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Emergency Preparedness and the Development of Health Care Coalitions

A Dynamic Process

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KEYWORDS

• Health care coalition • Patient surge • Resilience • Emergency preparedness

KEY POINTS

- Federally funded Hospital Preparedness Program and the Public Health Emergency Preparedness Programs have become aligned.
- Preparing for medical surge in the hospital and community is difficult.
- Health care coalitions can enhance health system resilience.
- Hospital evacuation is difficult to plan for and to carry out.
- Emergency preparedness requirements have changed and have additional requirements as defined by the Centers for Medicaid and Medicare Services (CMS).

INTRODUCTION

Health care emergency preparedness and the importance of a well-rehearsed, coordinated response have never been more important to the health security of a community or to the nation. Whether it is the threat of terrorism, climate change resulting in flooding, or a new virus for which there is no cure, the health care system will be on the forefront of response. The ability of hospitals, health care systems and the emergency medical system (EMS) to quickly transfer patients, be ready for critically injured people, provide medical counter measures (MCMs), or to initiate just-in-time training to staff to keep people safe is always uppermost for any first responder or hospital first receiver.[1] The role of the nurse in emergency preparedness may not always be visible. Historically, the nurse has not only been the bedside caregiver but a leader in seeing the larger picture when it applies to the hospital or health care community. Nursing process involves collaboration, which is the foundation for effective emergency preparedness and the process of emergency management.[2]

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HOSPITAL EMERGENCY PREPAREDNESS: HISTORY

Hospital emergency preparedness is not a new idea. Hospitals as part of cities and towns in the 1930s were involved with civil defense programs after learning of the pre-war activities in Europe. World War II civil defense efforts and later on in the 1950s continued as communities prepared for potential nuclear attacks, and hospitals prepared for mass casualties. One the earliest hospital evacuation exercises took place in Portland, Oregon, in 1955 as part of Operation Green Light, a civil defense exercise.[3]

Historically, hospitals crafted a disaster plan with a trauma or mass casualty focus. The disaster plan began in the emergency department (ED) and ended when the patient was admitted to the hospital, died, or was discharged. Leadership for the hospital disaster plan was often carried out by nurses and other hospital leaders including: the nurse manager in the ED, trauma nurse coordinator, ED medical director, trauma medical director, hospital safety officer, or the hospital facility manager. Hospital EDs maintained a supply of medical surgical supplies, triage tags, and premade patient charts. The hospital engineering staff checked the emergency generator as part of the requirements for facility management, and load bank tests were carried out. Training on the hospital disaster plan usually occurred once a year and included a review of specific processes through table-top exercises. The greatest effort for training usually occurred in the ED. It is important to note that things have now changed.

Hospitals have coordinated as needed with local and state health departments, particularly in the development of large systems such as Emergency Medical Services for Children (EMSC), developing resources for large-scale mass emergency pediatric critical care,[4] emergency medical systems (EMS), and state trauma systems. Public health departments have historically taken the lead with viral or bacterial diseases that have had the potential to impact large numbers of the population such as norovirus, polio, varicella, rubella, meningitis, foodborne illness, and influenza. Highly virulent public health threats including Ebola virus disease (EVD), pandemic influenza, severe acute respiratory syndrome (SARS), and Zika virus disease require close coordination of both hospitals and public health officials to ensure accurate case counts, worker protection, protocols for testing, processing of laboratory samples, and early identification of those with the disease.

The National Defense Authorization Act for FY 1997 saw the allocation of funds aimed at enhancing domestic preparedness capabilities to respond to a weapons of mass destruction (WMD) incident. This act provided training to first responders (police and fire department) and to assist with the formation of metropolitan medical strike teams (MMSTs). WMD incidents are defined as terrorist-driven biological, chemical, radiological, and nuclear terrorism events. Training was provided to the 120 largest cities in the United States (by 1990 census data). The training, funded by the US Department of Defense (DoD), leveraged interagency coordination between US Federal Emergency Management Agency (FEMA), the US Department of Justice, and the DoD. Hospitals or the personnel responsible for emergency preparedness were not specifically included for training.[5] High-profile events such as the Atlanta Summer Olympics (1996) and the Salt Lake City Winter Olympics (2002) provided additional federal funds for first responders, public safety, and the development of patient care protocols. Hospitals may also choose to part of the National Medical Disaster System (NDMS). NDMS is a federal program comprised of partnerships between the Department of Health and Human Services (DHHS), the Department of Homeland Security (DHS) and the Department of Veteran's Affairs (VA). NDMS hospitals provide internal surge capability for disasters occurring in the United States, and also provide support to the military and VA hospital systems in providing casualty care for injured personnel from overseas conflicts.

EARLY FEDERAL SUPPORT FOR HOSPITAL PREPAREDNESS: THE CHEMICAL STOCKPILE EMERGENCY PREPAREDNESS PROGRAM

Training with other competing health care organizations to enhance hospital emergency preparedness has only recently come to light as an important cornerstone to US health care system resiliency. Although difficult to believe, the same foundations have existed within the Chemical Stockpile Emergency Preparedness Program (CSEPP) for over 20 years. Prior to development of CSEPP in 1985, there was little if any financial support for hospitals to develop/test disaster plans, purchase personal protective/decontamination, or drill with community partners.

CSEPP is a regional/state-based program that provided funding to hospitals and communities whose nearby neighbor includes a US Army military base that stored chemical weapons. Congress passed legislation in 1983 that required the US chemical weapons stockpile to be destroyed, and that maximum assistance was to be provided to the communities who were adjacent to the storage depots. Chemical weapon storage areas, also referred to as storage depots, were originally placed during the 1940s in remote areas, away from population centers. The chemical stockpiles contained munitions of either blister or nerve agents. They were located in Alabama, Arkansas, Indiana, Illinois, Maryland, Oregon, Washington, and Utah. Of the original 10 sites, 2 sites remain active, Pueblo, Colorado, and Lexington, Kentucky, and anticipate agent destruction beginning in 2016. Funding for the CSEPP is a cooperative grant process, funded through DoD (US Army) with support from FEMA. Assistance is provided during the time that stockpile destruction facilities are constructed and through the end of chemical agent destruction.[6]

Each community (including hospitals) developed plans and capabilities several areas, called “Benchmarks”:

- Alert and notification include the various public communication devices that notify both military or the community of the release of a chemical agent. Notification devices include sirens, tone alert radios, and highway reader boards (electronic signs).
- Automated data processing means the ability of critical monitoring systems for an unintended chemical agent release to be seen by military base leaders, public information officers, and community leaders.
- Communications are comprised of interoperative, functional information-sharing systems that link the military on post leaders (base commander and support staff) with state leaders, local community leaders, response agencies (police, fire, and EMS), and citizens. Communication systems include video teleconferencing, portable radios, fax machines, cell phones, radio/television studios or broadcast, and telephones.
- Coordinated plans include emergency preparedness plans that are specific for each state, military installation, and for communities closest to the storage depot/chemical weapons destruction facility. These locations are at greatest risk should an off post release of chemical agent occur though a spill or airborne means. Coordinated plans involve identification of specific geographic zones. These locations are either the closest to the military base (therefore at greatest risk) or are further away (lower risk). These locations are referred to as the immediate response zones (IRZ) and the protective action zones (PAZ).
- Decontamination is the process of removing a chemical agent (nerve agent or blister agent) from clothing, skin or hard surface, or through washing with soap and water. The use of bottled bleach or a bleach solution is not recommended for skin, hair, or body surface decontamination.

- The emergency operations center (EOC) is a physical location that contains electronic communication devices such as radios, computer support, and telephones that coordinates a response to a disaster event. CSEPP-supported EOCs also contain computer systems that monitor the accidental release of a chemical agent off the military base (note—a release of chemical agent off post into the community has not occurred during the agent destruction or storage process).
- The term exercises refers to a program of testing and evaluation of the community (state and local governments, first responders, hospital personnel) to respond to an off post release of chemical agent. This includes coordination of messages (alert and notification), evacuation to a different location, setting up decontamination areas, decontamination of potential agent exposure, medical care, and other tasks.
- Personnel include various supportive roles for the program including program coordinators, planners, and public affairs/public information officers.
- The CSEPP program provides funding for the purchase of personal protective equipment (PPE) that is intended to protect workers from exposure to military chemical agent during the process of decontamination (removal of agent from the skin, clothing, or hair). Chemically resistant suits, gloves, boots, and powered air purifying respirators (PAPRS) are provided. The level of protection in the community is at US Occupational Safety and Health Agency (OSHA) level C. Higher levels of worker protection/PPE are in place on the military installation, and at the first responder level (fire department). As required by both US Army and OSHA regulations, extensive training is required before personnel can put on PPE and use the equipment either in a simulated or real-world situation.
- Education and training programs should be consistent with FEMA, state, and local areas. A training plan (for off post jurisdictions) and US Army certification requirements (for on post installations) is developed, and maintained proficiency of emergency services providers/responders, and CSEPP staff (as defined and measured by CSEPP guidance) is developed and presented on a scheduled basis.
- Medical support is comprised of a medical program for off post medical preparation and response to a CSEPP incident/accident. The medical support program includes several elements:
  - Medical guidance that addresses the relevant aspects of worker protection and patient care for individuals potentially exposed to a chemical agent release
  - Medical training for personnel to perform specified patient care activities, such as screening, triage, treatment, decontamination, transport, disposition, and patient tracking
  - Medical emergency operations that are in accordance with CSEPP guidance and federal, state, local, and generally accepted standards for patient care and worker protection
  - Coordinated medical plans and procedures, as appropriate, with the CSEPP alert and notification system, the Joint Information Center (JIC), and the Joint Information System (JIS)
  - Ensure that medical personnel participate in community response and recovery planning and community-based exercise and evaluation programs
  - Public awareness—multi-media information that is provided to the general public related to what chemical agents are stored on the military base, the processes of agent destruction, and information related to planning for family/individual shelter in place or evacuation, should it become necessary.

Participation in the CSEPP program is a commitment from both public health partners (local and state) and hospitals[7] in the state where the stockpile is located. A memorandum of understanding (MOU) is executed, which details the responsibilities of both the hospital as well as government partners. MOU hospitals receive supplies of medical countermeasures (autoinjectors of atropine and pralidoxime) if the stockpile site contains nerve agent. Decontamination supplies and PPE purchases are also funded. A comprehensive medical management course is offered to all CSEPP health care partners (hospital and prehospital). The all hazards course contains additional information on agent identification, decontamination, personal protective equipment use, medical countermeasure administration, incident command structure, alert/notification strategies, chemical casualty patient surge, and patient casualty medical management.

Prior to the development of the role of hospital emergency manager, nurses who were leaders in MOU hospital EDs or the hospital safety officers were often responsible for developing specific hospital plans as part of their participation in CSEPP. They formed collaborative relationships with other hospitals in order to learn from each other and plan for potential chemical casualties. These early collaborations/coalitions were called integrated process teams (IPTs). The medical IPT included prehospital providers, specifically fire department hazardous materials teams (HAZMATs), physicians, and nurses. HAZMAT teams assisted in development of the requirements that would be needed for receiving potentially contaminated patients. Public health program managers served as liaisons between state emergency management, FEMA and US Army points of contact. IPTs established performance measures used not only for exercise evaluation, but also for planning guidance.

An evaluation of each CSEPP community's level of readiness occurs each year. Each CSEPP MOU hospital and its community partners participate in a full-scale annual exercise. Evaluators external to the community evaluate the ability of the community to respond to a chemical agent event both at on post (US Army storage location) and off post (community) locations. Hospital triage, decontamination, incident command system (ICS), implementation, and patient management are evaluated. Prehospital care and participation of first responders are also evaluated as part of the continuum of victim care. Exercise response outcomes (EROs) are used to measure progress in meeting specific objectives, and can be followed over the length of time that the program is in place for each community. Annual exercises reveal strengths and weakness. For example, new staff at a hospital may be unfamiliar with how to put on PPE, set up decontamination sites, or communicate with state and local leaders. Exercises teach and test. Within the medical environment, following requirements for dealing with hazardous materials is particularly important, and something that is closely evaluated each year. As with any disaster exercise or event, a prior understanding of the emergency operations plan, special procedures, or the use of equipment not used on a daily basis is vital. Safety issues, whether for simulated victims or people performing decontamination, are closely scrutinized. For example, stores of medical countermeasures (nerve agent antidote kits) are counted annually as well as medication expiration dates. One of the greatest challenges in the CSEPP program is personnel turnover, and loss of institutional memory, meaning a key person leaves an organization who knew where everything was located and how the procedure was to be carried out. The evaluation process at a hospital site identifies actions or plans that go well or need correction. This establishes a continuous quality improvement cycle whose elements can be measured over time.

Exercise Response Outcomes

Identification of areas in need of improvement or recognizing a process that reflects best process is inherent in the CSEPP program's exercise and evaluation process.

The metrics for evaluating exercise performance (EROs) have been developed for several areas:

ERO 1 prevention and preparedness—does the community/state/hospital have an emergency operations plan and process? How often is the plan updated? Is the update documented? Is the plan followed?
ERO 2 emergency assessment—has there been a release of agent? Where is it located? What has been released? Who is in danger?
ERO 3 emergency management—organization and response of state and local officials who plan for disasters
ERO 4 chemical agent identification (CAI)/hazard mitigation—do personnel know how to operate chemical agent detection equipment and interpret the results?
ERO 5 protection—are communities at the greatest risk notified in a timely manner? Are people/animals evacuated or sheltered in place?
ERO 6 victim care[a]—this is where public health, EMS, and hospital performance is measured (see descriptions listed previously under the benchmark section for medical support). Victim care has also been extended to include pets and livestock considerations.
ERO 7 emergency public information—how quickly does emergency information get shared with the community regarding a potential release of chemical agent?
ERO 8 remediation/recovery—what processes are followed to determine it is safe for people to return to their home or community? What additional steps need to be taken?

Hospital requirements such as those described in the US Joint Commission (JC) Emergency Preparedness standards are used as benchmarks when evaluating hospital performance. Each CSEPP exercise includes the required elements from the US

The US National Disaster Medical System (NDMS) is a federally coordinated system designed to supplement the integrated national medical response to a disaster in the form of personnel, teams, supplies, and equipment. NDMS is also involved with patient movement from a disaster site to unaffected areas of the United States, and provision of medical care at participating hospitals in unaffected areas. There are several things to note concerning NDMS:

- Part of the US Department of Health and Human Services (DHHS)—Office of Preparedness and Response
- Part of Emergency Support Function #8 (ESF8)
- Assists with provision of medical care at times of disaster
- Supports the US Department of Veteran Affairs in caring for casualties from war after they are transported back to the United States

Contains specific response teams with individual mission focus including

- DMAT—Disaster Medical Assistance Team
- DMORT—Disaster Mortuary Response Team
- NVRT—National Veterinary Response Team

[a] The views expressed in this article are those of the author and do not reflect the position or contracted work provided by Battelle Memorial Institute.

National Incident Management System (NIMS). Evaluators also receive additional training on the integrated process and evaluation (IPE) system prior to being part of an exercise. All participants receive a written summary of their performance with strengths, observations, and findings noted.

THE HOSPITAL PREPAREDNESS PROGRAM: CURRENT STATUS

Federal funding for hospitals and the start of the US Hospital Preparedness Program (HPP) began by the passage of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 and was administered by the US Health Resources and Services Administration (HRSA)[8] of DHHS. The grant program supported health-related activities to prepare for and respond effectively to bioterrorism and other public health emergencies, including the preparation of an emergency preparedness plan. Programmatic emphasis moved to an all-hazards capability-based approach in 2004, and encouraged collaboration in the development of a hazard vulnerability analysis (HVA). The HVA is the base or identification of potential threats to the hospital (or the community), from which all emergency preparedness planning is derived. The HVA is to an emergency preparedness plan as a comprehensive patient history is to developing the nursing care plan; it is difficult to have one without the other if one wants to achieve success.

The Pandemic and All Hazards Preparedness Act of 2006 (PAHPA) created the Office of the Assistant Secretary for Preparedness and Response (ASPR) as the principle advisor to the secretary for DHHS.[9] The HPP program was transferred from HRSA to ASPR, which placed the program in alignment with federal response programs such as NDMS.[10] Within the HPP, the overarching goals include improving medical surge and hospital preparedness. Specific programmatic goals included several items:

- Establishing and maintaining electronic systems to track available hospital beds and other resources through the US National Hospital Available Beds for Emergencies and Disasters (HAvBED) system
- Establishing and maintaining the US Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) networks—which consist of electronic systems to register, track, and verify the credentials of volunteer health care providers to assist with medical surge during public health emergencies
- Developing health care coalitions and partnerships—networks of health care facilities that can provide medical services, resources, or support during a public health emergency
- Educating and training health care workers
- Implementing and maintaining NIMS activities
- Engaging with other responders through interoperable communications system
- Establishing, maintaining, or enhancing medical countermeasure caches to protect health care workers during an emergency
- Enhancing mass fatality management and evacuation and shelter-in-place plan
- Exercising and improving awardee preparedness plans and coordinating regional exercises

Alignment of the HPP with the US Public Health Emergency Preparedness (PHEP) program occurred in 2012, integrating hospital and public health preparedness and elimination of duplicate goals.[11] The goal of PHEP, which is administered by the US Centers for Disease Control and Prevention (CDC), is to strengthen state and local public health departments' ability to respond to a variety of public health emergencies. Programmatic goals include

- Developing plans to receive, store, distribute, and dispense medical countermeasures during a public health emergency
- Testing awardees' ability to notify and assemble appropriate response staff during an emergency
- Building laboratory capability for testing and identifying harmful pathogens and reporting results to CDC
- Communicating health, risk, and other information in a timely manner to the public in public health emergencies
- Conducting drills and exercises to test response capabilities and activities
- Completing after action reports and improvement plans to improve response times and activities for future drills, exercises, or real events

The need for additional realignment for both the PHEP and HPP programs was described by the US General Accounting Office (GAO) in its March 2013 report.[12] The report noted that progress had been made with some of the capabilities, but was lacking, especially in the area of hospital evacuation. Hospital and health care facility evacuation became a focal event with the landfall of the 2012 Hurricane Sandy in New York City. Hospitals are required to have evacuation plans as part of accreditation and US Centers for Medicare and Medicaid Services (CMS) regulatory requirements; however, they are rarely if ever fully tested due to patient acuity. Flooding and back-up generator failure led to the unplanned evacuation of several large downtown hospitals including New York University (NYU) Langone and Bellevue Hospital. The New York Downtown Hospital evacuated prior to landfall of the hurricane, as did the Veterans Administration Manhattan Hospital. Established relationships with other hospital systems and other elements that were present in the coalition contributed to the successful evacuation of multiple hospitals.[13]

HOSPITAL PREPAREDNESS: MOVING TOWARD HEALTH CARE RESILIENCY THROUGH COALITIONS

One of the hallmarks of PHEP and HPP has been development of coalitions. Coalitions have existed prior to the development of the HPP. Coalitions developed with the CSEPP program, Metropolitan Medical Response System (MMRS), Metropolitan Strike Teams, and now with the hospital preparedness program. Coalitions are locally or regionally based. Membership within coalitions is defined at the local level (city, county, state, or region). Coalitions have established leaders who have specific roles and responsibilities as well as an organizational framework. Individual organizational support is identified through the development of an MOU or memorandum of agreement. Such agreements articulate roles and responsibilities, identify the process for distribution of funding sources, and facilitate the integration of the preparedness community. For example, some coalitions have used HPP grant dollars to purchase equipment, creating communications networks between facilities and first responder partners. They have purchased caches of supplies and established community-based emergency preparedness exercises. Coalitions exist as a result of established day-to-day relationships within a hospital and between hospitals and public health partners. Relationships develop that include levels of trust, familiarity, and dependability. Coalitions have expanded outside the hospital/public health boundaries to include skilled nursing facilities and long term care facilities, all of which are part of the fabric of health care providers in the community. Many coalitions share training schedules, offer joint educational or preparedness conferences, and act as mentors to other health care partners as they develop emergency preparedness plans for their organizations. In times of emergency, knowing one's coalition partners and how to reach them quickly can help keep health care services intact. The ability to bounce back in the face of disaster is the hallmark of resilience.[14] As of 2016, funding levels for both the HPP and

PHEP program have been cut, forcing hospitals to determine whether participation in regional coalitions, planning efforts, and exercises is still worth their financial support.

ON THE HORIZON: CENTERS FOR MEDICARE AND MEDICAID SERVICES REGULATORY REQUIREMENTS

Health care accreditation organizations such as The Joint Commission (TJC), Det Norske Veritas Germanischer Lloyd (DNV-GL), and Health Facilities Accreditation Program (HFAP) have specific requirements for hospital emergency preparedness. The various accreditation standards include common elements such as development of hospital emergency preparedness plans based on a hazard vulnerability analysis, communication plans (inside and outside the hospital), establishment of a hospital incident command system, maintenance of essential environmental controls (heating/cooling/water/sewage), provision of food for patients and staff, patient/staff tracking, enhanced security, and provision of emergency generator power. Hospitals are also required to test their emergency preparedness plans once a year. The new CMS requirements also include participation in an annual community-based disaster exercise and a table-top exercise. Table-top exercises are useful for evaluating specific disaster processes or procedures however, cannot evaluate an emergency preparedness program.

On December 27, 2013, DHHS and CMS issued proposed regulations that build on the many of the existing hospital accreditation standards but also extended preparedness requirements to 17 other entities, including skilled nursing facilities, long-term care, group homes, dialysis facilities, and out patient surgery.[15] Some of the elements contained in the proposed regulations differ from accreditation requirements, specifically with emergency generator testing and the acceptable use of a table-top exercise to test the emergency preparedness plan. CMS released the final rule "Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers" (CMS 3178-F) on September 8, 2016. The regulation goes into effect November 16, 2016 and implementation/compliance is required by November 16, 2017.

SUMMARY

Hospital emergency preparedness is not a new concept, but one that has grown in complexity and importance. Relationships that have developed with other health care partners are important to nurture and contribute to community resilience. Health care coalitions, which include health care partners at every level, are an important part of this process. Federal support for the hospital preparedness program has contributed to greater levels of preparedness for emergencies, both large and small.[16] The nation's communities have come to expect that the health care services they use on a daily basis will be there in the future, even if a disaster occurs.

REFERENCES

1. Scott LA, Ross AP, Schnellmann JF, et al. Surge capability: CHPTER and SC healthcare worker preparedness. J S C Med Assoc 2005;107:74–7.
2. Waugh WL, Streib G. Collaboration and leadership for effective emergency management. Publ Admin Rev 2006;132–40 [Special Issue].
3. Oregon State Civil Defense Council. Annual civil defense report. Portland (OR): Government Printing Office; 1956.
4. Burkle FM, Williams A, Kissoon N. Pediatric emergency mass critical care: the role of community preparedness in conserving critical care resources. Pediatr Crit Care Med 2011;12(Suppl 6):S141–51.

5. Combating terrorism. Observations on the Nunn-Lugar-Domenici Domestic Preparedness Program. 1998. Available at: www.gao.gov/archive/1999/ns99016t.pdf. Accessed March 16, 2016.
6. Destruction of existing stockpile of lethal chemical agents and munitions PL 99–145 Title 14 (B)§1412 -1983. Available at: https://www.gpo.gov/fdsys/pkg/USCODE-2011-title50/pdf/USCODE-2011-title50-chap32-sec1521.pdf. Accessed March 19, 2016.
7. Chemical Stockpile Emergency Preparedness Program. Guidance December 2012. Available at: http://www.fema.gov/media-library-data/20130726-1903-25045-3905/csepp_program_guidance_december_2012.pdf. Accessed March 5, 2016.
8. Public Law 107-188- June 12, 2002. Public Health Security and Bioterrorism Preparedness and response Act of 2002. Available at: https://www.gpo.gov/fdsys/pkg/PLAW-107publ188/pdf/PLAW-107publ188.pdf. Accessed March 5, 2016.
9. The Pandemic and All Hazards Preparedness Act. Available at: https://www.gpo.gov/fdsys/pkg/PLAW-109publ417/pdf/PLAW-109publ417.pdf. Accessed March 5, 2016.
10. The National Disaster Medical System. Available at: http://www.phe.gov/Preparedness/responders/ndms/Pages/default.aspx. Accessed April 12, 2016.
11. CDC-RFA-TP12-1201 Hospital Preparedness Program (HPP) and Public Health Emergency Preparedness (PHEP) cooperative agreements. 2012. Available at: http://www.cdc.gov/phpr/documents/cdc-rfa-tp12-1201_4_17_12_final.pdf. Accessed March 5, 2016.
12. National Preparedness. Improvements needed for measuring awardee performance in meeting medical and public health preparedness and goals. U.S. Government Accountability Office; 2013. Available at: www.gao.gov/assets/66/653259.pdf. Accessed March 5, 2016.
13. Adalja AI, Watson M, Bouri N, et al. Absorbing citywide patient surge during hurricane sandy: a case study in accommodating multiple hospital evacuations. Ann Emerg Med 2014;64(1):66–73.
14. Rambhia K, Waldhorn R, Selck F, et al. A survey of hospitals to determine the prevalence and characteristics of healthcare coalitions for emergency preparedness and response. Biosecur Bioterror 2012;10(3):304–13.
15. Department of Health and Human Services. Centers for Medicare & Medicaid Services. Medicare and Medicaid Programs; emergency preparedness requirements for Medicare and Medicaid Participating Providers and Suppliers; Proposed Rule. 2013. Available at: https://www.gpo.gov/fdsys/pkg/FR-2013-12-27/pdf/2013-30661.pdf. Accessed March 5, 2016.
16. Toner ES, Ravi S, Adalja A, et al. Doing good by playing well with others: Exploring local collaboration for emergency preparedness and response. Health Secur 2015;13(3):281–9.