical capacities in surveillance and epidemiology, laboratory capacity for biological agents, surveillance-related communication and information technology, and surveillance/epidemiology-related education and training. Focused in 21 States bordering Canada or Mexico, four regional cooperatives have formed to jointly address shared concerns and programs. The Sector has more work to do collaborating with Border States and sharing their effective practices for dealing with workforce access, border closure issues, etc., in collaboration with the ASPR OMSPH, which facilitates this program.

5.1.2.3 Select Agent Program

CDC's Select Agent Program fulfills an important component of the Nations overall terrorism deterrence strategy by regulating the possession, use, and transfer of select biological agents and toxins (select agents) that could pose a severe threat to public health and safety. This activity ensures compliance with safety and security standards for possession, use, and transfer of select agents by providing guidance for implementing these standards and evaluating and inspecting entities. In collaboration with the U.S. Department of Agriculture Animal and Plant Health Inspection Service and the U.S. Department of Justice Criminal Justice Information Services, CDC regulates 41 biological agents and toxins. As of June 24, 2007, CDC maintained active registrations for 327 entities possessing select agents in the United States, including registrations by government agencies, academic institutions, corporations, companies, associations, and sole proprietorships (see www.selectagents.gov/securitydoc.htm).

5.1.2.4 Cities Readiness Initiative

The CRI is a federally funded effort to prepare major U.S. cities and metropolitan statistical areas (MSAs) to effectively respond to a large-scale bioterrorist event by dispensing antibiotics to the affected population within 48 hours. CRI jurisdictions were selected based on population, geographical location, and potential vulnerability to a bioterrorism threat. The CRI project started in 2004 with 21 metropolitan areas; as of 2006, CDC had increased the availability of Federal resources to 72 participating cities and MSAs.

As a result of CRI, communication and collaboration across State and local boundaries has been enhanced, optimizing use of shared resources. Local and State planners have been able to better

identify capabilities, strengths, and shortcomings through preparedness planning and technical assistance reviews.

5.1.3 DHS Programs

5.1.3.1 Homeland Security Grant Program

This grant program includes the Preventive Health and Health Services (PHHS) Block Grant operated by CDC. The CDC portion allows the flexibility to tailor prevention and health promotion programs to particular public health needs. States are expected to align their programs with Healthy People 2010 national health goals. Examples of funding areas include chronic disease prevention and control, emergency medical services, environmental health, infectious disease prevention and control, community-based education, injury prevention and control, and disease and risk factor surveillance. PHHS, while not typically viewed as a CIKR program, was included with the FY 2007 Homeland Security Grant Program. Though much of the money has been used for preventive health, enough has been spent on CIKR that DHS included it in its collection of HSGP programs (16 percent was spent on infrastructure and has been used to respond rapidly to emerging health threats in States).

5.1.3.2 Buffer Zone Protection Program

The BZPP provides funding for the planning, equipping, and managing of protective actions necessary to protect, secure, and reduce vulnerabilities to CIKR sites. Currently, DHS BZPP provides support to identified States Tier 1 assets within each sector. Within the HPH Sector, two of the CDC main campuses and primary product suppliers have undergone the BZPP. The program has resulted in closer coordination with local law enforcement and a greater understanding among all participants of the potential threats that could be imposed against these facilities. Additional assessment of Tier 2 sites, including international sites, is expected in FY 2008.

5.1.3.3 Urban Area Security Initiative Program

The UASI Program funds address the unique planning, organization, equipment, training, and exercise needs of high-threat, high-density urban areas and assist them in building an enhanced and sustainable capacity to prevent, protect against, respond to, and recover from acts of terrorism.

5.1.3.4 Urban Area Security Initiative Nonprofit Security Grant Program

The NSGP provides funding support for target-hardening activities to nonprofit organizations that are at high risk of terrorist attack. While this funding is provided specifically to high-risk

nonprofit organizations, the program seeks to integrate nonprofit preparedness activities with broader State and local preparedness efforts. It is also designed to promote coordination and collaboration in emergency preparedness activities among public and private community representatives, State and local government agencies, and Citizen Corps Councils.

5.1.3.5 State Homeland Security Grant Program

The SHSP provides overall guidance for the UASI, MMRS, and CCP grants. The HSGP supports the implementation of State Homeland Security Strategies to address the identified planning, organization, equipment, training, and exercise needs for acts of terrorism and other catastrophic events. In addition, SHSP supports the implementation of the National Preparedness Guidelines, the NIMS, and the NRF. HSGP awards support the following public-health-related target capabilities: Responder Safety and Health; Emergency Public Safety and Security; Citizen Evacuation and Shelter-in-Place; Isolation and Quarantine; Emergency Triage and Pre-Hospital Treatment; Medical Surge; Medical Supplies Management and Distribution; Mass Prophylaxis; Mass Care (Sheltering, Feeding and Related Services); and Fatality Management. Planning activities under HSGP that support public health include activities intended to improve emergency medical service, public health, and behavioral health.

5.1.3.6 Metropolitan Medical Response System

MMRS funds enable jurisdictions to further enhance and sustain a comprehensive regional mass casualty incident response capability during the first crucial hours of an incident. The program prepares jurisdictions for response to all-hazards mass casualty incidents, including terrorism, naturally occurring events, and large-scale hazardous materials incidents. Public health focus areas for the MMRS program include Medical Surge, Mass Prophylaxis, WMD/Hazardous Materials Response and Decontamination, Emergency Triage and Pre-Hospital Treatment, Medical Supplies Management and Distribution, and Fatality Management, as well as Isolation and Quarantine. Training supported by MMRS funds aims to strengthen medical surge, mass prophylaxis, triage and pre-hospital treatment, medical supplies management and distribution, mass care, and fatality management capabilities, as well as pandemic influenza preparedness and mass casualty response teams.

5.1.3.7 Homeland Security Grant Program Urban Areas Security Initiative

The Homeland Security Urban Areas Security Initiative Nonprofit Security Grant Program provides funding support for target-hardening activities to nonprofit organizations that are at high risk of international terrorist attack. While this funding is provided specifically to high-risk nonprofit organizations, the program seeks to integrate nonprofit preparedness activities with broader State, local, and tribal preparedness efforts. It is also designed to promote coordination and collaboration in emergency preparedness activities among public and private community representatives, State, local, and tribal government agencies, and Citizen Corps Councils.

5.1.3.8 Citizen Corps Program

The Citizen Corps mission is to bring community and government leaders together to coordinate the involvement of community members in emergency preparedness, planning, mitigation, response, and recovery. Public-health-related areas of the CCP include developing and implementing a plan or amending existing plans to achieve and expand citizen preparedness and participation; public education and outreach; alerts/warnings and emergency communications with the public; training programs for the public; citizen participation in exercises; volunteer programs; and activities to support emergency responders, as well as involvement of citizens in surge capacity roles and responsibilities during an incident, in alignment with the Emergency Support Functions and Annexes.

5.1.3.9 National Biosurveillance Integration System

The NBIS is intended to provide early detection and situational awareness of biological events of potential national consequence by acquiring, integrating, analyzing, and disseminating existing human, animal, plant, and environmental biosurveillance system data into a common operating picture, or BCOP, that represents a comprehensive depiction of the global biosurveillance security environment. Once fully developed, this system will enable early detection of infectious diseases, which is critical for mitigating the effects of outbreaks before they can spread to large portions of the population.

5.1.3.10 Federal Bureau of Investigation Program

The FBI Critical National Asset (CNA) program was initiated to identify critical assets across all sectors that, in the event of a terrorist attack, would be single points of failure with respect to the Nation's infrastructure. CNAs include any single, non-redundant item, information, policy, plan, technology, person, or industry that, if stolen, modified, or manipulated by an adversary, would seriously threaten U.S. national or economic security. Each sector determines the criticality and specific definition of CNA by asking what is most important to the United States in the event that a sector-specific asset is unavailable or rendered incapacitated. The National Counterintelligence Working Group was designed to establish interagency partnerships at the senior executive level among the U.S. intelligence community, academia, industry, and defense contractors. Working through the NCIWG, the USIC has conveyed a consistent message with regard to its efforts to protect our national security. The NCIWG meets several times a year at FBI headquarters in Washington, D.C. HHS has recently been invited to participate in the NCIWG.

5.1.3.11 National Biosurveillance Integration Systems

The NBIS has been established to integrate biosurveillance information from all available sources. NBIS provides a single point within the Federal Government for the integration of these agency-specific biosurveillance reporting streams. DHS's vision of the Nation's biosurveillance

community is to provide a situational awareness capability with a global view to protect the United States and its interests. Furthermore, the NBIS provides a homeland-security-relevant BCOP to senior leaders and partner agencies regarding natural disease outbreaks, accidental or intentional uses of biological agents, and emergent biohazards through the acquisition, integration, analysis, and dissemination of information from existing human disease, food, agriculture, water, meteorological, and environmental surveillance systems and relevant threat and intelligence information.

5.1.3.12 Protective Security Advisor Program

The mission of the PSA Program is to represent the Department of Homeland Security and the Office of Infrastructure Protection (IP) in local communities throughout the United States. PSAs work with State Homeland Security Advisor offices, serving as liaisons between DHS, the private sector, and Federal, State, territorial, local, and tribal entities; acting as DHSs on-site critical infrastructure and vulnerability assessment specialists. During natural disasters and contingency events, PSAs work in State and local Emergency Operations Centers (EOCs) and often provide expertise and support to the IP Infrastructure Liaison Cell, working to support the Principal Federal Official and Federal Coordinating Officer responsible for domestic incident management. In addition, PSAs are responsible for conducting assessments of State Tier 1 and Tier 2 assets and providing real-time information on facility significance and protective measures to facility owners and operators, as well as to State and local representatives.

One special aspect of the PSA Program is the ECIP (Enhanced Critical Infrastructure Protection) visits. The primary goals of the ECIP visits are to:

- Identify protective measures currently in place at Tier 1 and Tier 2 facilities, provide comparison across like assets, and track the implementation of any new protective measures into the future.
- Inform facility owners and operators of the importance of their facilities as an identified high-priority CIKR and the need to be vigilant in light of the ever-present threat of terrorism.
- Establish or enhance existing strong relationships between Tier 1 and Tier 2 facility owners and operators, DHS, and Federal, State, and local law enforcement personnel in order to:
 - Provide increased situational awareness at each facility.
 - Provide a constant Federal resource to facility owners and operators.

As of September 12, 2007, PSAs had conducted 121 ECIP visits.

5.1.3.13 Federal Emergency Management Agency (FEMA) Metropolitan Medical Response System

The FEMA MMRS program assists highly populated jurisdictions (124 through FY 2003) in developing plans, conducting training and exercises, and acquiring the pharmaceuticals and PPE needed to achieve the enhanced capability necessary to respond to a mass casualty event caused by a terrorist act involving WMD. This assistance supports the jurisdictions activities to increase their response capabilities during the first hours, which are crucial to lifesaving and population protection, with their own resources until significant external assistance can arrive.

5.1.4 Public/Private Partnerships

5.1.4.1 HPH Sector JAWG for R&D and MS&A Requirements

The HPH JAWG is a Federal Advisory Committee Act exempt public/private partnership, composed of SCC and GCC members as well as academia and subject matter experts. This group is chartered to provide guidance and recommendations to the Sector and to DHS on priority areas for R&D and MS&A to support protection, response, and recovery from all hazards. Recommendations range from the development of tools that support situational awareness to studies on policy and legal frameworks that enable more effective response and recovery activities. This group is also relied upon to make recommendations to other formal work groups on HPH R&D needs, as well as supporting the R&D technology transfer process. Efforts of this group are aligned with Sector goals and objectives and support the vision of a resilient, sustainable sector under all hazards.

5.1.5 Private Sector Programs

ICERx.org (In Case of Emergency Prescription History Service). This is a public-service resource developed by the healthcare industry to help ensure continuity of quality care for the victims of future disasters. Once authenticated, licensed prescribers and pharmacists caring for patients in an emergency situation will be able to securely access a patient's medication history by logging onto www.ICERx.org. ICERx.org also provides caregivers with drug reference information and valuable clinical decision support tools, such as therapeutic duplication and interaction alerts.

Rx Response. Members of the U.S. private sector pharmaceutical supply system (manufacturers, distributors, and dispensers) and the American Red Cross have formed the Rx Response program to help ensure the continued supply of critical medications following a severe public health emergency. It represents a unique effort in today's business environment, with parties responsible for an entire industry sector working actively to safeguard supply system resilience during times of crisis through information sharing and communication. This effort provides a collaborative setting for members of the private sector pharmaceutical supply system to communicate clearly and directly with key government agencies (HHS, DHS, and State Public

Health & Medical and Emergency Management Agencies) about disaster-related resources, needs, and concerns.

The National Disaster Life Support Education Consortium™ (NDLSEC™). This is an unincorporated association jointly sponsored by the American Medical Association (AMA) and National Disaster Life Support Foundation (NDLSF™) and convened by the AMA. NDLSEC™ is a multidisciplinary consortium tasked to provide the requisite knowledge and expertise for the regular review and critique of the National Disaster Life Support™ (NDLS™) courses. Its goal is to establish nationally recognized, standardized, and multidisciplinary curricula to train health professionals to respond to disasters and other public-health emergencies in an effective and coordinated manner, using an all-hazards approach.

5.1.6 Tools

5.1.6.1 DHS Common Vulnerability Guides

Common Vulnerabilities (CVs) are a series of documents provided by the DHS Protective Security Division that characterize and discuss the common vulnerabilities of selected infrastructures throughout all 17 CIKR sectors. The purpose of these documents is to share the valuable work done by DHS through its site visits within each sector. Information contained in the CVs is shared on a need-to-know basis with private sector industry owner/operators to improve protection of sector assets. For the HPH Sector, the following 11 CVs are available: ambulatory care, hospitals, medical laboratories, medical research facilities, medical supply manufacturing, pharmaceutical manufacturing, blood supply, end-of-life care facilities, State and local departments of health, and the Strategic National Stockpile. Companion documents to CVs – Potential Indicators of Threat and Protective Measures — provide further valuable information with which private sector owners/operators can plan protective security measures applicable to each DHS-evaluated infrastructure site. These documents are available through each States PSAs.

5.2 Obstacles

The Sector is recognized as the primary source of protection against, and intervention during, outbreaks from both infectious and non-infectious diseases. This Sector also serves as the principal response arm nationally and internationally for all hazards, placing workforce members directly in harms way in order to carry out the functions of healthcare and public health. As such, the intersection of protection and response in this Sector exists primarily as it relates to human resources, shifting protection requirements away from hard assets. This divergence from the traditional infrastructure planning and protection realm has generated challenges in HPH, requiring an approach to CIKR protection that is useful and meaningful to both the Sector and to the Department of Homeland Security. When the focus of protection is on hard assets and networks, the strategy generally relies on technologies and methods for physical security.

However, when the focus is on Sector functions and resources (e.g., workforce, medical materials, and supplies), strategies become more complex and require significantly more analysis to implement. As a result, the Sector necessarily applies a significant level of program investment, initiatives, and tools toward consequence reduction activities, mitigating harm to the workforce, limiting the loss of life, and sustaining the mission of healthcare and public health. Funding and grants for this Sector are generally central to such programs. Furthermore, HPH is an open, diverse system of nodes and relationships, the protection of which does not lend itself to siloed approaches to security or strategies that do not give significant consideration to response, recovery, and reconstitution in all hazards.

The path forward in healthcare and public health for achieving a resilient sector, with sustainable resources and functions, is significantly complex. Protecting and planning initiatives require broad information sharing free of impediments; policies and regulations that are structured to effect the necessary activities required during response and recovery; technologies and decision support tools that may be useful only during a disaster; programs that focus on harmonization between Federal, State, local, tribal, public, and private sector activities and requirements; strategies that are agile and consequence-reduction-focused in an all-hazards environment; and incentives to encourage prevention and protection to the extent applicable, as well as incentives to sustain the healthcare and public health workforce.

5.2.1 Policies, Regulatory Statutes, and Laws

Traditional risk management and emergency response programs are designed to consider compliance with Federal and State regulatory requirements, as well as legal issues. However, many such programs and initiatives are limited in the reach and flexibility that is desired in emergencies, resulting in impediments to the sustainability of healthcare and public health. Because the Sector operates as a system of interconnected capabilities and functions, each aspect of the Sector must be taken into account in the development of policies, statutes, and laws so as not to unnecessarily limit the activities that may be carried out to protect against or respond to an event (e.g., issues related to mass fatalities or the utilization of volunteers). Federal and State regulatory mandates require further review and attention for purposes of identifying impediments to effective planning for, responding to, and recovering from an event.

5.2.2 Financial Considerations

Protection programs, strategies, and technologies require significant investment and business case analysis in order to effectively implement them. Healthcare and public health must weigh the investment in new technologies that support bottom-line revenue generation and improved health outcomes against the investment in protection of the infrastructure. There exist few compelling arguments in healthcare for redirecting the limited financial resources away from increased revenues and high-quality healthcare, given what is known about the threat of terrorism to the Sector. For the HPH Sector, unlike most other CIKR sectors, spending on infrastructure protection does not offer a tangible return on investment, with the single possible exception of investment to protect medical supply chain manufacturing. Furthermore, with the

rising costs of healthcare, transferring the expense of an improved security posture to the consumer is not feasible. In other sectors, if the cost of the service increases commensurate to the investment in resiliency, consumers generally find a benefit, such as reduced electrical and telecomm outages during inclement weather. Consumers of healthcare, on the other hand, would not likely experience a difference in services but would be subject to increased insurance fees. If healthcare and public health is to implement some of the necessary consequence-reduction strategies and protection measures necessary to reduce risks related to threats from domestic and international terrorism, there need to be (1) incentives for owners and operators to make the investment; (2) a funding stream available to the Sector specific to infrastructure protection; (3) reduced costs and improved lifespan of security technologies; and (4) sustainable building materials to support the infrastructure.

5.2.3 Interdependency with Other Sectors

While sectors operate somewhat autonomously from the perspective of establishing and performing their missions, each sector has various dependencies on other sectors, such as Food and Agriculture, Water, Energy, Transportation Systems, and Emergency Services. These interrelationships are often not considered until an event of major proportions occurs. The resiliency of a single sector is bounded by cross-sector dependencies. Events such as Hurricane Katrina and September 11, 2001, have shown that we know very little about how these relationships interact. As a result, we have not adequately projected the requirements necessary to maintain the appropriate level of functionality during an event.

In a crisis, the HPH Sector must not only provide for the needs of victims, but also continue to meet the needs of those already under medical care. This becomes particularly challenging for the care of patients requiring substantial power, water, or support supplies when the consequences of an event extend to longer than a few hours or days. Sectors are now beginning to identify and account for interdependencies through vulnerability and consequence assessments. This, however, provides only limited analysis and does not fully support Sector planning and response requirements. Useful information would include the identification of interdependencies in terms of priority; alternative strategies for responding to an event, given the potential to lose one or more key resources (e.g., water, energy, transportation, and food); an exploration of worst-case scenarios to inform policymaking and emergency planning; and exercises that integrate the results of this analysis. Currently, the lack of informed data in this area presents obstacles to Sector protection and preparedness initiatives. Detailed simulation and analysis in this area would provide all sectors with a holistic view of interdependent relationships and processes, thus enabling national-level strategies to account for and mitigate risks related to interdependencies.

5.2.4 Programs and Initiatives to Protect Medical Manufacturing and Production Processes

The HPH Sector has significant investment in essential resources outside of the United States. Most of these resources are produced in China, Taiwan, and other parts of Asia. The ability to

ramp up capacity would require significant investment, time, and resources, making this an unlikely mitigation strategy during a disaster. Across nearly all sectors, there exists some degree of resource importation that is necessary to carry out services. In the HPH Sector, there are concerns regarding the ability to effectively track raw materials and individual components during the manufacturing, development, and transportation process. In many cases, the medical device is not wholly made in a single location, but various parts are prepared, then shipped to another location, integrated into a device, and finally exported to the United States. Tracking during this process would necessitate formal agreements and investment in technology and resources to implement them, as well as an analysis of what needs to be tracked, at what stage in production tracking should occur, and mitigation strategies to reduce the consequences of product shortfalls or contamination.

Unlike the investment to protect physical assets, protection of the supply chain requires rigid analysis to identify vulnerabilities related to raw materials; an examination of production processes, such as the movement between manufacturers during production; and an analysis of the political landscape, as well as environmental concerns and international laws, at a minimum. Analysis has yet to be undertaken to precisely measure the scope of vulnerability in the supply chain, particularly with respect to medical devices and manufacturing processes. Even if the vulnerabilities can be identified and measured, there will always be a dependency on the private sector for providing continuity of medical supply chain services.

Programs that are designed to protect processes or services are seldom effective without the participation of all security partners in the process. In the case that security partner involvement requires unfettered international support and investment, implementation of security programs or initiatives is impeded by nation-state self-interests and political relations between countries. In addition, oversight and management of such a program would necessitate an assessment of requirements for funding, resources, incentives to compel support from manufacturers, and a legal framework to ensure that the program is effective. Today, no such analysis exists; thus, implementing protection measures or programs is limited in effectiveness and in the ability to reduce risks to the medical supply chain.

5.2.5 Recognition that Prevention and Response Planning is Consistent with HSPD-7's Protection Focus

The Sector is limited in its effectiveness and ability to implement the appropriate security practices because its approach to CIP is often viewed as inconsistent with the requirements of HSPD-7. In no way is this better reflected than in disparities between HSPD-7, which focuses strictly on terrorism as the threat, and the NIPP, which builds on and is supportive of an all-hazards approach.⁹ It is important to recognize that many of the requirements for effective prevention and response have dual use as protection (decision support tools, sensors, vaccines, countermeasures). An all-hazards focus offers the potential for leaders to more effectively

⁹ Efforts to enhance the protection of CIKR from terrorist attacks should support all-hazards preparedness and response whenever possible, in accordance with the NIPP (2006), Section 1.6.4.

measure risk reduction and for development of integrated planning documents that reduce cascading consequences.

5.2.6 Impediments to Information Sharing

Information sharing is required for nearly every activity that is undertaken by DHS and the CIKR security partnership. From measuring effectiveness to sharing threat data to simply providing education, training, and awareness, information must be shared across all levels of government and the private sector. In fact, even technology transfer or the research that results in technology development does not easily find its way to those who could benefit most from the information, as a result of information-sharing impediments. As an example, a great deal of MS&A has been undertaken to support emergency preparedness and planning at the Federal level. Much of this work (either in the form of specific model outputs or through the use of the tools themselves) could be adapted for use by State, local, tribal, and/or private sector partners to enhance emergency response planning and inform policy. To date, there are very few formal mechanisms (e.g., tools, technology, and policies) in place for effectively and efficiently sharing this work with non-Federal sector constituents. A predominant impediment to this process is the need to ensure that the information remains protected throughout the information-sharing lifecycle. Similar impediments exist with NISAC activities and the private sectors information transfer. DHS is encouraged to ensure that the appropriate information-sharing mechanisms, policies, procedures, and processes will be implemented and readily accessible across private sector partners to facilitate broad, extensive use of analysis, threat data, exercise outcomes, and any other effective means for facilitating sector CIKR protection and preparedness efforts.

5.2.7 Concerns Related to Cyber Security

Information security and assurance exists at all levels of Sector protection efforts, either as a result of regulatory requirements (Federal Information Security Management Act of 2002/Health Insurance Portability and Accountability Act of 1996) or as a result of organizational security requirements. However, little focus is given at the Federal level to areas of cyber security that may be central to HPH. The Sector relies on threat and vulnerability data from vendors, Federal agencies, and security service providers, but other information exists that could help to convey nefarious intentions regarding the theft of protected health information, access to medical device systems, or denial of service attacks. Because cyber attacks on healthcare infrastructure offer little financial gain, the Sector does not perceive itself as a target of such an attack. DHS also has not identified HPH as a target of cyber crime. Given the focused attention on this particular area of CIKR protection, it would be useful to have DHS's National Cyber Security Division or the FBI provide a threat analysis and characterization for the Sector to better understand whether a healthcare-centric program is needed to support cyber security.

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Section 6: Program Effectiveness and Continuous Improvement

The HPH Sector continues to develop and implement CIKR protection and preparedness initiatives. Current programs and initiatives continue to mature, enabling the Sector to narrow its focus on those areas of CIKR protection and preparedness requiring the greatest degree of examination. In addition, the Sector partnership has seen significant progress over the past year, with Sector members engaging in such activities as the HSPD 21 review, Network Analysis, Cross-Sector Cyber Security Work Group activities, and development of the Sector Pandemic Flu Guides. The Sector has also made strides in its CIKR identification process, participation in national- and Sector-level exercises, analysis and development of R&D/MS&A requirements, and ability to measure progress.

6.1 CIKR Protection Mission Progress

A number of Sector CIKR programs and initiatives are in place to manage, mitigate, and reduce the negative consequences to the sector in the event of a disaster (figure 6-1). Programs and initiatives have evolved, and overall, the HPH Sector continues to make progress in CIKR protection and preparedness across all aspects of the NIPP risk management framework.

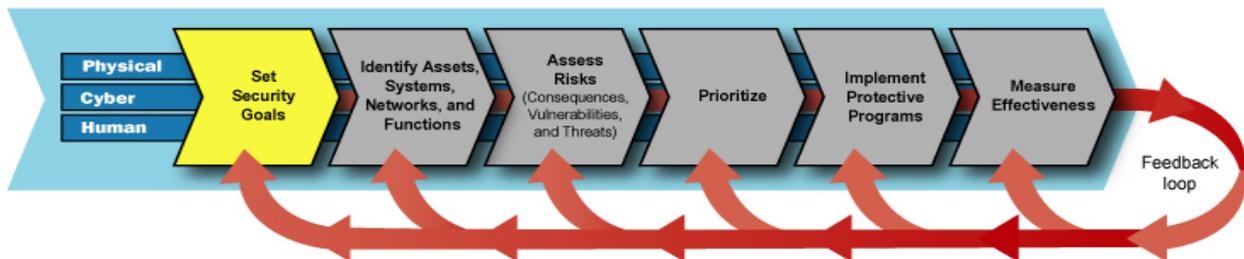


Figure 6-1: Continuous Improvement to Enhance Protection of CIKR¹⁰

6.1.1 Set Security Goals

The Sector reviews and updates its goals yearly to ensure consistency with the Sector vision and emerging concerns. Goals were revised this year to be more concise and achievable, but they generally reflect previous year's priority focus areas for Sector protection and preparedness requirements. Below are representative samples of initiatives that support the achievement of Sector workforce, physical, cyber, and service continuity goals:

- *Workforce Sustainability.* CDC, in partnership with other sectors and with extensive input from the HPH Sector, developed draft guidance for allocating and targeting pandemic influenza vaccine to better protect critical members of the workforce.

¹⁰ Source: DHS, 2006, National Infrastructure Protection Plan [http://www.dhs.gov/xlibrary/assets/NIPP_Plan.pdf].

- *Physical Security.* The HPP grant guidance has been updated over the past year to be inclusive of CIP language. The combined protection and preparedness language reflects the Sector's all-hazards focus and the desire to improve resiliency across assets and functions.
- *Cyber Security.* The Sector actively participates in the Cross-Sector Cyber Security Work Group, provides support to national-level cyber initiatives, and works with DHS's National Cyber Security Division, the intelligence community, and nationally recognized information security organizations to stay abreast of potential threats.
- *Service Continuity.* The Sector has initiated activities to more closely examine its international medical supply chain and gain an understanding of the impacts that a disruption would have on the Sector's ability to execute its mission. Over the next year, the Sector plans to analyze international medical manufacturing and distribution processes to identify vulnerabilities and protection requirements through R&D and MS&A initiatives (addressed in Section 3 of this report).

6.1.2 Identify Assets, Systems, Networks, and Functions

This past year, the Sector initiated a network analysis approach to identify critical assets, based on information in Lewis 2006.¹¹ The network analysis approach looks at the Sector as a system, not simply a collection of assets. The data collected through network analysis enable the Sector to identify interdependencies and points of failure within the healthcare system, leading to the discovery of CIKR that may not be readily apparent.

The Sector's inventory of assets has been used to plan for and respond to actual situations. It was recently used in support of the National Level Exercise 2008 and the TOPOFF (Top Officials) 4 Full-Scale Exercise. The Sector's inventory was also used to assist in preparations for Hurricane Dean (2007) and during the widespread California wildfires (2008). During these events, the inventory information proved valuable, enabling the identification of critical medical drug manufacturers in the path of the hurricane and HPH Sector assets affected by or in the path of the wildfires.

6.1.3 Assess Risks

The HPH Sector's risk management focus is on minimizing the negative consequences associated with an event. There are a number of specific protection efforts targeted at addressing risks within the Sector, including the following:

¹¹ Lewis, T.G., 2006, *Critical Infrastructure Protection in Homeland Security: Defending a Networked Nation*, John Wiley & Sons, Inc., Hoboken, N.J.

- CDC Public Health Information Network.
- Early Warning Infectious Disease System.
- Hospital Preparedness Program.
- CDC Public Health Preparedness Grants.
- Metropolitan Medical Response System.
- Training, Exercises, and Lessons Learned Programs.
- Biomedical Advanced Research and Development Authority Programs.
- ICERx.org Public-Service Resource.

The Sector will continue to align its protection efforts to manage its risks and reduce the negative consequences associated with all hazards.

6.1.4 Prioritize

The HPH Sector has a number of protection efforts focused on the Sector's significant assets, including:

- *Assessment Programs.* Assessment programs for evaluating the risk of significant assets exist within the DHS Protective Security Advisor Program, the HHS Regional Emergency Coordination Program, and the HHS Biomedical Advanced Research & Development Authority.
- *Select Agent Program.* CDC's Select Agent Program conducts inspections of registered entities to ensure that the facilities are compliant with the safety, security, training, and record-keeping provisions outlined in the select agent regulations.
- *Medically Necessary Products.* The FDA has programs in place to anticipate and minimize the negative consequences associated with shortages of drugs, biologics, and medical devices that might be induced by a disaster or regulatory action.

6.1.5 Implement Protective Programs

Sector programs, activities, and tools support achievement of the Sector's goals and mitigation of identified threats and consequences related to all hazards. The HPH Sector has collaborated with its security partners, including Energy, Water, Postal and Shipping, Food and Agriculture, Transportation, and Emergency Services Sectors, to implement holistic protection and preparedness initiatives. Several specific examples of collaboration with other sectors are provided below:

- *DOE Joint Exercise.* The HPH Sector partnered with the Energy Sector to conduct a joint exercise that tested the ability of the two sectors to share critical information during an event.

- *Sector-Specific Metrics Collaboration.* The HPH Sector actively participated in the development of Sector-specific metrics for the Water Sector. In return, the Water Sector has shared a number of work products, effective security practices, and lessons learned to inform and accelerate the HPH Sector's development of Sector-specific metrics.
- *R&D and MS&A Collaboration.* The Transportation Sector has shared effective security practices and lessons learned based on its work on R&D and MS&A. The HPH Sector, in turn, has shared information about its R&D and MS&A activities with the Water Sector. This collaboration has benefited all sectors and helped to ensure that the R&D and MS&A programs are aligned and not duplicative.
- *Pandemic Flu Exercises.* The HPH Sector has worked with the Postal and Shipping Sector to conduct pandemic flu exercises that tested the processes for the distribution of antiviral drugs and flu vaccine in the event of an outbreak.
- *Information Sharing.* The HPH Sector has worked with the Emergency Services and Food and Agriculture sectors to evaluate effective security practices around information-sharing mechanisms.
- *Risk Analysis Tool.* The HPH Sector actively participated in the requirements development and review process for the Water Sector's Risk Assessment Methodology for Water and the Vulnerability Self Assessment Tool.

6.1.6 Measure Effectiveness

The Sector has formed a CIPAC Work Group to develop Sector-specific metrics. This work group, which includes representatives from public and private organizations within the Sector, examined practices and lessons learned from the Water Sector's development of Sector-specific metrics, and it evaluated the value proposition from the perspective of organizations within the Sector that will be asked to submit data.

6.2 Path Forward

The HPH Sector strives to ensure mission effectiveness throughout the disaster management continuum. To date, the priority programs in the Sector focus predominantly on consequence-reduction strategies, with a view to service continuity. The Sector continues to evolve, working closely with protection partners to evaluate cross-sector dependencies, to integrate and customize activities in support of these relationships, and to standardize tools and technologies supporting protection and consequence-reduction needs common to all sectors. The path forward for HPH is highly dependent on private sector support and academia to guide the direction of programs, initiatives, and development of tools, as well as to foster broad information sharing across the sector. In addition, Sector activities and effectiveness will be directly influenced by the financial constraints already experienced in the Sector. Provided below is a list of major initiatives and

opportunities desired to successfully move the Sector forward. In addition, this section briefly discusses obstacles to achieving sustainability, resiliency, and reduced risks to assets, systems, networks, and functions. A fully detailed set of obstacles can be found in section 5 of this report.

6.2.1 Major Initiatives

The Sector has identified the following major initiatives:

- *Information Sharing.* Information sharing is the value proposition for attracting and retaining Sector security partners. The Sector will identify information-sharing issues and needs across mission requirements, and develop and integrate additional processes for sharing information across the Sector. Raising awareness of CIP within the Sector through outreach activities is critical to establishing an environment that fosters information sharing and collaboration.
- *Critical Infrastructure Identification.* The Sector recognizes the need to continue developing and refining processes to identify critical assets, systems, networks, and functions. The Sector will continue to examine its supply chain, focusing efforts on identifying critical dependencies and vulnerabilities related to international manufacturing. The Sector will increase the coordination of programs that identify medically necessary products, evaluate risks, and reduce vulnerabilities in the supply chain. Information gained from these efforts will inform the revisions of Tier 1 and Tier 2 criteria for the next year.
- *Integration with EP&R Programs.* The HPH Sector plays a critical role in preparing for and responding to the adverse health effects associated with all-hazards events. The HPH Sector will continue to look broadly across all sectors to understand their health-protection requirements and incorporate these needs into emergency preparedness and response (EP&R) programs and activities.
- *R&D and MS&A.* The Sector's Joint Advisory Work Group continues efforts on identifying gaps related to Medical Surge management and Workforce Sustainability. Initial analysis reveals a lack of decision support tools and MS&A capabilities in the context of medical surge response, and a lack of data related to the global manufacturing and distribution of medical devices, as gaps that must be addressed.

6.2.2 Obstacles

The Sector has identified the following obstacles:

- *Challenges in Maintaining Security Partnerships.* It is essential for the Sector to maintain the participation of security partners. To do this, owners and operators must see the value of participating in CIP efforts. The CIP Program, SCC, and GCC members intend to demonstrate this value by doing the following:

- Expanding owner-operator awareness of CIP through outreach activities, including participation in conferences and engagement with industry trade associations.
 - Making threat alerts and analysis and other valuable CIP information more accessible to owners and operators.
 - Providing educational opportunities to owners and operators, enabling them to better understand threats to the Sector and the associated consequences.
- *Complexity of the Supply Chain.* The supply chain for the Sector includes thousands of manufacturers and distributors from across the globe. The identification of critical nodes within the supply chain network will take considerable effort, but it is necessary to identify the Sector's critical infrastructure.

6.2.3 Continuous Improvement

The HPH Sector has made progress in establishing and implementing processes for continuous improvement. The Sector will continue to make advancements in this area through periodic revisions to goals, priorities, and objectives, and the development and implementation of Sector-specific metrics.

6.2.4 Goals, Priorities, and Objectives Revisions

The Sector has revised its goals, priorities, and objectives based on emerging concerns, gaps, and feedback from owners and operators within the Sector, as follows:

- *Goals.* The Sector refined and consolidated its goals to improve their clarity based on feedback from owners and operators. The revised goals are tightly focused and clearly articulate the Sector's need to sustain the workforce, secure physical and cyber infrastructure, and maintain business continuity prior to and during catastrophic events.
- *Priorities.* The Sector revised its priorities to more effectively support its goals. One of the Sector's revised priorities is to collaborate with R&D organizations to leverage and develop security technologies to better protect against cyber threats intended to disrupt or deny services. The Sector is very committed to enhancing cyber security.
- *Objectives.* The Sector has developed a revised set of objectives that align with Sector goals and form the basis to direct owner-operators CIKR protection efforts. These objectives serve as the foundation for Sector-specific metrics. In addition to the objectives supporting overall risk reduction, the Sector developed objectives specifically targeted at cyber security. These objectives call for improved mechanisms for detecting and preventing the rogue use of data and systems, as well as enhanced cyber incident response capability.

The Sector will continue to revise its goals, priorities, and objectives to set directions for improvements in its CIKR protection.

6.2.5 Sector-specific Metrics

The Sector recognizes the need to improve its ability to measure Sector resilience and program effectiveness. To that end, the Sector will develop and implement Sector-specific metrics. The Sector-specific Metrics Work Group is focusing its efforts on identifying existing metrics and data within the Sector that align with and support the Sector's goals, priorities, and objectives. The work group has taken this approach to avoid placing an additional reporting burden on Sector organizations. The work group will conduct research to identify these metrics, which will serve as the starting point for measuring the Sector's effectiveness in implementing CIKR protection.

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Attachment A: Acronym List

AABB	American Association of Blood Banks
AHRMM	Association for Healthcare Resource and Materials Management
AHRQ	Agency for Healthcare Research and Quality
AMA	American Medical Association
ASPR	Assistant Secretary for Preparedness and Response (HHS)
BARDA	Biomedical Advanced Research and Development Authority
BCOP	Biosurveillance Common Operating Picture
BZPP	Buffer Zone Protection Program
CBRN	chemical, biological, radiological, and nuclear
CCP	Citizen Corps Program
CDC	Centers for Disease Control and Prevention
CEMP	Comprehensive Emergency Management Program (Veterans Health Administration)
CIKR	Critical Infrastructure/Key Resources
CIP	Critical Infrastructure Protection
CIPAC	Critical Infrastructure Partnership Advisory Council
CNA	Critical National Asset Program
COOP	continuity of operations planning
CRI	Cities Readiness Initiative
CV	Common Vulnerability
DCIP	Department of Defense Critical Infrastructure Protection Program
DEMPS	Disaster Emergency Medical Personnel System
DHS	Department of Homeland Security
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
ECIP	Enhanced Critical Infrastructure Protection
EMA	Emergency Management Academy
EMSHG	Emergency Management Strategic Healthcare Group
EOC	Emergency Operations Center
EP&R	emergency preparedness and response
ERC	Emergency reserve Corps
ESAR-VHP	Emergency System Advanced Registration of Volunteer Health Professionals
EWIDS	Early Warning Infectious Disease Systems
FBI	Federal Bureau of Investigation
FDA	U.S. Food and Drug Administration
FEMA	Federal Emergency Management Agency
FY	fiscal year

GCC	Government Coordinating Council
HCAIIS	Healthcare Associated Infection Influenza Syndromic Surveillance
HHS	Department of Health and Human Services
HIPAA	Health Insurance Portability and Accountability Act
HITRAC	Homeland Infrastructure Threat and Risk Analysis Center
HMO	Health Maintenance Organization
HPH	Healthcare and Public Health
HPP	Hospital Preparedness Program
HRSA	Health Resources and Services Administration
HSGP	Homeland Security Grant Program
HSIN	Homeland Security Information Network
HSPD	Homeland Security Presidential Directive
IP	Office of Infrastructure Protection
IPT	Integrated Product Team
IT	information technology
IV	intravenous
JAWG	Joint Advisory Working Group
JIT	just in time
JMAR	Joint Medical Asset Repository
MCM	medical countermeasure
MERRT	Medical Emergency Radiological Response Team
MMRS	Metropolitan Medical Response System
MOA	Memorandum of Agreement
MS&A	modeling, simulation, and analysis
MSA	Metropolitan Statistical Area
NBIS	National Biosurveillance Integration System
NCIWG	National Counterintelligence Working Group
NDLS™	National Disaster Life Support™
NDLSEC™	National Disaster Life Support Education Consortium™
NDLSF™	National Disaster Life Support Foundation™
NHSN	National Healthcare Safety Network
NIH	National Institutes of Health
NIMS	National Incident Management System
NIPP	National Infrastructure Protection Plan
NISAC	National Infrastructure Simulation and Analysis Center
NRF	National Response Framework
NSGP	Nonprofit Security Grant Program
OMSPH	Office of Medicine, Science, and Public Health
OPHEMC	Office of Public Health Emergency Medical Countermeasures (now BARDA)

PACER	Center for Preparedness and Catastrophic Response
PBS	Project Bio Shield
PHEMCE	Public Health Emergency Medical Countermeasures Enterprise
PHHS	Preventive Health and Health Services (CDC)
PHIN	Public Health Information Network
PIEID	Pandemic Influenza and Emerging Infectious Diseases
PPE	personal protective equipment
PPO	Program Protection Office
PRA	Paperwork Reduction Act
PRC	Primary Receiving Center
PSA	Protective Security Advisor
PVC	polyvinyl chloride
R&D	research and development
S&T	Directorate of Science and Technology (DHS)
SCC	Sector Coordinating Council
SME	subject matter expert
SSA	Sector-Specific Agency
SHSP	State Homeland Security Grant Program
SSP	Sector-Specific Plan
TELL	Training, Exercises, and Lessons Learned
TRAC ² ES	TRANSCOM Regulating and Command and Control Evacuation System
TRANSCOM	Transportation Command
UASI	Urban Areas Security Initiative
USIC	U.S. intelligence community
VA	Department of Veterans Affairs
VBIED	vehicle-borne improvised explosive device
VHA	Veterans Health Administration
WMD	weapons of mass destruction

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Attachment B: Sector Objectives

Supporting Long-term Objective (All Hazards)	HPH Workforce Sustainability ^a	Physical Security ^b	Cyber Security ^c	Service Continuity ^d	Comments
1. Conduct regular risk assessments (including technical assessments) to identify and prioritize vulnerabilities.	X	X	X	X	Activities are tailored to the specific requirements within each goal
1-a. Develop, validate, and implement mitigation strategies to reduce the vulnerabilities associated with Sector assets and to improve Sector resiliency.	X	X	X	X	Activities are tailored to the specific requirements within each goal
1-b. Develop policies and procedures to enable the appropriate oversight of workforce members, volunteers, contractors, patients, vendors, and suppliers.	X				Policies/procedures for oversight should address how these individuals conduct themselves inside of a facility.
2. Implement processes for validating the identity of all workforce members; ensure that background checks on workforce members have been completed.	X	X	X	X	Special consideration may have to be given to those staff with access to sensitive systems, areas, or functions associated with facilities.

- ^a Proposed Workforce Sustainability Definition: Workforce Sustainability (Prevention and Protection) — The proactive monitoring (to detect infection/exposure) of healthcare and public health workforce members under all circumstances in order to protect against, ensure recovery from, and prevent exposure to or contamination resulting from all hazards. Workforce sustainability also encompasses the need to augment the workforce during significant events in order to sustain the capacity and reduce impacts to critical functions.
- ^b Physical Security is defined as policies, procedures, and processes employed to protect organizational assets and resources, including personnel, from physical actions or events that could cause serious losses or damage to an organization, agency, or institution. This includes protection from fire, natural disasters, burglary, theft, vandalism, and terrorism.
- ^c Cyber security includes preventing damage to, unauthorized use of, or exploitation of electronic information and communications systems and the information contained therein to ensure confidentiality, integrity, and availability. Cyber security also includes restoring electronic information and communications systems in the event of a terrorist attack or natural disaster. per NIPP 2006, Section 1.7.2.
- ^d Service continuity is the process of planning for and responding to potential threats or scenarios that may lead to disruption or degradation of Sector functions; service continuity includes policies, procedures, and activities to prevent or mitigate the impacts of an event and assure Sector resilience in the face of all hazards, to the extent practicable.

Supporting Long-term Objective (All Hazards)	HPH Workforce Sustainability ^a	Physical Security ^b	Cyber Security ^c	Service Continuity ^d	Comments
3. Develop and implement security training and awareness programs tailored to educate staff on organizational security and reporting requirements and the identification of potential threats to the Sector.	X	X	X	X	Activities are tailored to the specific requirements within each goal
4. Establish agreements to ensure timely response and message dissemination on potential threats to the Sector's assets.		X		X	
5. Integrate workforce sustainability into emergency management plans.	X			X	Activities are tailored to the specific requirements within each goal
5-a. Ensure that adequate plans are in place to provide workforce members the necessary resources, countermeasures, access to the worksite, sustenance, shelter, and, when applicable, provisions for family members during a disaster.	X	X		X	Accomplishing this objective will likely require support/participation from other sectors (Water, Food and Agriculture, Energy, Transportation Systems) The objective is intended to be addressed by all levels of Federal, State, local, tribal, public and private organizations, and should cover all workforce members.
5-b. Ensure that appropriate strategies and technologies are in place for minimizing risks facing families of the workforce during large-scale crises.	X			X	

^e Staff includes HPH workforce members, contractors, and volunteers.

Supporting Long-term Objective (All Hazards)	HPH Workforce Sustainability ^a	Physical Security ^b	Cyber Security ^c	Service Continuity ^d	Comments
6. Implement an incident response capability to identify, report on, investigate, and resolve cyber incidents.			X	X	
7. Implement requirements for systems failover, ^f and/or an alternate processing/treatment facility to continue the provision of Sector services.	X	X**	X	X	<p>Requirements for failover might include a hot site, warm site, redundant operations; provisions for data recovery, ensuring timely access to data back-ups; implementation at the alternate site of all packages and resources required to continue operations; an accounting of staff functions, and assigned staff for all critical functions; preparations to assure that staff has timely and safe access to alternate site locations; necessary supplies and resources at/delivered to the alternate site; and testing of any alternate processing/treatment facilities.</p> <p>** In the context of physical, you would need to account for space requirements for dislocated individuals.</p>
8. Establish policies and procedures for locking and limiting resource usage and accessibility (e.g., sensitive areas, systems, technologies, other) based on user roles and responsibilities.		X	X		Includes considerations for lab environments, pharmacy environments, research centers, data centers, etc.

^f Failover automatically and transparently redirects requests from a failed or down system to a backup system that mimics the operations of the primary system. This may occur with a warm or hot stand-by.

Supporting Long-term Objective (All Hazards)	HPH Workforce Sustainability ^a	Physical Security ^b	Cyber Security ^c	Service Continuity ^d	Comments
9. Implement auditing policies, procedures, and mechanisms to detect and prevent rogue use of organizational data and information systems.			X		
10. Implement, test, and update continuity of operations plans (COOP) yearly.	X	X	X	X	

Attachment C: Capability Gap Statements

Medical Surge Management

The ability to carry out HPH functions under extraordinary circumstances requires an integrated approach to managing resources, infrastructure, operations, and patients. The research priorities under Medical Surge Management seek to address the complexities of developing an integrated approach that is sustainable (to the degree practicable), is predictive, and offers a scientific basis for sound decisionmaking. The HPH communities recognize that as circumstances escalate and the continuum of response functions is maximized, the ability to provide care will be stressed, requiring a reduction in services and limiting the options for applying optimal clinical standards. Research into Medical Surge must take into consideration the changing modes of disaster — response vs. recovery — reflecting a focus on sustainability. In addition, each of the core components of medical surge should be analyzed to expose inaccurate assumptions and potential failures in the application of surge management. Aspects such as command, control and communications, resource needs and availability, standards of care, monitoring of the healthcare infrastructure, understanding the risk posture across escalation intensities, and the transition of operations from steady-state to crisis-state, are uniquely important to an integrated surge framework. An understanding of the conditions under which each aspect would be employed will require significant modeling and analysis.

The study of surge has progressed in recent years as a result of incidents such as Hurricane Katrina, yet the science and quantitative data to support decisionmaking across varying disaster scenarios is lacking. Developing and testing planning documents requires data that enable predictive analysis to support incident command structures and decisionmaking at the local level. Situational awareness and a common operating picture will form the basis for reliable, consistent, and actionable decisions. As a scenario evolves, sustainability of services and infrastructure must be achievable. For example, the ability to extend the triage model (diverting patients along with identifying facility diversion) to facilitate surge capacity needs will require knowledge of how alternative sites of care will be identified, what process will be implemented for diverting patient flow to these facilities, and how that process will be facilitated. Methods for effecting medical surge will need to promote access to care (and the awareness), taking into consideration the role of public health, the needs of underprivileged populations, and the necessary technologies or capabilities required for accessing care. There exist many opportunities for advancement in medical surge management, all of which can be realized through security partner collaboration and rigorous analysis. The capability gap statements identified in this 2008 Sector Annual Report reflect only a subset of priorities recommended for further examination.

Question	Response
Capability Gap Statement Tracking and Priority Number	2008-004–Healthcare and Public Health (HPH)
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	Informatics: Secure Information Exchange for Medical Surge Capacity Management
Goal/Objective to which Requirement Responds	<p>Service Continuity Goals:</p> <ul style="list-style-type: none"> ▪ Assure continued provision of essential services (e.g., patient care, public health) <ul style="list-style-type: none"> – Facilitate essential response and recovery functions both during and following an event. – Maintain the availability of sector-specific resources required to support the core functions of the sector (e.g., physicians, nurses, allied providers, hospital beds, laboratory services, pharmaceutical & surgical supplies, personal protective clothing – i.e., gloves, masks, etc.). – Maintain the availability of generic supporting services and resources upon which the sector is also dependent (e.g., water, power, food, telecommunications, transportation, fuel, security).
Theme	Analysis and Decision Support Systems; Response, Recovery, and Reconstitution Tools; Emerging Threats and Vulnerabilities Analysis Aids; Advanced Infrastructure Architecture
Threat Identification	All hazards resulting in and including Medical Surge
Gaps of Existing Capabilities	<p>There are many ongoing, collaborative efforts on informatics and information sharing research and development, including broad initiatives for Health Information Exchange (HIE), Electronic Health Records (EHR), Biosurveillance, and Interoperable Communications. However, the data elements and business processes are generally focused on tools supporting the provision of healthcare under normal conditions, including the sharing of subsets of patient data for routine public health purposes or outbreak detection. The Healthcare and Public Health Sector lacks the tools and standardized framework to efficiently and effectively provide situational awareness (SA) and information exchange in support of surge management during a major health event that could disrupt normal supply chains and workflow models. Furthermore, most current activity surrounding biosurveillance is focused on detecting an event with adverse implications for population health, leaving a gap in tools intended to detect a threat to the healthcare system itself. A threat to the essential resources required by the healthcare system, such as an unexpected shortage of critical supplies, could have a serious negative impact on the ability of the Sector to continue to deliver services even under normal conditions.</p> <p>HPH does not have the required interoperable tools that can be leveraged to provide situational awareness and decision support during an event. Data elements necessary to develop decision support tools conforming to medical surge implications require standardization, common resource-typing, and interoperable systems to share SA data.</p> <p>1. Research is necessary to determine how to leverage existing and developmental electronic data sources for rapid information sharing during an event, with a particular focus on deriving requisite SA data elements from routinely collected and reported health information. Gaps in essential data that cannot be derived from what is currently available* must be identified, and research into the most appropriate mechanisms to gather such data within the context of the normal workflow must be</p>

Question	Response
	<p>determined.</p> <p>2. Although a great deal of research has been done into techniques to share and transfer case and event information, including some pilot programs that seek to leverage data for multiple purposes, this work is far from fully realized. As this work progresses, it will be necessary to coordinate developmental work on specific SA gaps so as to assure the ultimate interoperability of the final system.</p> <p>3. Additionally, gaps must be addressed in the current policy and legal framework that do not allow for information and resource sharing to fulfill the requirements of SA.</p> <p>*In this context, available refers to the existence of the information or resource somewhere within the healthcare system. It does not assume that the information is available in the sense of immediately accessible when and where needed.</p>
<p>Description of Required Operational Capability</p>	<p>The establishment of technology and data standards to promote interoperability is a critical step toward increasing the national utility of data currently available. Required operational capabilities include:</p> <ul style="list-style-type: none"> ▪ The development of applicable tools that can interoperate with existing tools and systems. ▪ A framework that allows for easily accessible information sharing, event reporting, alerts, and notifications that will support situational awareness and response needs. ▪ Adoption of appropriate data and technology standards will help to reduce redundancy of efforts across the Sector and increase interoperability. <p>Interoperability and standardized data elements for rapid information sharing will increase Sector resiliency.</p>
<p>Identification of Existing Related Capabilities or Technology</p>	<p>The National Laboratory Response Network (LRN) incorporates the CDC LRN, FDA eLEXNET, Sentinel Labs, military and VA labs, as well as commercial labs; this type of collaboration can be further leveraged to handle other surge implications. There is work being done related to pharmaceuticals; CDC is developing a countermeasures inventory tracking system.</p> <p>The CDC Public Health Information Network (PHIN) integrates all of the reporting for public health use.</p>
<p>Identification of Possible Approaches/Solutions</p>	<p>Leverage SA frameworks used in DoD or ESS.</p> <ul style="list-style-type: none"> ▪ Identify and incorporate lessons learned from past events, and create a database of scenarios. ▪ Conduct peer review (e.g., conferences, mini-workshops). ▪ Ensure that this does not require additional reporting components/mandates. Leverage those already in existence.
<p>Capability Gap Statement Tracking and Priority Number</p>	<p>2008-001–Healthcare and Public Health</p>
<p>Is this submission an MS&A requirement?</p>	<p>Yes</p>
<p>Proposed Title of Requirement</p>	<p>Crisis Standards of Care</p>

Question	Response
Goal/Objective to which Requirement Responds	<p>Service Continuity Goals: Maintain the availability of supporting services and resources upon which the sector is dependent (e.g., water, power, food, transportation, fuel); continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions both during and following an event.</p> <p>Addresses NIPP overarching goal: ... to strengthen national preparedness, timely response, and rapid recovery in the event of an attack, natural disaster, or other emergency.</p>
Theme	Analysis and Decision Support Systems; Human and Social Issues; Response, Recovery, and Reconstitution Tools
Threat Identification	Threat: medical surge and medical supply chain disruptions.
Gaps of Existing Capabilities	<p>In the event of unprecedented medical surge, the degradation or destruction of resources, or impacts to the medical supply chain, the need to balance the utilization of scarce resources against the greatest likelihood of a positive outcome is brought to bear. The Sector does not currently have a decision support tool that can quickly analyze adjusted levels of resources, identify alternative resource types, and assess the greatest likelihood of a positive outcome; this could result in a delayed response time, as well as decisionmaking that is not founded on sound scientific principles, but rather is based upon subjective determinations. A refined decision support tool will allow for an effective resource allocation model and reduce the consequences of an overwhelmed healthcare system.</p>
Description of Required Operational Capability	<p>The desired outcome is a tool that has the capability to provide real-time decision support on the utilization of scarce resources. Such a tool should be able to leverage minimal data sets in the analysis and provide an appropriate predictive model for scarce resources that includes alternative resource strategies and estimated clinical outcomes. Development of this tool must consider that decisions are often made with limited information available.</p> <p>Examples of required capabilities:</p> <ul style="list-style-type: none"> ▪ Triggers to estimate resource depletion severity levels. ▪ Real-time analysis of estimated health outcomes. ▪ Data concerning real-time availability of resources, as well as the distribution network, location, timeframe, and volume. ▪ Scenario-based escalation data. <p>A decision support tool conforming to the requirements for decisionmaking related to scarce resources can also be leveraged for the needs of situational awareness.</p>
Identification of Existing Related Capabilities or Technology	Link to DoD efforts in this area.
Identification of Possible Approaches/Solutions	<p>Assess approaches identified by NORTHCOM.</p> <p>Review applicable studies from the Institute of Medicine (IOM forum on Preparedness and Catastrophic Events)</p> <p>Develop and implement education and training programs (engage professional organizations and Federal programs that may conduct this type of training already). Develop incentives (grants) for instituting training and educational awareness.</p>

Question	Response
Capability Gap Statement Tracking and Priority Number	2008-002–Healthcare and Public Health
Is this submission an MS&A requirement?	Yes
Proposed Title of Requirement	Situational Awareness: Incident Command Decision Support Tool
Goal/Objective to which Requirement Responds	Service Continuity Goal: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Analysis and Decision Support Systems; Human and Social Issues; Response, Recovery, and Reconstitution Tools
Threat Identification	<p>This tool is intended to mitigate the negative consequences of surge.</p> <p>In the event of unprecedented medical surge, the lack of a decision support tool to provide consistent, validated, and rapid decision support based on near real-time data elements can cause decision-makers to delay response during a disaster and/or make decisions based on inaccurate information. A refined decision support tool will allow for an effective incident command structure and reduce the consequences of medical surge.</p>
Gaps of Existing Capabilities	<p>Existing capabilities are not medically focused; thus, data elements and data aggregation capabilities do not support incident management in the context of healthcare and public health. Furthermore, the types of decisions that must be made, such as how to use scarce resources, anticipation of patient influx, alternative management strategies during surge, and other requirements to support situational awareness and incident command, are not tailored to the healthcare sector.</p> <p>Additional research is required to:</p> <ol style="list-style-type: none"> 1. Determine the appropriate and minimum data elements necessary during medical surge for rapid decision support. 2. Develop a dual use decision support tool. The Decision Support Tool must be leverageable across daily operations, as well as during a disaster (dual use concept) and must be easily adoptable (from a cost and technological perspective) by all healthcare and public health institutions.
Description of Required Operational Capability	<p>The desired outcome is a decision support tool that is (1) cost effective and (2) leverageable both during medical surge and steady state, with the (3) consideration that decisions must be made with limited information and limited time.</p> <p>The tool must be capable of medical surge analysis and provide reliable and consistent decision support to determine and manage surge capacity, manage such resources as medical countermeasures and human capital, and provide an appropriate incident command structure.</p> <p>Examples of data required:</p> <ul style="list-style-type: none"> ▪ Triggers to determine the level of response necessary based on surge severity levels estimated. ▪ Data concerning real-time availability of resources as well as the distribution network, location, timeframe, and volume. ▪ Policy, legal, and ethical considerations.

Question	Response
	Furthermore, a decision support tool conforming to the needs of situational awareness regarding medical surge can also be leveraged across other sectors for decision support and the development of incident command structures.
Identification of Existing Related Capabilities or Technology	Existing models developed by AHRQ for extracting data by making links among existing hospital and patient databases can be leveraged as methods for acquiring and determining the minimal data set necessary for enhanced situational awareness. PHIN should be leveraged. Refer to capabilities discussed under Informatics.
Identification of Possible Approaches/Solutions	The first step is to research the minimum data sets necessary for decision makers to make informed decisions. Once the data sets are determined, a tool must be developed that can analyze the data available at any given time and provide decision support. Furthermore, decision makers must be trained to maximize the utility of the tool, as well as to accept the decision-making protocol (i.e., the reliability of the tool is trusted by its users). There may be a need for multiple decision makers and decision-making tools.
Capability Gap Statement Tracking and Priority Number	2008-004–Healthcare and Public Health Sector
Is this submission an MS&A requirement?	Yes – it is both R&D and MS&A.
Proposed Title of Requirement	Health Systems Capacity Management
Goal/Objective to which Requirement Responds	Service Continuity Goal: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Analysis and Decision Support Systems; Human and Social Issues; Response, Recovery, and Reconstitution Tools
Threat Identification	Analysis supports the threat of surge.
Gaps of Existing Capabilities	The Sector does not currently have tools or the comprehensive analysis necessary to determine capacity capabilities of healthcare and public health facilities. Gaps exist in the following areas: <ol style="list-style-type: none"> 1. Ability to inventory State and regional capabilities, such as location and estimates of stockpiles, ability to quickly move medical materials, and general support capabilities. 2. Ability to estimate or model supply quantity requirements and resource utilization thresholds to conduct scenario-based analysis for estimating medical care capabilities under conditions of limited or degraded resources. 3. Ability to develop an effective supply chain management system to optimize resource allocation. 4. Ability to project cost estimates for various strategies to maintain or augment capacity.

Description of Required Operational Capability	<p>The desired outcome is a decision support tool that is (1) cost effective and (2) leverageable both during medical surge and steady state, with (3) the capability of integrating data from multiple sources at the Federal, State, and local levels.</p> <p>Such a tool must:</p> <ol style="list-style-type: none"> 1. Be useful in decision-making processes associated with capacity management across multiple thresholds. 2. Have agility and flexibility to conduct real-time analysis under evolving and unpredictable circumstances.
Question	Response
	<ol style="list-style-type: none"> 3. Interoperate easily with other situational awareness tools to generate a view 24 hours out, 72 hours out, and one week out. 4. Be capable of systematically predicting the most effective utilization of resources. <p>In addition, analysis should provide scientific data on resource utilization thresholds based on varying disaster scenarios. Analysis should also support optimization of supply chain processes.</p>
Identification of Existing Related Capabilities or Technology	<p>Existing models and tools developed under AHRQ for managing surge and The distribution of supplies from caches and stockpiles, as well as evidence-based tools that locate and rank potential alternative care sites, should be leveraged to support this requirement.^a In addition to this, project XTREME can be used to help inform this activity.</p>
Identification of Possible Approaches/Solutions	<p>Several approaches are identified and have been examined based on a report from the <i>Academic Emergency Medicine Journal</i>, November 2006 (www.aemi.org). These approaches should be further studied and applied to the Capacity Management Requirement.</p>

^a *Academic Emergency Medicine*, Vol. 13, No. 11, November 2006, pp. 1104–1105.

Workforce Sustainability

Healthcare and public health functions are a critical component to the Nation's stability. This Sector is wholly responsible for the health and safety of the population, for advances in research, for development of new medical technologies and preventive diagnostics, and for maintaining vigilance with regard to international events that may give rise to domestic outbreaks or require nationally significant policy changes. At all levels of the healthcare and public health continuum, the workforce is the single most critical asset, which the Nation can neither sustain nor afford to lose. The HPH Sector mission would fail without the support of the workforce to carry out disease management; disease surveillance, response, and recovery during an event; and the general provision of care. Currently, the Sector suffers a lack of sufficient resources to maintain a daily provision of care. Couple this lack with the potential for a disease outbreak or a disaster, and a diminishing workforce has the potential to bring the Sector mission to a halt.

The needs of the HPH Sector are different from those of other sectors, save those of emergency services. This workforce is exposed daily to disease, illness, biologics, environmental hazards, and so on. Often, they are exposed to the consequences of an event even before the event has been identified. They are, in short, on the front lines, risking their health and that of their families daily. It is this aspect of workforce sustainability that is peculiar to HPH and which the capability gap statements in this section are intended to address. The problem lies in the ability to maintain the necessary level of essential healthcare personnel at any given time to effectively carry out the HPH mission. The process by which the number of active HPH workers is sustained for the provision of care under all hazards (before, during, and following an event), including the effectiveness of institutions or organizations in which they work, has received little attention. Workforce protection during an event has received a great deal of attention, giving rise to training scenarios, research, and modeling. However, the task of protecting the workforce prior to an event, including protection of the family, is still not well studied. Moreover, few are asking the question as to which workforce members the Nation could afford to do without during an event in the context of medical and non-medical workers. Is there a need, for instance, to protect cafeteria workers in the same way as physicians and clinicians? Is the reality that anybody performing healthcare and public health functions (including volunteers, support staff) needs to be monitored, provided preventive countermeasures, and included in the totality of the HPH workforce model?

In addition, if sustainability of the workforce is regarded as a critical priority, then it is necessary to identify the total number of HPH workers (e.g., known trained, previously trained, not currently practicing, trained volunteers, untrained volunteers, and retirees), to know how and where to locate them and what type of training they have had, and to assess their psychological status in order to determine which individuals are best suited to support certain types of disasters. Methods by which the greatest numbers of effective workforce members can be sustained and maintained include:

- Monitoring (prior to, during, and after an incident).
- Protection in advance (prevention).

- Protection during (and after) an incident.
- Psychological training.
- Post-incident surveillance (e.g., post-Anthrax incidents, there was no surveying team to follow up with the known victims – how can events like this inform future R&D if there is no post-incident surveillance?).
- Analytic training and development to extend the reach of the skilled workforce and to improve the skill of those who are untrained or non-practicing.

R&D, MS&A, and increased collaboration among all HPH security partners are necessary to increase the capacity and sustain the HPH workforce, as well as to reduce vulnerabilities for a more resilient, sustainable Sector.

Question	Response
Capability Gap Statement Tracking and Priority Number	2008-003–Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	HPH Workforce Protection: Ensuring Mental Health Before, During, and After a Crisis
Goal/Objective to which Requirement Responds	<p>Sector Workforce Sustainability: Protect the Workforce from the harmful consequences of hazards that could compromise their health and safety while carrying out their HPH roles and responsibilities.</p> <p>Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.</p>
Theme	Response, Recovery, and Reconstitution Tools; Human and Social Issues
Threat Identification	<p>In the event of a disaster requiring members of the HPH workforce to mobilize, the mental health of each involved workforce member is crucial to response and recovery. If the psychological health of HPH workers prevents them from arriving at the scene of an event, arriving at work during an event, or trusting in the efficacy of countermeasures, mission degradation will ensue.</p> <p>Furthermore, the post-traumatic psychological health of HPH workers must also be addressed to maintain the readiness of the workforce to respond to a subsequent event and to ensure that their health is protected.</p>
Gaps in Existing Capabilities	<p>There is an urgent need for research to understand the underlying causes of mental health stresses that undermine the willingness of HPH workforce members to respond to a disaster, to trust in the efficacy of countermeasures, and to enter a disaster zone without communications to the outside.</p> <p>While there are some support programs targeted toward post-traumatic stress disorder for the military, there is a significant gap regarding the psychological health protection and maintenance for the HPH workforce prior to, during, and after a</p>

Question	Response
	<p>disaster.</p> <p>Research is needed to understand how to most effectively provide mental health support in the post-event environment in order to minimize the incidence of post-traumatic stress disorder.</p> <p>Furthermore, there is a lack of programs or methods designed to test the mental health of workers to determine the likelihood that an individual will respond in an emergency. There is an urgent need to develop mental health assessment strategies and tools.</p>
Description of Required Operational Capability	<p>The desired outcomes (evaluation, identification, mitigation) are:</p> <ol style="list-style-type: none"> 1. To establish a methodology to evaluate the psychological health of HPH essential-workforce members as well as volunteers to determine which individuals can be expected to participate in a response. 2. To provide psychological health evaluations and protections prior to, during, and after a traumatic event. 3. To promote the awareness and importance of mental health for individuals responding to a disaster. 4. To establish operational standards to improve mental health/psychological well-being before, during, and following a disaster. <p>Perhaps informs Psychological Resiliency Capability Gap Statement through R&D.</p>
Identification of Existing Related Capabilities or Technology	Research will facilitate the identification of related capabilities and/or technologies.
Identification of Possible Approaches/Solutions	Research will facilitate the identification of possible approaches and solutions.
Capability Gap Statement Tracking and Priority Number	2008-004–Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	HPH Workforce Sustainability: Mobilizing Inactive Workers during a Response
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Response, Recovery, and Reconstitution Tools; Human and Social Issues
Threat Identification	In the event of a disaster, there may be insufficient current HPH workforce members either willing or able to respond.
Gaps of Existing Capabilities	For the great numbers of HPH workforce members who are retired or no longer practicing, there exists no standard process for tracking their location and/or gaining contact information.
Description of Required Operational Capability	<p>The desired operational capabilities are:</p> <ol style="list-style-type: none"> 1. The ability to locate the retired and non-practicing HPH workforce in order to enhance sustainability during a crisis response. 2. The ability to quickly mobilize non-practicing and retired healthcare and public health workforce members.

Identification of Existing Related Capabilities or Technology	ESAR-VHP, while not standardized across all States and only addressing volunteers, would be ideal as a starting point to establish a framework for including retired and non-practicing HPH workers as valuable assets during a response. Expanding the capabilities of ESAR-VHP and Disaster Medical Assistance Team should be carried out by incorporating new requirements within these existing frameworks.
Question	Response
Identification of Possible Approaches/Solutions	Ensure that other ongoing initiatives in this area include retired and non-practicing workforce members.
Capability Gap Statement Tracking and Priority Number	2008-002–Healthcare and Public Health
Is this submission an MS&A requirement?	Yes
Proposed Title of Requirement	HPH Workforce Typing
Goal/Objective to which Requirement Responds	<p>Workforce Sustainability: Protect the workforce from the harmful consequences of hazards that could compromise their health and safety while carrying out their HPH roles and responsibilities.</p> <p>Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.</p>
Theme	Response, Recovery, and Reconstitution Tools; Human and Social Issues
Threat Identification	In the event of a disaster, there may be insufficient current workforce members either willing or able to respond.
Gaps of Existing Capabilities	<p>Once these individuals are located, pending their willingness to mobilize, there exists no standard method to assess skill sets and determine what, if any, training may be required, nor is there a policy or legal framework designed specifically to address retired or non-practicing HPH workers licensure and credentialing (e.g., liability waivers).</p> <p>An understanding of the existing related capabilities, both human and technical, designed to meet crisis contingencies.</p>
Description of Required Operational Capability	<p>The desired operational capabilities are:</p> <ol style="list-style-type: none"> 1. A standardized process for validating skill sets and determining the appropriate response roles. 2. Mechanisms/medical countermeasures to ensure their safety and protection. 3. Augmenting the response capability of the Sector by maximizing the effectiveness of the inactive workforce (training, exercising, education).
Identification of Existing Related Capabilities or Technology	<p>Some of the work regarding identifying credentialed and/or licensed individuals is currently being accomplished under ESAR-VHP; the requirements identified in this CGS may need to be carried over to ESAR-VHP to create a holistic solution.</p> <p>Leveraging data from State and regional credentialing or licensing board databases and National Disaster Medical System capabilities are other means of acquiring necessary data.</p> <p>Leverage data from licensing boards (for pharmacists, physicians, nurses, etc.).</p> <p>Credentialing and privileging are distinct hurdles; advance privileging is not possible; legal impediments to this capability regarding privileging have proven to be a significant factor in past crises.</p>

Question	Response
<p>Identification of Possible Approaches/Solutions</p>	<p>Metropolitan Medical Response System has suggested that some of the Good Samaritan Laws may need to be changed in order to effect this requirement. Some of these laws only allow for providing the service, but do not address liability. This issue is specific to the private sector.</p> <p>Leverage the existing guidance and methodologies used for the validation of volunteers.</p> <p>Possible methods for rapidly acquiring information regarding credentialed and/or licensed individuals: Consider services such as poison control centers and health insurance providers, where this type of information may be rapidly generated. Health insurance providers can also be instrumental in providing and collecting resource-typing information.</p>
<p>Capability Gap Statement Tracking and Priority Number</p>	<p>2008-001–Healthcare and Public Health</p>
<p>Is this submission an MS&A requirement?</p>	<p>No</p>
<p>Proposed Title of Requirement</p>	<p>Ensuring the Health and Safety of HPH Workers Families and Dependents</p>
<p>Goal/Objective to which Requirement Responds</p>	<p>Sector Workforce Sustainability Goal: Protect the workforce from the harmful consequences of hazards that could compromise their health and safety while carrying out their HPH roles and responsibilities. Under certain circumstances, the consideration of health and safety should be extended to the families of those workforce members required during emergency response and recovery functions.</p> <p>Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.</p>
<p>Theme</p>	<p>Response, Recovery, and Reconstitution Tools; Human and Social Issues</p>
<p>Threat Identification</p>	<ul style="list-style-type: none"> ▪ There may be insufficient HPH workforce members either willing or able to respond in a disaster, specifically due to their personal duties towards their families and dependents. This is perhaps the number one barrier to HPH workers responding during a disaster. ▪ Family members and dependents of HPH workforce members may be a vehicle for the transmission of infection. Thus, protecting them through medical countermeasures and by other means reduces the likelihood that a workforce member could become ill and unavailable during response and recovery activities.
<p>Gaps of Existing Capabilities</p>	<p>Little is known or understood about family social dynamics affecting workforce members during a crisis, which would have a direct impact on the ability both to limit the consequences of a disaster and to sustain response capabilities.</p>
<p>Description of Required Operational Capability</p>	<ol style="list-style-type: none"> 1. Determination of the triggers that might cause workforce members to remain with their families despite their medical responsibilities (leverage studies that have

	<p>already been done).</p> <p>2. Delineation of the scenarios that would cause the greatest impacts to workforce family members (physical or psychological).</p>
Question	Response
	<p>3. Identification of the requirements necessary to protect the health and safety of workforce family members during a disaster. This cannot be accomplished in isolation of the Sector; it must be integrated into the community response involving other sectors, such as the ESS.</p> <p>4. Requirements for the protection of workforce family members that could be integrated into a decision support tool.</p> <p>5. Identification of policies that can assist in effecting the protection of workforce family members.</p> <p>6. Awareness regarding workforce members as vectors for the [bilateral] transmission of infectious disease and sources of cross-contamination (e.g., radioactive agents) [arising within the family unit].</p>
Identification of Existing Related Capabilities or Technology	<p>A recent NIH study about pandemics and response revealed that one of the greatest impediments to a response are the lack of infection control precautions; two factors were identified as barriers to individuals attending work: (1) transportation and (2) child care (i.e., if schools close, there is even a greater potential for members of the workforce to remain at home to care for their children).</p>
Identification of Possible Approaches/Solutions	<p>Statistical research to determine what percentage of the HPH workforce has family members or dependents requiring support.</p> <p>Leveraging of other decision support tools by which to integrate the statistical analysis could be useful.</p> <p>Education of the HPH workforce and their families and dependents can also promote awareness of the threats related to transmission of infection, as well as the appropriate actions to take in a disaster to alleviate consequences.</p> <p>Any approach to addressing these issues needs to consider multiple scenarios. There may be some generic scenario data that can be leveraged, but ultimately, scenarios will need to be modeled.</p>

Medical Supply Chain Gaps

All healthcare and public health functions rely on the integrity of the supply chain. The range of medical materials includes both durable and non-durable goods, from radiological equipment to latex gloves; the diversity of the supply chain, involving the manufacturing, distribution, and consumption of medical materials, accounts for a high degree of gaps faced by the Sector in terms of protection and preparedness, as well as carrying out its mission during steady state. While domestic influences have raised visibility as a result of such things as contaminated products, what is perhaps less obvious is the upsurge of international interdependencies that currently exist in order to sustain domestic healthcare and public health operations on a daily basis. The diversion of medical material production to locations abroad may have cost-reduction benefits, but these dependencies render the supply chain, and therefore the Sector, vulnerable to events outside of U.S. control. Before these vulnerabilities can be addressed by preparedness and prevention initiatives, the vulnerabilities in the international supply chain must be identified and analyzed to determine the extent of their implications. The vulnerability of the international medical material supply chain poses a significant gap in existing capabilities, which can be addressed in a few intersecting ways: MS&A, a cost-benefit analysis to incentivize private industry to produce products locally, and research into the development of alternative resources for manufacturing essential medical materials.

Vulnerabilities exist in the domestic management of the medical material supply chain as well. Certain specialized medical materials are produced by sole or limited sources; in the event of a disruption in the production process of these materials, the Sector would have no way to compensate for the unavailability of the product(s). In addition, if the product is produced in a limited quantity, then a medical surge resulting in its rapid depletion would pose the critical issue of resource allocation. Transportation and distribution of medical supplies amount to another set of vulnerabilities: in order for medical supplies to reach their appropriate destinations, they travel through several nodes controlled by varying jurisdictions, owners and operators, and modes of transport. More important, there is little knowledge transfer or collaboration among Federal, State, and private partners to track the supplies and devices. Just-in-time production poses another vulnerability to the supply chain. While this model may be an effective business practice, it will undoubtedly increase the impacts of a disaster, resulting in a sudden increase in product depletion. JIT inventory production can also be said to influence stockpiling activities at medical facilities. Stockpile management requires continuous maintenance for storage, rotation of stock, and distribution: most patient care sites are not equipped or staffed to perform these necessary management functions.

R&D, MS&A, and increased collaboration among all HPH security partners are necessary to develop standardized and efficient processes for the management of the supply chain and to reduce vulnerabilities for a more resilient, sustainable Sector.

Question	Response
Capability Gap Statement Tracking and Priority Number	2008-001—Healthcare and Public Health
Is this submission an MS&A requirement?	Yes, and R&D.
Proposed Title of Requirement	Vulnerabilities in International Supply Chain Manufacturing
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Advanced Infrastructure Architecture; Emerging Threats and Vulnerabilities Analysis Aids
Threat Identification	The consequences of all hazards, including geopolitical considerations, resulting in the disruption of the international supply chain.
Gaps of Existing Capabilities	<p>The shift in the manufacturing of certain medical devices and pharmaceuticals from domestic to international manufacturers — for example, personal protective equipment and antimicrobials (some being exclusively produced in Asia and other international markets) — has rendered the Sector’s medical supply chain vulnerable to risks outside of U.S. control. There is an urgent need for R&D to more fully examine these vulnerabilities, including:</p> <ol style="list-style-type: none"> 1. Risks associated with transportation and distribution during the manufacturing/production process. 2. Risks resulting from the shortage of raw materials necessary to production. 3. Consequences resulting from surge or loss of a specific medical material. 4. Risks related to contamination of resources. <p>In addition, there is a current lack of scenario-based MS&A to inform planning and mitigation strategies.</p>
Description of Required Operational Capability	<p>The desired operational capabilities are:</p> <ol style="list-style-type: none"> 1. The ability to identify where vulnerabilities exist in the international medical supply chain. 2. The ability to assess vulnerabilities and leverage predictive analysis to understand the consequences of disruptions to the international medical supply chain and the impact on the provision of care domestically. 3. The ability to identify through scientific analysis specific resources for which there may be a need to develop alternative raw materials and production processes.
Identification of Existing Related Capabilities or Technology	FDA Center for Drug Evaluation and Research has a well-established program that is capable of identifying supply chain vulnerabilities for critical pharmaceutical products.
Identification of Possible Approaches/Solutions	
Capability Gap Statement Tracking and Priority Number	2008-003—Healthcare and Public Health
Is this submission an MS&A requirement?	Yes – R&D and MS&A.
Proposed Title of Requirement	Medical Device Sustainability
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both

	during and following an event
Question	Response
Theme	Advanced Infrastructure Architecture; Response, Recovery, and Reconstitution Tools
Threat Identification	The consequences resulting from a surge in or shortage of medical devices
Gaps of Existing Capabilities	<p>Potential gaps exist between demand for key medical devices (i.e., devices that would be required to respond to a range of specific events) and the ability of the medical device manufacturing industry to meet such demands:</p> <ul style="list-style-type: none"> ▪ R&D is needed to examine other aspects of device development for applicability in disaster settings, considering such aspects as (1) cost, (2) standardization of product, (3) compactness, (4) portability, and (5) ease of operation by those with limited skill. ▪ Research is needed to examine alternative options for producing such supplies as masks, gloves, syringes, etc. Focus should be given to developing new raw materials for such things as latex, PVC, and other resources necessary in the production of essential medical supplies that are currently produced outside of the United States. New resources should also give consideration to developing more durable materials to extend the life of a product, reducing manufacturing costs, and minimizing environmental impacts. ▪ Modeling and simulation is needed to address the usage of limited resources. In the event of a supply chain disruption or medical surge, analysis is needed to address how to most effectively use limited resources and how to identify that one may be reaching limited availability of resources. For those resources in greatest demand, the resulting data can be leveraged to inform situational awareness during an event and the allocation of scarce resources in support of medical surge management.
Description of Required Operational Capability	<p>The desired outcome is development that:</p> <ul style="list-style-type: none"> ▪ Promotes new raw materials for application in producing essential medical materials, with a focus on reuse, extended life of the raw material, reduced cost to produce, and shortened time to market. ▪ Generates cost-effective medical products for use by both patients and responders, specifically in disaster settings. ▪ Promotes manufacturing of essential medical resources within the United States. <p>Additional capabilities include scientific analysis of limited resources – understanding depletion rates, how to make the most effective use of limited resources, and identifying alternative resources that may be used.</p>
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	FDA may have some work in this area, along with HRSA.
Capability Gap Statement Tracking and Priority Number	2008-002–Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	Identifying Sole or Limited Source Dependencies
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.

Question	Response
Theme	Advanced Infrastructure Architecture; Emerging Threats and Vulnerabilities Analysis Aids
Threat Identification	The consequences of all hazards resulting in the disruption of the supply of raw materials or subcomponents of medical devices originating from single or primary source suppliers based both domestically and abroad.
Gaps of Existing Capabilities	<p>Many of the raw materials or subcomponents of medical devices upon which the Sector is dependent originate from single or primary sources; there is a need for research into the development of reliable and accurate processes to identify these dependencies:</p> <ol style="list-style-type: none"> 1. Vulnerabilities of the manufacturing processes. 2. Dependencies in terms of accessing, transporting, and developing raw materials. 3. Planning protocols in the event that raw materials are inaccessible; 4. Transportation and tracking capabilities to ensure reduced likelihood of resource loss. 5. The ability to adequately anticipate and monitor single or primary source dependencies.
Description of Required Operational Capability	<p>The desired operational capabilities are:</p> <ol style="list-style-type: none"> 1. The ability to identify and monitor current single or primary source dependencies. 2. Ability to scientifically address vulnerabilities. 3. The ability to track the supply and locations of certain raw materials and subcomponents of medical devices. 4. The ability to anticipate new single or primary source dependencies.
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	
Capability Gap Statement Tracking and Priority Number	2008-007–Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	U.S. Manufacturing Incentives
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event; prevent or mitigate the consequences of disruptions to the supply chain or diversion of supplies that could significantly impair continuity of Sector operations.
Theme	Advanced Infrastructure Architecture; Protection and Prevention Systems; Response, Recovery, and Reconstitution Tools
Threat Identification	The consequences of all hazards resulting in disruptions to the supply chain, attributed to the lack of domestic or sufficient domestic production of certain types of medical material.
Gaps of Existing Capabilities	There is a significant lack of incentives for private industry to manufacture certain medical materials that are either not produced in high volume, or not produced at all, in the United States. Because most of these products (some of which are required in high availability by the Sector) are manufactured internationally, the Sector is rendered vulnerable to disruptions in supply chain arising both domestically and

	internationally.
Question	Response
Description of Required Operational Capability	The desired operational capability is rigid analysis for identifying incentives (grants, tax benefits, other) for the private sector to begin to invest in the domestic manufacturing and production of medical materials — in particular, those products that are used in high volume but are either produced in limited quantity or not produced at all in the United States (e.g., medical gloves, syringes, IV tubing).
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	
Capability Gap Statement Tracking and Priority Number	2008-008—Healthcare and Public Health
Is this submission an MS&A requirement?	Yes; both R&D and MS&A will be required.
Proposed Title of Requirement	JIT Inventory Production
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event; prevent or mitigate the consequences of disruptions to the supply chain or diversion of supplies that could significantly impair continuity of Sector operations.
Theme	Advanced Infrastructure Architecture; Protection and Prevention Systems; Response, Recovery, and Reconstitution Tools
Threat Identification	The consequences of all-hazards resulting in the rapid depletion of critical medical supplies.
Gaps of Existing Capabilities	<p>There is a need for R&D to address underutilized production and distribution capacity in order to plan for increased resource needs.</p> <p>In facilities preparing for unanticipated surges, buffer inventories may exist; however, increased stockpiling results in new difficulties, such as expired resources and lack of inventory turnover, potentially rendering products unusable.</p> <p>There currently exist few to no strategies for mitigation in the event that capacity of essential resources needs to be increased.</p>
Description of Required Operational Capability	<p>The desired operational capabilities are:</p> <ol style="list-style-type: none"> 1. The ability to increase JIT capacity to required or anticipated levels. 2. Scientific data on the immediate and long-term impacts resulting from a loss of certain medical materials that are essential to the provision of care, such as gloves, masks, syringes, etc. 3. Empirical data on the cost to expand production of certain resources beyond just-in-time inventory standards. 4. Development of incentives for private sector manufacturers and distributors to plan for increased resource needs — in particular, increases in the demand for essential medical supplies.
Identification of Existing Related Capabilities or Technology	Leverage DoD analysis and standards for incentives and increased inventory capacity requirements.
Identification of Possible	

Approaches/Solutions	
Question	Response
Capability Gap Statement Tracking and Priority Number	2008-004–Healthcare and Public Health
Is this submission an MS&A requirement?	Yes
Proposed Title of Requirement	Medical Supply Chain: Maintenance of Stockpiles
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event; prevent or mitigate the consequences of disruptions to the supply chain or diversion of supplies that could significantly impair continuity of Sector operations.
Theme	Advanced Infrastructure Architecture; Response, Recovery, and Reconstitution Tools; Protection and Prevention Systems
Threat Identification	The consequences of all hazards resulting in the rapid depletion of medical supplies.
Gaps of Existing Capabilities	<p>There is a growing concern among the healthcare and public health community that inventory supply levels currently maintained by hospitals will not support surge in the event of a disaster. Many hospitals and hospital systems have begun expanding their inventories to accommodate increased demands, as well as to alleviate the impacts of potential supply shortages. However, hospitals have limited storage capabilities, and many cannot meet capacity increases beyond a week. In addition, inventory management may prove to be resource-intensive, with the need to effectively rotate stock to manage expiration, the need to ensure a controlled environment, and the limited capability to track inventory.</p> <p>There are currently incomplete data and a lack of analysis regarding the cost impacts of stockpiling (e.g., costs of ordering, managing, and maintaining the added medical materials; the costs of human capital), as well as information regarding requirements for training and education.</p> <p>Modeling and simulation is necessary to examine the range of implications on States and smaller organizations for creating and maintaining stockpiles efficiently.</p>
Description of Required Operational Capability	<p>The desired analysis would provide:</p> <ol style="list-style-type: none"> 1. Empirical data from MS&A to measure the efficacy of stockpiling, to measure the risks, and to develop planning guidance. 2. The ability to make recommendations regarding requirements, limitations, costs, risks, and effective management of stockpiles.
Identification of Existing Related Capabilities or Technology	Some tools may exist as a component of predicting mass prophylaxis requirements. AHRQ has worked on some modeling tools to support effective surge management.
Identification of Possible Approaches/Solutions	
Capability Gap Statement Tracking and Priority Number	2008-005–Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of	Medical Supply Chain Transportation and Distribution

Requirement	
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Question	Response
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event; prevent or mitigate the consequences of disruptions to the supply chain or diversion of supplies that could significantly impair continuity of Sector operations.
Theme	Advanced Infrastructure Architecture; Response, Recovery, and Reconstitution Tools; Protection and Prevention Systems
Threat Identification	The consequences of all hazards resulting in the need for rapid distribution of essential medical supplies.
Gaps of Existing Capabilities	<p>Distribution of medical supplies goes through several different nodes before the supplies reach their final destinations. There is a need for a methodology to improve the distribution of medical supplies during a crisis to ensure that supplies are diverted appropriately to their required destination.</p> <p>R&D is necessary to identify the most efficient processes for tracking, transporting, and managing medical supplies, spanning all nodes, distribution points, and end points.</p> <p>While the private sector has developed several methods for the effective tracking of medical supplies from transportation through to distribution, the Federal sector has little knowledge of what tracking resources exist or how to leverage them. There is an urgent need for Federal/private collaboration to develop a process that accommodates disaster supply chain management that engages and supports the needs of all security partners.</p>
Description of Required Operational Capability	<p>The desired operational capabilities are:</p> <ol style="list-style-type: none"> 1. The ability to identify all points/nodes in the distribution and transport of medical supplies. 2. The ability to track, transport, and manage medical supplies efficiently and in a standardized manner during a crisis. 3. The ability to develop alternative distribution processes in the event of a disaster. 4. Development of a Federal solution to aggregate, identify, and inform the effective distribution of medical supplies during an event. 5. A mechanism for fostering collaboration among all security partners, including Federal and private, to operationalize a consistent methodology and processes for tracking, transporting, and managing medical supplies during a crisis.
Identification of Existing Related Capabilities or Technology	The MM Capability Gap Working Group is currently working on a distribution tracking mechanism that will be applicable to almost all medical supplies.
Identification of Possible Approaches/Solutions	
Capability Gap Statement Tracking and Priority Number	2008-006--Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	Supply Chain Logistics: Policy and Legal Coordination

Question	Response
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event; prevent or mitigate the consequences of disruptions to the supply chain or diversion of supplies that could significantly impair continuity of Sector operations.
Theme	Advanced Infrastructure Architecture; Human and Social Issues
Threat Identification	The consequences of all hazards resulting in the need for rapid mobilization and distribution of medical materials across State lines, and potentially across international borders (Canada and Mexico).
Gaps of Existing Capabilities	<p>Research is needed to examine current policies and legal frameworks that guide the governance structure during an event.</p> <p>Analysis is needed to understand the implications of competing or inconsistent regulations and laws that form the foundation for managing crisis events.</p> <p>Furthermore, there is a need to conduct research regarding the existing logistical and distribution practices that influence the supply chain during a disaster (competing State, local, and Federal requirements).</p>
Description of Required Operational Capability	<p>The desired operational capabilities are:</p> <ol style="list-style-type: none"> 1. Analysis of State and Federal requirements, with a focus on conflicting requirements. 2. Recommendations for improving the legal framework to fully incorporate requirements that support logistics, movement of medical materials, volunteers (practicing, non-practicing, retired), restoration of services, and transportation across State lines.
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	Review analysis of HSPD 21. Research under AHRQ.
Capability Gap Statement Tracking and Priority Number	2008-002–Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	Information Sharing
Goal/Objective to which Requirement Responds	<p>Physical Security Goals: Deter and protect against attacks intended to destroy or degrade facilities and sector assets; protect the Sector's physical assets and critical organizational systems from the consequences of all hazards.</p> <p>National Infrastructure Protection Plan, Section 2.2.2 In accordance with HSPD 7, SSAs are also responsible for collaborating with private sector security partners and encouraging the development of appropriate information-sharing and analysis mechanisms within the sector.</p>
Theme	Response, Recovery, and Reconstitution Tools; Protection and Prevention Systems

Threat Identification	Consequences resulting from the inability to disseminate threat or situational awareness data and other real-time information in the event of a disaster.
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Question	Response
Gaps of Existing Capabilities	The Sector currently shares information across multiple mediums, including e-mail and teleconferencing. The Sector does not currently have a standardized method for sharing information, collaborating on Sector-specific activities, or expediting the dissemination of threat data. In addition, the Sector does not have a means for reaching out to the collective Sector for purposes of incident management.
Description of Required Operational Capability	The desired operational capability involves a highly integrated, interoperable, user-friendly system that has the ability to: <ol style="list-style-type: none"> 1. Rapidly disseminate threats and alerts to all security partners and the affected population. 2. Provide real-time situational awareness data on critical infrastructure involved in significant destructive events affecting HPH systems. 3. Utilize different communications platforms (e.g., mobile phones, e-mail, web, landlines, media, etc.) as appropriate for the dissemination of real-time information regarding threats. 4. Broadly communicate across constituencies, irrespective of the classification of the data. 5. Provide a standardized mechanism for document storage, dissemination, and creation.
Identification of Existing Related Capabilities or Technology	Homeland Security Information Network
Identification of Possible Approaches/Solutions	
Capability Gap Statement Tracking and Priority Number	2008-001–Healthcare and Public Health
Is this submission an MS&A requirement?	Yes
Proposed Title of Requirement	Cross-Sector Interdependency Analysis
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Advanced Infrastructure Architecture; Response, Recovery, and Reconstitution Tools
Threat Identification	The consequences of all hazards resulting in the degradation of key resources (e.g., water, energy, transportation, food) upon which the Sector is dependent.
Gaps of Existing Capabilities	While cross-sector interdependencies have been identified for the Sector, the extent of these interdependencies, as well as the potential consequences of disruptions resulting from the loss of non-HPH services/resources, remains unknown. <p>Gaps exist in the ability to:</p> <ul style="list-style-type: none"> ▪ Analyze scenarios that undermine the delivery of these resources. ▪ Identify alternative resources that may be leveraged. ▪ Scientifically measure the consequences resulting from the loss of one or more services/resources to the Sector.

Question	Response
Description of Required Operational Capability	<p>The desired outcome is an MS&A tool that:</p> <ol style="list-style-type: none"> 1. Prioritizes interdependencies based on importance to the Sector. 2. Identifies alternative strategies for service continuity in the event that a key resource is lost or degraded. 3. Provides quantitative data on crisis scenarios to be leveraged for planning, preparedness, and response activities. 4. Leverages exercise data to aid in the development of mitigation and alternative resource strategies in support of preparedness and response.
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	<p>Leverage other studies that have been done related to dependency analysis.</p> <p>NISAC MS&A data on pandemic influenza may be used to inform this topic.</p>
Capability Gap Statement Tracking and Priority Number	2008-003–Healthcare and Public Health
Is this submission an MS&A requirement?	Yes
Proposed Title of Requirement	Compound Threat: Cascading Consequence Analysis
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Advanced Infrastructure Architecture; Response, Recovery, and Reconstitution Tools
Threat Identification	The cascading consequences resulting from all hazards.
Gaps of Existing Capabilities	<p>In the event of a disaster, the cascading consequences resulting from any one of the 15 national planning scenarios or a natural disaster are little understood. Specifically, the Sector has gaps in the ability to:</p> <ol style="list-style-type: none"> 1. Model and examine the cascading effects of such threats as cyber, radiological dispersion devices, or VBIEDs. 2. Estimate or quantify near-term economic impacts and loss of lives. 3. Understand the potential for long-term impacts, including psychological and mission degradation. 4. Develop mitigation strategies.
Description of Required Operational Capability	<p>Desired outcomes include:</p> <ol style="list-style-type: none"> 1. Empirical data on economic or loss of life impacts resulting from cascading effects of all hazards. 2. Scientific analysis that can be integrated into a decision support tool for purposes of situational awareness and incident command and control. 3. Development of a decision support tool that can be leveraged at the local level and regional level from planning, response, and recovery operations.

Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	

Question	Response
Capability Gap Statement Tracking and Priority Number	2008-004–Healthcare and Public Health
Is this submission an MS&A requirement?	Yes – R&D and MS&A
Proposed Title of Requirement	Response and recovery – Long-term Disruptions
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Advanced Infrastructure Architecture; Response, Recovery, and Reconstitution Tools
Threat Identification	The consequences of all hazards resulting in the extended loss of key resources (e.g., water, energy, transportation, food).
Gaps of Existing Capabilities	<p>There is little research or empirical data on the impacts resulting from extended outages to healthcare and public health services. The sector is lacking in the ability to:</p> <ol style="list-style-type: none"> 1. Effectively plan for or test plans to assess response strategies, and 2. Scientifically measure the consequences resulting from the loss of one or more services/resources to the Sector. <p>The sector is deficient in the tools that could aid in decisionmaking during extended outage periods to estimate or predict the rate of supply usage, the required capacity of generator resources, limits on hospital stays, and best estimates on service downtime resulting from resource (water, energy, food, transportation) outages.</p>
Description of Required Operational Capability	<p>The desired outcome is a tool that:</p> <ol style="list-style-type: none"> 1. Supports planning at the tactical and strategic level; 2. Identifies alternative strategies for service continuity in the event that a key resource is lost or degraded; 3. Provides quantitative data on crisis scenarios to be leveraged for planning, preparedness, and response activities; and 4. Supports situational awareness and incident response requirements.
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	
Capability Gap Statement Tracking and Priority Number	2008-005–Healthcare and Public Health
Is this submission an	Yes – R&D and MS&A

MS&A requirement?	
Proposed Title of Requirement	Cyber Disruptions to Healthcare and Public Health
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Advanced Infrastructure Architecture; Response, Recovery, and Reconstitution Tools
Threat Identification	The consequences resulting from a cyber attack on healthcare assets.

Question	Response
Gaps of Existing Capabilities	<p>A great deal is understood about the motivations for cyber aggression, yet the occurrence of such attacks cannot be prevented, and more important, intrusion into networks and systems may not be preventable. With the expanding cyber threat moving from nefarious acts to nation-state actors, the cyber domain has become more complex to understand or articulate.¹³ Few are in agreement as to the potential impacts that intrusion and extrusion may have on healthcare infrastructure.</p> <p>Little analysis or modeling has been done to examine the potential ramifications of an attack on healthcare infrastructure, from hacking into medical device systems to introducing malware into highly sensitive systems. Few if any studies have been produced to assess the extent of damage that could ensue, to identify prime targets of cyber threats, or to demonstrate the cascading consequences of such an attack.</p> <p>In addition, while there obvious reasons for attacks on many of the other 17 CIKR sectors, there are few data from either the intelligence community or managed security providers to suggest or reveal a high degree of interest in healthcare and public health as a target of cyber attacks.</p>
Description of Required Operational Capability	<p>The desired outcome is an analysis that:</p> <ol style="list-style-type: none"> 1. Provides key attributes of systems or infrastructure likely to be a target of cyber attacks. 2. Provides scientific data that detail the potential vulnerabilities in healthcare and public health systems that are likely to be exploited for purposes of infiltrating health systems. 3. Supports planning for IT investments and security. 4. Offers recommendations for improvements to medical systems or information management processes. 5. Supports situational awareness and incident response requirements.
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	<p>Work with health information management associations.</p> <p>Leverage analysis from FDA and the Healthcare Information and Management Systems Society on medical devices system security.</p>
Capability Gap Statement	2008-006–Healthcare and Public Health

¹³ The *National Military Strategy for Cyberspace Operations* defines cyberspace as domain characterized by the use of electronics and the electromagnetic spectrum to store, modify, and exchange data via networked systems and associated physical infrastructures.

Tracking and Priority Number	
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	Volunteers: Liability Exemption
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event.
Theme	Human and Social Issues; Response, Recovery, and Reconstitution Tools
Threat Identification	The consequences of all hazards resulting in the deployment of volunteers.

Question	Response
Gaps of Existing Capabilities	While there exist volunteer management guidance frameworks across many States, there is no standardized method for implementing logistical, communication, vaccination, PPE, and, in particular, liability-exemption requirements to manage and support volunteers during an emergency.
Description of Required Operational Capability	The desired operational capability is: <ol style="list-style-type: none"> 1. National standards regarding volunteer logistics. 2. Implementable liability exemptions for volunteers. 3. Standardized communications, vaccinations, and issuance of PPE to volunteers prior to execution of response and recovery requirements.
Identification of Existing Related Capabilities or Technology	ESAR-VHP
Identification of Possible Approaches/Solutions	Virginia Volunteers Act. The Volunteer Protection Act of 1997. Public Entity Risk Institute (PERI).
Capability Gap Statement Tracking and Priority Number	2008-007–Healthcare and Public Health
Is this submission an MS&A requirement?	No
Proposed Title of Requirement	Temporary Suspension of Laws to Support Mass Fatalities
Goal/Objective to which Requirement Responds	Service Continuity Goals: Continue the provision of essential services (e.g., patient care, public health) and facilitate essential response and recovery functions, both during and following an event; prevent or mitigate the consequences of disruptions to the supply chain or diversion of supplies that could significantly impair continuity of Sector operations.
Theme	Human and Social Issues
Threat Identification	The consequences of all hazards resulting in the need for rapid management of mass fatalities.
Gaps of Existing Capabilities	Current Federal and State mandates do not give appropriate consideration to the requirements for managing mass fatalities. While the intent of most laws is not to impede or restrict the functions of emergency management, many do in fact slow down, hamper, or restrict the operations of such functions as managing mass fatalities. Research is needed to examine and render both legal and social opinions of the impediments of such laws, the ability to suspend certain laws and statutes, and the

	<p>impacts on governance as well as incident management when laws are waived during an event.</p> <p>Furthermore, there is a need to conduct extensive research on the implications and effectiveness of a temporary suspension of certain laws and regulations in the event of a disaster, in order to measure and improve performance in the future.</p>
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Question	Response
Description of Required Operational Capability	<p>The desired operational capability is to:</p> <ol style="list-style-type: none"> 1. Develop a policy or legal framework that allows for the temporary suspension of certain Federal, State, and local laws, rules, and regulations governing the conduct or practice of mass fatalities operations, including the recovery and storage of bodies, funeral arrangements, and cemetery/crematory operations. 2. Establish metrics to measure the effectiveness of suspending regulations, laws, policies, or standards. 3. Develop a decision support tool to assist in identifying the triggers that indicate a need to relax the legal framework, as well as the triggers to re-institute the legal framework. 4. Establish a process for communicating a change in the legal framework during an event.
Identification of Existing Related Capabilities or Technology	Unknown
Identification of Possible Approaches/Solutions	Review of HSPD 21 analysis

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