

Improving health system preparedness for terrorism and mass casualty events

Recommendations for action
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A consensus report from the AMA/APHA Linkages Leadership Summit
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Preface: A call for action

Since September 2001, our nation has intensified efforts to improve the systems responsible for protecting and ensuring the health, safety and well-being of individuals and communities in a disaster. However, a great deal of work still remains to fully integrate practicing health professionals into a comprehensive system to provide the best possible response. Currently, the U.S. emergency health care system faces significant challenges on a day-to-day basis. Hospital overcrowding, an eroding trauma system, inadequate funding for enhanced 9-1-1 services, escalating liability costs and rising numbers of uninsured patients represent just some of the baseline challenges. To address this situation, the American Medical Association (AMA) and the American Public Health Association (APHA) convened a series of leadership summits to develop a report, as a national call for action from medicine, dentistry, nursing, emergency medical services, hospital systems and public health to strengthen health system preparedness, response and resilience to terrorism and other catastrophic events. Recommendations in the report seek to:

- Ensure adequate funding to develop the critical infrastructure essential for day-to-day emergencies in such a way that it can be scaled up to meet the needs of larger and more severe emergencies.
- Ensure that the response work force is sufficient both in numbers and appropriate level of proficiency in disaster preparedness and response.
- Ensure that our health care and public health systems are fully integrated and interoperable at all levels of government and with the civilian sector in ways that allow for a rapid and efficient disaster response.

In March 2007, the AMA and APHA met with state and local public health leaders in New Orleans to critically assess the relevance and utility of this report, considering their unique vantage point and experience with hurricanes Katrina and Rita. Meeting participants acknowledged the timeliness and importance of the report but identified additional needs that should be considered in continued efforts to improve health system preparedness. These include limitations of the Stafford Act that restrict the capacity to rapidly address federal funding to rebuild critical health infrastructure; the need for more regulatory flexibility to allow for rapid recovery of local health systems; the need for more flexible regulatory processes to allow for the rapid reopening of closed health care facilities; the need for urgent economic development assistance for practicing clinicians and other health providers in ways that accelerate rebuilding of community infrastructure; and finally, the urgent need to address the ethical practice of health care delivery in mass casualty and other disaster situations to aid in medical decision-making.

While this report presents important perspectives on the subject of preparedness for mass casualties, with consensus recommendations that we believe will move our nation forward, we must understand that preparedness is a process, and not a point in time, and that these recommendations must be reviewed and refined continually over time.



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Introduction

Prior to, but especially following the terrorist attacks on Sept. 11, 2001, billions of dollars were appropriated to state and local governments, as well as academic and other private sector entities, to improve “public health preparedness.” While there has been improvement in building overall response capacity, much more still needs to be done. To this end, four issues continue to be raised:

- (1) Public health, emergency medical services (EMS) and medical preparedness activities at the state and local levels remain poorly integrated. As a result, the ability to detect and respond to public health emergencies may be compromised.
- (2) The health system is underprepared to deal efficiently and effectively with large numbers of casualties from a terrorist attack or other catastrophic event. While they are critical components of the response infrastructure, in many communities, regions and states, the public health and health care systems currently function at capacity level and lack the capability for coordinating resources, facilities and training to ensure the requisite surge capacity should a mass casualty event occur.
- (3) There is no agreed upon baseline of established all-hazards standards or guidelines for defining or measuring health system preparedness. Without precise metrics or performance measures for preparedness, readiness cannot be measured or be consistent across regions and states.
- (4) No shared policy platform exists among public health and health care organizations on which to build a strong, coordinated advocacy and legislative agenda to improve and sustain health system preparedness for terrorism and mass casualty incidents.

Historically, the acute care, EMS and public health systems have been poorly integrated with one another, as well as with other response entities

(e.g., law enforcement). In many states and communities, these systems largely function independently of one another, with separate structures, communication systems, personnel requirements, procedures and protocols. Recent terrorist events and natural disasters underscore the real need to move beyond the present situation toward an emergency health system that is truly interoperable and integrated. This entails enabling public health, health care and other response personnel to work as a team, with adequate resources, facilities and training to enable them to better coordinate their assigned tasks.

In July 2005 and June 2006, leaders from 18 national medical, dental, nursing, public health, hospital and EMS organizations met in Chicago and New Orleans, respectively, to deliberate the (1) deficiencies in the medical and public health disaster response system and (2) lack of necessary linkages between key components of this system—the acute care, EMS and public health sectors. This report synthesizes priorities and recommendations expressed by various stakeholder groups to promote ways the acute care and EMS systems can improve cooperation, coordination and communication with state and local health authorities in preparing for or responding to terrorism and mass casualty events. It serves as a national call for action by asking for stronger commitment from health professionals, legislators, government officials and organizational leaders to build the necessary critical mass and political will to effect meaningful change.

Priority issues and strategic recommendations

To enhance collaboration, the American Medical Association (AMA), in partnership with the American Public Health Association (APHA), convened the leadership summit meetings to explore the needs of, gaps in and barriers to effective integration of preparedness and response activities among acute care and EMS with public health agencies at state and local levels. As co-facilitators, the AMA and the APHA used these opportunities to foster interaction

and communication among key stakeholders representing the public health and health care professions. Overarching goals were to explore critical questions on disaster preparedness and response capacities and capabilities, develop action-oriented recommendations to improve and sustain health system preparedness, and combine each organization's advocacy expertise and experience to promote a shared agenda. During their deliberations, summit participants identified eight priority issues that must be addressed to improve health system preparedness for terrorism and mass casualty events:

- Collaboration, coordination and planning
- Communications and information exchange
- Disaster recovery and health systems
- Education and training
- Funding
- Health system surge capacity
- Legislation and regulation
- Research

To meet these priorities, summit participants selected a balanced portfolio of specific actions that were deemed both feasible and achievable. In follow-up meetings, organizational representatives prioritized and achieved consensus on 53 strategic recommendations that could be disseminated and promoted as a shared advocacy agenda. Of these, the group identified nine critical recommendations (listed on pages 18–19), which require most urgent action. To demonstrate collective support for this initiative, organizational leaders signed a “pledge of commitment” to work together in implementing the summit recommendations.

1.0 Collaboration, coordination and planning

Every community should have a disaster plan. This requires coordination and collaboration among myriad agencies and disciplines, including: public health departments; law enforcement, fire departments and EMS; utility companies; government and business officials; hospitals; health care professionals; schools; local military installations; and others. Disaster plans must address the short- and long-term objectives of response and recovery activities to include: mobiliza-

tion of resources to protect public health and safety; restoration of essential government services; and provision of emergency relief to government, businesses and victims. Plans must consider all populations, including (but not limited to) those with special needs such as children, the elderly, pregnant women, psychiatric patients and disabled persons, who may be more vulnerable to adverse health effects. Disaster planning also must address the role of volunteer citizens who are likely to be among the first to arrive at the scene and thus serve as a vital link between local EMS and the injured. This may be particularly relevant during a major mass casualty event in which local EMS and hospital services are overwhelmed, and especially when time becomes the most critical factor for saving the critically injured.

Health care professionals have a significant role in all disasters and must be present during planning to ensure that the health and medical needs of all citizens are addressed. They also must be present to ensure that community disaster plans include essentials for effective participation of public health and health care professionals in all training and response activities.

In a disaster, community resources will likely be challenged by a surge of people seeking medical and mental health services. Linking people to appropriate resources must be closely coordinated with state, local and federal health systems. Currently, some of these systems are fragmented, with considerable variability around the country in how emergency care is handled. Federal responsibility for emergency and trauma care is widely dispersed among multiple agencies. In recent years, more effective interagency collaborations have been formed to enhance the federal government's ability to assist states and regions in responding to medical disasters (such as through the Federal Interagency Committee on Emergency Medical Services). Despite such efforts, strong national leadership remains lacking. Presently, there are no truly comprehensive emergency medical, trauma care and disaster preparedness systems that are fully integrated with national, state and local public health systems. Recognizing that many natural and

human-made disasters cause physical trauma, it may be most efficient and cost-effective to use national, statewide and regional trauma care systems as a model for building a comprehensive medical disaster response system.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

- 1.1 Expedite progress nationwide in integrating all aspects of the health systems responsible for emergency and trauma care in a disaster. As important first steps, this requires implementation of the recommendation in the Institute of Medicine (IOM) Future of Emergency Care report series,^{1,2,3} which calls for the establishment of a lead agency for emergency and trauma care, and the federal mandate to foster interagency collaboration among emergency and trauma care services at the national disaster medical response level via the Federal Interagency Committee on Emergency Medical Services and related advisory bodies. The locus of responsibility for effective coordination of all federal agencies involved in disaster response should reside in an agency normally involved in the routine response to day-to-day emergencies, upon which the catastrophic medical disaster response must be built. **(Recommendation for federal/state/local/professional action)**
- 1.2 Ensure direct involvement of public health and health care professionals in all governmental and health system emergency and disaster preparedness planning, mitigation, response and recovery operations; require their active participation at all incident command and emergency operation center activations, responses and exercises to

provide public health and medical guidance. Public health and health care systems have a distinct and important role to play in all phases and types of disasters and should be part of the critical infrastructure and unified incident command of all multidisciplinary responses. **(Recommendation for federal/state/local/professional action)**

- 1.3 Require an all-hazards approach in the development of public health and health care disaster preparedness and response plans to address day-to-day and catastrophic emergencies, as well as the unique needs of special/vulnerable populations (e.g., children, elderly, disabled) and tribal nations. **(Recommendation for federal/state/local action)**
- 1.4 To the extent possible, enhance portability and sustainability between the emergency response and acute care systems through identification, availability and use of standardized equipment and protocols for communications, personal protection and agent detection, as well as for medical and operational emergency preparedness (especially in terms of field triage and treatment rules) throughout the duration of an emergency event. **(Recommendation for federal/state/local action)**
- 1.5 Use local and state public health agencies as a visible nexus for coordinating acute care facilities, the EMS system, individual health care practitioners, local community groups and public health resources with other governmental agencies, including emergency management, fire and law enforcement. **(Recommendation for federal/state/local action)**

<ol style="list-style-type: none">1. Institute of Medicine, Committee on the Future of Emergency Care in the U.S. Health System. <i>Emergency Care for Children: Growing Pains</i>. Washington, DC: National Academy Press; 2006.2. Institute of Medicine, Committee on the Future of Emergency Care in the U.S. Health System. <i>Emergency Medical Services At the Crossroads</i>. Washington, DC: National Academy Press; 2006.3. Institute of Medicine, Committee on the Future of Emergency Care in the U.S. Health System. <i>Hospital-Based Emergency Care: At the Breaking Point</i>. Washington, DC: National Academy Press; 2006.

1.6 At least annually, engage public health and health care professionals in evaluating all-hazards emergency preparedness and response plans through drills and other exercises in collaboration with state and local emergency management and public safety agencies. Drills and exercises should be designed to stress the community system-level response over time, and should address event notification, communication, resource allocation and patient management. In accordance with the IOM Emergency Care for Children report,¹ disaster drills should include a pediatric mass casualty incident at least once every two years. **(Recommendation for federal/state/local action)**

1.7 Engage public health and health care personnel and their professional associations in ongoing dialogue at the local, regional, state and tribal levels to identify and develop mutual efforts within their communities, regions and states to strengthen day-to-day health system preparedness and emergency response capacities and capabilities. This includes development of model plans and coordinated strategies, taking into account best practices and lessons learned for enhancing community, regional and state health and emergency response to disasters, with emphasis on a multidisciplinary approach. Joint consensus documents should be developed to clearly delineate the roles and responsibilities of each community response sector and identify the unique resources each group brings to an organized and efficient emergency response for the jurisdiction. **(Recommendation for state/local/professional action)**

1.8 Promote collaboration among appropriate state and federal agencies, tribal authorities, and health care organizations in the development and initiation of national stakeholder group meetings to address health system preparedness. These meetings should focus on understanding the mission, lexicon and functions of multiple specialty groups; identifying opportunities for collaboration at the local, state, tribal and national levels; and

promoting mutual respect across all response sectors. **(Recommendation for federal/state/professional action)**

1.9 Recognize the contributions and improve the integration of citizen volunteers and nongovernmental organizations into federal, state, regional and local disaster planning and response efforts. **(Recommendation for federal/state/local action)**

1.10 Encourage national professional organizations to direct their state and local affiliates to become involved in planning for the health and medical response to disasters at the state and local levels (through Web sites, newsletters, policy statements, and other communication and advocacy efforts). **(Recommendation for professional action)**

2.0 Communications and information exchange

In a disaster, the ability to establish and maintain open lines to communicate efficiently with health care facilities, emergency workers and public safety organizations is crucial. All emergency responders, including public health and health care professionals, must be able to effectively communicate with one another multidirectionally, in real time, using a common language, before, during and after the event occurs. Information and communication networks should be redundant, secure and linked to the public health and health care systems for disease surveillance and timely information sharing.

A carefully prepared plan is needed to protect vital communication links among emergency responders and ensure that information interchange can continue. All agencies that may respond to a disaster in a given community must cooperate in advance to identify those methods of communication that will persist under most conceivable conditions. Timely and accurate information and analysis must be coupled with effective, rapid dissemination of such information to those who need to know (e.g., response personnel and the public) to instill confidence in both short- and long-term response efforts in the affected community. Without effective pre-event

planning and coordination, including the clear articulation of a common single message from all authoritative sources, the media will be ineffective in communicating health hazards and risk avoidance to the general public. Continued effort to strengthen relationships among the public health and health care sectors through robust information systems and communication networks remains of paramount importance.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

- 2.1 Require that disaster communication and health information exchange systems and protocols be fully integrated and functionally interoperable at all emergency response levels. Reliable, real-time networks must be available for use among hospitals, EMS agencies, public safety departments, emergency management offices and government agencies during day-to-day operations, as well as during a disaster to improve situational awareness, enhance victim treatment and ensure efficient transport to definitive care facilities. **(Recommendation for federal/state/local/professional action)**
- 2.2 Ensure that public health and health care systems nationwide actively collaborate with the media, religious and civic leaders, and policymakers to accurately inform and educate the public about potential risks and effective coping strategies associated with disasters. Such information should be provided both pre- and post-event to enhance individual and community resiliency. **(Recommendation for federal/state/local/professional action)**
- 2.3 Establish effective, real-time data systems to capture and share medical and public health information. This includes: (a) acceleration of initiatives to develop, implement and foster widespread use of interoperable electronic health record systems to support emergency responders and health professionals and improve the quality

and efficacy of patient care; (b) improvement of syndromic surveillance systems, disease and injury reporting, and electronic connectivity of public health and EMS agencies and hospitals throughout all disaster medical response phases; and (c) implementation of early notification and warning systems to identify possible risks based on trends. **(Recommendation for federal/state/local/professional action)**

- 2.4 Ensure that all community responder groups know how to implement and use patient tracking systems to access information on family members or friends believed to be patients as a result of the disaster. Available systems (e.g., the American Red Cross Patient Connection Program) should be integrated to maximize efficiency. Public service announcements should be developed to instruct the public on how to access such systems. **(Recommendation for federal/state/local/professional action)**
- 2.5 Develop and disseminate consistent information for public health and health care professionals and the public describing the policies, roles and legal authority of state and local public health agencies during a disaster (e.g., authority to activate or enforce quarantine and isolation). **(Recommendation for federal/state/local/professional action)**
- 2.6 Provide opportunities for debriefing and information sharing—both internally and externally—on hospital, community, regional and state response to actual disasters as well as disaster drills and exercises, with implementation of a plan to address identified gaps in response plans and protocols, and appropriate follow-up for continuous quality improvement. **(Recommendation for federal/state/local action)**
- 2.7 Increase access to and availability of appropriately trained public health personnel in hospitals and other medical treatment facilities to assist in disease and injury reporting and surveillance activities. **(Recommendation for state/local action)**

3.0 Disaster recovery and health systems

In all communities, health systems and assets are vital components of the critical infrastructure and provide tremendous social and economic benefits. In a disaster, the incapacity or destruction of such systems and assets would have an immediate, debilitating impact on local medical and public health programs and services, as well as on economic security. Adequate response and recovery in a disaster cannot occur without a fully resourced, protected and connected health system that functions effectively on a day-to-day basis. Government agencies at the federal, state and local levels need to understand that the viability of this system is an essential part of a community's critical infrastructure. Targeted and sustained investment in enhanced health system preparedness for disasters serves as an engine for economic growth and development before an event occurs, as well as post-event for community redevelopment and recovery.

Once a disaster has ended and all threats have passed, the overall goal of recovery is to restore the community to a “normal” level of functioning. This can be the most difficult phase of the incident and requires effective preparation and planning to reduce the stressors associated with a catastrophic event and facilitate the recovery process. Multiple patients may require extended care and rehabilitation, structural damage must be repaired, and disrupted infrastructure must be restored. In a disaster, the immediate impact of physical injury and loss of life and personal property can be overwhelming. Health consequences must be monitored and fully assessed to better understand preventable complications that could be avoided in future disasters. This cannot be accomplished without legally compliant, electronically linked, national, state and regional disaster registries and benchmarks.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

- 3.1 Develop and evaluate processes to ensure that, after a disaster, local health systems (public, private and investor-owned) return as quickly as possible to a state of readiness for routine health care and for future disaster events. These processes must address all components of health care for the public, recognizing that the local health system is part of the critical infrastructure for maintaining both the health of the community and its economic welfare. **(Recommendation for federal/state/local/professional action)**
- 3.2 Require that all governmental and health system entities fully record and evaluate the immediate and long-term consequences to individuals, communities and health systems in after-action and follow-up reports, and establish standardized repositories for data describing these consequences. **(Recommendation for federal/state/local/professional action)**
- 3.3 Develop and evaluate disaster recovery strategies for the timely repair or rebuilding of societal infrastructure for health care, public safety and public health services (e.g., wastewater treatment, potable water supply) and prevention of secondary infections and injuries. **(Recommendation for federal/state/local/professional action)**
- 3.4 Develop and evaluate processes for providing physical and mental health care and rehabilitation and meeting the medical and psychological needs of disaster victims beyond initial life-sustaining care. This includes processes to ensure that short- and long-term programs and services are available (pre- and post-event) to meet the needs of responders and the general public in terms of assuaging stress, grief, fear, panic and anxiety, as well as to address other medical and mental health problems and concerns. **(Recommendation for federal/state/local/professional action)**
- 3.5 Develop and evaluate processes for identification of the deceased and retrieval of human remains

in a disaster. **(Recommendation for federal/state/local/professional action)**

- 3.6 Develop and evaluate prevention strategies for averting or minimizing the effects of subsequent disasters, including effects related to recovery. **(Recommendation for federal/state/local action)**

4.0 Education and training

Each response discipline brings a unique and valuable knowledge base and skill set, both of which contribute importantly to disaster readiness in the community. However, the multitude of responders who arrive at a disaster scene (EMS, firefighters, law enforcement personnel, physicians, dentists, nurses, military personnel and others) typically have different definitions of terms, standards, operation methods and classifications, as well as different experiences and training. Most have minimal understanding of one another's roles and responsibilities in a disaster situation.

All public health and health care personnel and professions have a responsibility to continually prepare themselves to respond to the health and medical needs of the public during disasters. The coordinated and integrated response that communities and the nation as a whole must implement in a disaster makes it critical that public health, EMS and clinical personnel are trained in multidisciplinary settings.

Few national programs have been developed to address, in an all-hazards approach, the important skills, competencies and educational needs in disaster management and response that are common to multiple disciplines. No nationwide standards exist for the training and certification of public health and health care professionals on this subject. Increased efforts are needed to establish and promulgate a baseline set of definitions and competencies, complemented with discipline- and specialty-specific targeted training modules. Realistic, community-wide disaster drills are needed to ensure that responders can recognize the strengths and weaknesses of their disaster planning, mitigation, response, recovery and education programs, and modify them accordingly.

Such efforts must include ordinary citizens who are likely to be among the first to volunteer at a disaster scene and thus serve as a vital link between local EMS and the injured.

By institutionalizing training in emergency preparedness and response throughout the response system, professional organizations can collaborate with state and federal agencies and others to ensure that readiness remains high even during periods of seeming safety and stability. Building a well-trained and well-prepared work force through an all-hazards approach will bolster medical and public health capacity for any emergency, which will truly strengthen health systems and infrastructures.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

- 4.1 Assess and define the knowledge, skills, attitudes and proficiencies needed by health care and public health professionals and others (e.g., citizen responders) for the management of children and adults in day-to-day emergencies and during catastrophic mass casualty events. In accordance with recommendations in the IOM Future of Emergency Care report series,¹⁻³ all health professions schools, institutions and entities responsible for the training, continuing education, credentialing and certification of health professionals should define and incorporate adult and pediatric disaster preparedness and emergency care competencies into discipline-specific educational curricula at the undergraduate, graduate and postgraduate levels. **(Recommendation for federal/state/professional action)**
- 4.2 Assist all health care facilities in partnering with appropriate governmental, public health and emergency response agencies to conduct multidisciplinary, community-wide disaster drills based on local hazard vulnerability analyses to: (a) address acute and chronic health care issues during and after disasters; (b) ensure some operational knowledge prior to a real event; (c) test emergency response plans and procedures; and (d)

demonstrate preparedness at the local level.
**(Recommendation for federal/state/local/
professional action)**

- 4.3 Identify and widely disseminate, or otherwise develop, comprehensive, standardized and competency-based disaster education and training programs (such as the National Disaster Life Support™ Program) for emergency responders, citizen volunteers and other community residents. Such programs should: (a) use an all-hazards approach; (b) cover the full spectrum from prevention and mitigation to response and recovery; (c) provide specific information to address mental health, ethical and legal issues, and the needs of particular at-risk populations (e.g., children, disabled, frail elderly); (d) use a common vocabulary (e.g., glossary of terms and definitions) to provide consistent information across disciplines; (e) provide emergency responders, including citizen volunteers, with a fundamental mutual understanding and working knowledge of their integrated roles and responsibilities at a disaster scene; and (f) allow for portability across state lines.
**(Recommendation for federal/state/local/
professional action)**

- 4.4 Implement a credentialing process to verify that volunteer health professionals responding to a disaster have attained a defined level of knowledge and skill in disaster medicine.
**(Recommendation for federal/state/professional
action)**

5.0 Funding

Health system preparedness requires continued investment in both funding and policymaking if sufficient capacity is to be developed and maintained. This investment must be sustained over time and coordinated at the local, regional, state and national levels. Current federal funding has created a number of “stovepiped” programs that remain poorly integrated and evaluated. Greater congruence and consistency in program guidance from various federal

agencies is necessary, and should focus on shared, crosscutting capabilities. The public health, EMS, nursing, hospital, dental and medical communities can play a pivotal role in educating policymakers and resource allocators on the needs of the system.

Whether man-made or natural, disasters have demonstrated that response capacity rests on collaboration and coordination among local public health departments and private and public health care systems, as well as individual physician practices. After a disaster, affected areas may experience an increased loss of public health and health care resources and personnel. Funding for disaster recovery should prioritize the re-establishment of the private and public health care systems to stimulate economic growth, as well as to prevent and mitigate against further health consequences. Collectively, these assets must be acknowledged as “critical infrastructure” consistent with Homeland Security Presidential Directive-7 (National Infrastructure Protection Plan). As such, the public health and health care systems require significantly increased and sustained funding for disaster preparedness. This is critically important, as the current capacity for routine health care delivery is already severely over-leveraged.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

- 5.1 Advocate congressional action for the immediate increase in federal funding to develop, improve, expand and sustain emergency medical, trauma care and disaster health preparedness systems nationwide. Stable, dedicated funding is needed to ensure the emergency and critical care infrastructure and capacity to respond to disasters, as the current day-to-day health system already is functioning at overcapacity.
**(Recommendation for congressional/federal/state/
local/professional action)**
- 5.2 Require that state and federal funding for economic recovery from disasters prioritize the re-establishment of the public health and health

care systems to promote economic growth and mitigate long-term medical and mental health consequences to affected populations.

(Recommendation for congressional/federal/state action)

5.3 Provide less prescriptive and more flexible federal funding for all-hazards health system preparedness, while ensuring that state legislatures and municipal and tribal governments remain accountable for the appropriate use and dissemination of the funds. **(Recommendation for congressional/federal/state action)**

5.4 Fund ongoing multidisciplinary training, exercises and drills to measure state, regional and local capacity to implement and adapt all-hazards disaster preparedness and response plans and ensure that response capability meets the expectations of the public. **(Recommendation for congressional/federal/state/local action)**

5.5 Create and fund a national public-private entity (representing federal, military, tribal, medical, dental, nursing, EMS, hospital, public health and other appropriate entities) to monitor national health system preparedness efforts and activities. **(Recommendation for congressional/federal/professional action)**

5.6 Establish an oversight and review process to better coordinate grant programs across multiple federal agencies to address gaps, reduce redundancy and enhance consistency of program objectives and outcomes for strengthening preparedness among state and local EMS, public health and acute care systems. **(Recommendation for congressional/federal action)**

5.7 Review existing reimbursement and financing systems, such as Medicare and Medicaid, for the provision of medical care in a mass casualty event. **(Recommendation for congressional/federal/state/professional action)**

5.8 Implement recommendations in the IOM Future of Emergency Care report series¹⁻³ by funding the U.S. Department of Health and Human Services or another appropriate federal agency to convene meetings of multidisciplinary experts to: (a) develop evidence-based indicators of EMS and trauma care system performance, including performance of pediatric emergency care; and (b) develop an evidence-based categorization process for EMS systems, emergency departments and trauma care centers based on adult and pediatric service capabilities. **(Recommendation for congressional/federal action)**

5.9 Implement recommendations in the IOM Emergency Care for Children report⁴ by funding the U.S. Department of Health and Human Services or another appropriate federal agency to convene meetings of multidisciplinary experts to develop strategies for addressing pediatric needs in a disaster. In partnership with state and regional planning bodies and emergency care providers, this effort should encompass the: (a) updating of pediatric emergency care clinical practice guidelines and standards of care; (b) development of strategies to minimize parent-child separation and improved methods for reuniting separated children with their families; (c) development of strategies to improve the level of pediatric expertise on Disaster Medical Assistance Teams and other organized disaster response teams; (d) development of disaster plans that address pediatric surge capacity for both injured and noninjured children; and (e) development of, and improved access to, specific medical and mental health therapies, as well as social services, for children in the event of a disaster. **(Recommendation for congressional/federal action)**

6.0 Health system surge capacity

When a disaster affects a community, local emergency responders, government agencies and private organizations will take action to save lives and help the population cope with the crisis. Health care facilities will be confronted with increased demands for human

resources, both short- and long-term; adequate personal protective equipment for staff; trauma and burn care; mortuary services; and mental health care. Additional demands will be placed on hospital pharmacies, laboratory and diagnostic services, patient transport, dietary services, housekeeping and physical plant services. A major challenge will be the appropriate distribution of seriously or critically ill patients to area or regional medical facilities. For necessary medical treatment in a disaster, the public will expect the highest possible standard of care consistent with the availability of health care resources. The public also will expect that the best available treatments be offered in circumstances in which the short-term lack of emergency and critical care services requires the application of alternative standards of care.

Presently, many hospital emergency departments in the United States are severely overcrowded. In many cities, the emergency care system is already functioning at or beyond saturation on a daily basis. This will make it difficult or impossible to gain the surge capacity needed to sustain community health care systems during a mass casualty event. Valid and reliable models are urgently needed to predict and provide surge capability of health care systems and should be a priority for state and local emergency response planners. This includes specific attention to the needs of children, who are more vulnerable to the consequences of disasters than adults, both physiologically and psychologically.

Regional health care systems best understand their own needs and resources, and must therefore develop their own disaster medical surge capabilities. This is particularly important since federal and other deployable assets may not be available for the first 24 to 72 hours after a disaster. To meet community health needs, state and local agencies must provide adequate equipment, facilities, medical transportation and appropriately trained personnel, including laboratory technicians, environmental health professionals, social workers, mental health professionals and epidemiologists. Volunteer resources, such as the

American Red Cross, Medical Reserve Corps and Community Emergency Response Teams (CERTs), provide a support network of community-based health professionals and citizen responders who are trained to provide emergency care and can be integrated appropriately into local response efforts. Coordination of resources and assets needs to be addressed through an integrated planning process that involves all elements and levels of the response system.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

- 6.1 Charge and adequately fund the IOM to perform a comprehensive study of health system surge capacity, with recommendations for developing, improving and expanding the capability of all health systems to prepare for, respond to and recover from disasters. **(Recommendation for congressional/federal action)**
- 6.2 Develop and disseminate model plans and strategies, based on findings from authoritative groups such as the IOM, for addressing health system surge capability for general and special populations during disasters. Comprehensive strategies are needed, including but not limited to: (a) general and event-specific triage, transport, and sheltering guidelines and measures, including guidance for children and other vulnerable or underserved populations who may require special equipment or modified approaches to care; (b) rapid community-needs assessment to ensure that vital and specific needs of all affected community members are being met; (c) management of human resources; and (d) guidelines for the allocation of scarce medical resources, such as ventilators, burn beds or surgical suites. In developing these strategies, it is critically important to make use of regionalization to leverage resources and work force capabilities for children, youth and adults. **(Recommendation for federal/state/local/professional action)**

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- 6.3 Develop a community-wide inventory of potential surge capacity assets in the public health and health care response sectors, and define the range of their potential assistance (e.g., dentistry has much to offer, in personnel and facilities, when a community’s traditional medical resources are overwhelmed). After these assets are defined, training modules should be developed and deployed to teach response personnel the basics of their surge roles, as well as the importance of working within the incident command system. **(Recommendation for federal/state/local/professional action)**
- 6.4 Expand efforts to engage and utilize health professionals in formally organized and trained volunteer emergency response teams (such as the Medical Reserve Corps) to supplement existing medical and public health resources within state boundaries and across state lines. Professional medical and public health organizations should promote such efforts and provide information to interested members on how to become more involved in local volunteer initiatives. **(Recommendation for federal/state/local/professional action)**
- 6.5 Ensure that local emergency response plans provide for the distribution of patients throughout the acute care system and to neighboring regions or states (even if this deviates from standard EMS or hospital procedures). The overarching intent is to provide the best possible care to the largest number of victims in the shortest time. This requires that all hospitals meet specified criteria for treating infants and children in emergencies, and drill periodically to reinforce needed competencies. While all communities or regions do not have access to pediatric trauma centers, when possible and appropriate, children should be sent to these facilities. **(Recommendation for federal/state/local/professional action)**
- 6.6 Establish and use common terminology and definitions for various concepts associated with

surge capacity (e.g., What is a “bed”? What is an “overflow bed”? What is “surge capacity”?).

(Recommendation for federal/state/local/professional action)

- 6.7 Ensure state and local public health and health care entities have an active, if not a leadership, role in planning for surge capacity in their states and communities for the management of mass casualties from a disaster or other public health emergency. **(Recommendation for state/local/professional action)**
- 6.8 Expand efforts to train and utilize non-health professionals, such as through American Red Cross chapters and CERTs, to provide a network of community-based volunteers who can provide emergency care but who must be integrated appropriately into local disaster response plans. **(Recommendation for federal/state/local/professional action)**

7.0 Legislation and regulation

Response to a disaster may require the imposition of emergency public health measures such as quarantine, isolation, closure of public places, seizure of property, mandatory vaccination, travel restrictions and disposal of human remains. States and municipalities may encroach on some of the civil rights of disaster victims in order to promote the public welfare by a safe and expeditious response to the emergency situation. The ability to act in the best interests of the people provides a municipality and/or state broad discretion in how it responds to an emergency situation or disaster, and derives from the police power of the municipality and state. State and local health authorities should review statutes, regulations and ordinances that authorize these emergency measures and ensure legally sound procedures for executing them.

Disaster situations often involve mobilization of large numbers of health care personnel from many states, raising questions about the “practice of medicine” and scope of practice in jurisdictions where an individual

is not licensed. Ensuring proper licensure and credentialing has legal implications both for health care volunteers and hospitals utilizing their services. While the commonly held “Good Samaritan Doctrine” is designed to encourage people to stop and render aid to those in need, every state recognizes the duties and potential liabilities under this doctrine somewhat differently. Local and state authorities do not necessarily have the means by which to protect volunteers against disclosure of personal information contained in a registry, liability for actions taken while responding to an emergency, uncompensated personal injury incurred while responding to an emergency, or compromised employment status as a result of temporary relocation. Whether man-made or natural, disasters have demonstrated prohibitive challenges in current government policy with regard to medical liability, standards of care and license reciprocity to enable volunteer health professionals to participate in disaster response.

Presently, state, public health and hospital authorities do not have a systematic mechanism for registering and credentialing health care volunteers for emergency or disaster response. Nationally integrated, fully interoperable, technologically based systems for the rapid deployment of properly educated, duly licensed and certified, disaster-credentialed and privileged, and collectively indemnified health care professionals must be made available to proper authorities in states where declared disasters occur.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

7.1 Advocate congressional, presidential and gubernatorial support for the creation of a comprehensive legal framework for the provision and indemnification of health and mental health care by health care professionals who are licensed, recognized or certified in jurisdictions other than those in which medical disasters may occur. Government policies must accommodate complex issues, such as medical liability and licensure portability, to enable volunteer health

professionals to participate in disaster response and yet maintain the highest possible standards of care under extreme conditions.

(Recommendation for congressional/state/local/professional action)

- 7.2 Establish an integrated system that provides the necessary funding, technology, data standards and mechanisms to ensure the confidential and accurate registration and verification of credentials of emergency responders prior to and during a disaster. Oversight of this system needs to involve public (local, state and federal) and private agencies and organizations. **(Recommendation for federal/state/professional action)**
- 7.3 In coordination with the U.S. Department of Homeland Security, the U.S. Department of Defense and other appropriate federal agencies, designate the U.S. Department of Health and Human Services with lead responsibility for strengthening the federal government’s capability to provide medical and public health support during a disaster. **(Recommendation for congressional/federal action)**
- 7.4 Direct that all hospitals have access to and begin to implement specified criteria for treating vulnerable populations including children in emergencies; these criteria should be validated through exercises and periodic comprehensive drills to reinforce expected competencies. **(Recommendation for federal/state/local action)**

8.0 Research

Federal investment to prepare the nation against terrorism and other health threats must be validated through objective confirmation of the effectiveness of efforts. Health system preparedness decision-making must be based on research that assesses the cost-benefit of efforts, quantifies specific obstacles, guides solutions, informs interventions and best practices, analyzes and forecasts threats and vulnerabilities, and develops performance metrics.

Developing an evidence base for health system preparedness requires examining how the health system operates in the context of the entire community response. The best way to develop evidence of what is needed for a successful public health and medical response is an iterative process of planning and conducting realistic disaster drills and exercises. This entails making a community-wide plan that involves all relevant responders, training them for their role in executing the plan, implementing the plan on a large scale, developing an after-action report to evaluate the plan, changing the plan as appropriate, and testing it again to determine whether the changes were effective. Through this process, it will then be possible to identify which inputs affected the outcome.

There is no substitute for health system research based on real experience in actual communities. Best practices and benchmarks for health system performance will not be meaningful unless that performance is evaluated in the context of where it will really happen—in realistic scenarios that involve a community’s entire emergency management system, operating as required under the National Response Plan and compliant with the National Incident Management System. Ensuring preparedness through scientific methods and evidence is fundamental, urgently needed and essential.

The science of disaster management remains in the early stages of development like much of health systems research. A robust research agenda is needed to ensure that an evidence-based approach is used to solve problems and respond effectively to disasters and mass casualty events. This will ensure that best care is received and that trade-offs, which usually occur in these situations, are addressed in a responsible manner using the best available knowledge. Numerous professional organizations have proposed research agendas for disaster medicine, nursing, mental health and public health, which should be combined into a single national research agenda to guide federal agencies in funding scientific investigation.

To address this priority issue, we recommend the combined efforts of government and private sector health system agencies and organizations to:

- 8.1 Support evidence-based research on the efficacy and effectiveness of immediate and long-term medical and mental health treatments, systems of care for acute and chronic disaster-related illnesses and injuries, and best practices for translating and disseminating the results of such research into disaster medical care and disaster risk communication. This requires investigation, documentation and evaluation of real-world experiences of health care delivery in crisis situations, including those in which “usual” public health and medical care standards are suspended or impossible to maintain. **(Recommendation for congressional/federal/state/professional action)**
- 8.2 Support collaborative efforts among all appropriate public and private sector stakeholders to develop priorities for a national disaster medical research agenda derived from various extant proposals. **(Recommendation for federal/professional action)**
- 8.3 Critically assess the adequacy of resources, personnel, education and training for the medical and public health response to mass casualty incidents. This includes research to address the surge capability necessary to meet the needs of general and special populations, including children, the poor, the elderly and the disabled; to determine methods for, and outcomes of, rationing scarce resources; to determine best educational methods for teaching all levels of responders, including the public; and to evaluate the effectiveness of expanding mutual aid agreements with neighboring regions, states and nations under various disaster scenarios and conditions. **(Recommendation for federal/state/professional action)**
- 8.4 Implement and evaluate standardized surveillance programs, based on federal and state guidelines, for effectiveness in monitoring and sharing information about illness and injury patterns and

trends (e.g., by age, gender and geographic distribution). **(Recommendation for federal/state/local action)**

- 8.5 Establish baseline all-hazards standards or guidelines for defining and measuring health system preparedness for disasters. Nationally accepted metrics and performance measures should be developed for assessing and monitoring state and local response capacities and capabilities and for accounting of federal preparedness funds. **(Recommendation for federal/state/local/professional action)**

Take-home messages and most critical recommendations

In follow-up meetings to the AMA/APHA Linkages Leadership Summit, organizational participants identified the following key messages and recommendations to serve as the initial components of a coordinated national advocacy agenda for improving health system preparedness for terrorism and other disasters.

Message 1:

Public health and health care systems must be appropriately funded and protected as critical infrastructure for responding to day-to-day emergencies and catastrophic mass casualty events.

Congressional action is urgently needed for the immediate increase in federal funding to develop, improve, expand and sustain emergency medical, trauma care and disaster health preparedness systems nationwide. Stable, dedicated funding is needed to ensure the emergency and critical care infrastructure and capacity to respond to disasters, as the current day-to-day health system already is functioning at overcapacity. **(Recommendation 5.1)**

All appropriate governmental and health system entities nationwide must develop and evaluate processes to ensure that, after a disaster, local health systems return as quickly as possible to a state of readiness for routine health care and for future disaster events. These processes must address all components of health care for the public, recognizing that the local health system is part of the critical infrastructure for maintaining both the health of the community and its economic welfare. **(Recommendation 3.1)**

Funding for economic recovery from disasters must prioritize the re-establishment of the public health and health care systems to promote economic growth and mitigate long-term medical and mental health consequences to affected populations. **(Recommendation 5.2)**

The Institute of Medicine (IOM) should be charged and adequately funded to perform a comprehensive study of health system surge capacity, with recommendations for developing, improving and expanding the capability of all health systems to prepare for, respond to and recover from disasters. **(Recommendation 6.1)**

Message 2:

Public health and health care disaster preparedness and response systems must be fully integrated and interoperable at all government levels.

All governmental and health system entities and professional organizations must support continued progress toward the full integration of emergency and disaster preparedness with public health and health care systems nationwide with respect to emergency and trauma care. Important first steps are the IOM recommendation to establish a lead agency for emergency and trauma care, and the federal mandate to foster interagency collaboration among emergency and trauma care services at the national disaster response level via the Federal Interagency Committee on Emergency Medical Services and related advisory bodies. **(Recommendation 1.1)**

All governmental and health system emergency and disaster preparedness planning, mitigation, response and recovery operations, including unified incident command and the emergency operations center, must include the direct participation of public health and health care professionals. **(Recommendation 1.2)**

All governmental and health system entities nationwide must require that health disaster communications and health information exchange networks be fully integrated and functionally interoperable at every level of government and health systems. **(Recommendation 2.1)**

Message 3:
Public health and health care professionals should maintain an appropriate level of proficiency in disaster preparedness and response through the incorporation of competency-based education and training in undergraduate, graduate, postgraduate and continuing education programs.

All appropriate governmental and health system entities and professional organizations must develop and disseminate health competencies for the management of adult and pediatric patients, both for day-to-day emergencies and for catastrophic events. Appropriate educational accreditation agencies must facilitate incorporation of these competencies into both discipline-specific educational curricula and maintenance of competency programs at the undergraduate, graduate and postgraduate levels. **(Recommendation 4.1)**

Message 4:
Public health and health care responders must be provided and assured adequate legal protections in a disaster.

Congressional, presidential and gubernatorial support is needed for the creation of a comprehensive legal framework for the provision and indemnification of health and mental health care by health professionals who are licensed, recognized or certified in jurisdictions other than those in which medical disasters may occur. Government policies must address issues of medical liability, standards and alternate standards of care, and license reciprocity to enable volunteer health professionals to participate in disaster response. **(Recommendation 7.1)**

A pledge of commitment

With these recommendations, summit participants invite colleagues and legislators across the country to join in advocating a shared policy agenda, as a national call to action, to enable the public health and health care systems to become truly interoperable and integrated, with adequate resources, facilities and training to better coordinate their assigned tasks. In support of this initiative, participating organizations have signed a pledge of commitment to four overarching principles: (1) to provide leadership in national, state and community disaster planning and response efforts; (2) to assist state and local affiliates and individual members with “putting disaster preparedness into practice”; (3) to promote multidisciplinary disaster education and training programs; and (4) to ensure national support and advocacy for solutions through research, public policy, legislation and funding.

Improving health system preparedness for terrorism and mass casualty events

A commitment from medicine, dentistry, nursing, emergency medical services, hospital systems and public health to improve health system preparedness for terrorism and mass casualty incidents

We in the health professions pledge to make health system preparedness one of our highest priorities. Working with educators, legislators, social workers, firefighters, law enforcement, business, community groups, clergy and others, we will support national, state and local efforts to strengthen individual and community preparedness, response and resilience to terrorism and other catastrophic events.

Together, we will work to enable the public health and health care systems to become truly interoperable and integrated, with adequate resources, facilities and training to better coordinate their assigned tasks. As scientists, public servants and humanitarians, we will incorporate everything possible into our professional and advocacy efforts to protect public health and safety in a disaster. We resolve to:

Provide leadership *in national, state and local disaster planning and response efforts.*

We will increase our participation in coalitions and programs to further develop and strengthen health system preparedness and ensure that the medical and mental health needs of all populations are addressed. We will work with state and federal agencies and others to ensure that readiness remains high even during periods of seeming safety and stability.

Put disaster preparedness into practice.

We will work together to develop and disseminate resources to help health professionals educate and inform patients and community residents about disaster preparedness, as well as motivate our colleagues to become more involved in local volunteer response efforts. We also will talk with patients, colleagues and community groups about potential hazards and how best to protect themselves and others in an emergency.

Educate ourselves *about disaster preparedness and response.*

Collectively, we will work to incorporate disaster training throughout the health response system. Building a well-trained and well-prepared health work force through an all-hazards approach will bolster medical and public health capacity for any emergency, which will truly strengthen the health infrastructure. As part of our professional development, we will learn to provide culturally competent and supportive guidance and education to patients and family members affected by disasters. In addition, we will become informed about local resources and referral services for victims and others affected by such events.

Advocate for solutions *based on sound science.*

We will work with local, state and federal policymakers to increase resources dedicated to a comprehensive, coordinated and evidence-based health systems approach to disaster prevention, mitigation, response and recovery.

Appendix A: Summary chart of summit recommendations with designation of responsible entities

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Collaboration, coordination and planning</i>					
1.1 Expedite progress nationwide in integrating all aspects of the health systems responsible for emergency and trauma care in a disaster. As important first steps, this requires implementation of the recommendation in the Institute of Medicine (IOM) Future of Emergency Care report series, which calls for the establishment of a lead agency for emergency and trauma care, and the federal mandate to foster interagency collaboration among emergency and trauma care services at the national disaster medical response level via the Federal Interagency Committee on Emergency Medical Services and related advisory bodies. The locus of responsibility for effective coordination of all federal agencies involved in disaster response should reside in an agency normally involved in the routine response to day-to-day emergencies, upon which the catastrophic medical disaster response must be built.	x	x	x		x
1.2 Ensure direct involvement of public health and health care professionals in all governmental and health system emergency and disaster preparedness planning, mitigation, response and recovery operations; require their active participation at all incident command and emergency operation center activations, responses and exercises to provide public health and medical guidance. Public health and health care systems have a distinct and important role to play in all phases and types of disasters and should be part of the critical infrastructure and unified incident command of all multidisciplinary responses.	x	x	x		x
1.3 Require an all-hazards approach in the development of public health and health care disaster preparedness and response plans to address day-to-day and catastrophic emergencies, as well as the unique needs of special/vulnerable populations (e.g., children, elderly, disabled) and tribal nations.	x	x	x		

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Collaboration, coordination and planning, continued</i>					
1.4 To the extent possible, enhance portability and sustainability between the emergency response and acute care systems through identification, availability and use of standardized equipment and protocols for communications, personal protection and agent detection, as well as for medical and operational emergency preparedness (especially in terms of field triage and treatment rules) throughout the duration of an emergency event.	x		x	x	
1.5 Use local and state public health agencies as a visible nexus for coordinating acute care facilities, the EMS system, individual health care practitioners, local community groups and public health resources with other governmental agencies, including emergency management, fire and law enforcement.	x		x	x	
1.6 At least annually, engage public health and health care professionals in evaluating all-hazards emergency preparedness and response plans through drills and other exercises in collaboration with state and local emergency management and public safety agencies. Drills and exercises should be designed to stress the community system-level response over time, and should address event notification, communication, resource allocation and patient management. In accordance with the IOM Emergency Care for Children report, disaster drills should include a pediatric mass casualty incident at least once every two years.	x		x	x	

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Collaboration, coordination and planning, continued</i>					
1.7 Engage public health and health care personnel and their professional associations in ongoing dialogue at the local, regional, state and tribal levels to identify and develop mutual efforts within their communities, regions and states to strengthen day-to-day health system preparedness and emergency response capacities and capabilities. This includes development of model plans and coordinated strategies, taking into account best practices and lessons learned for enhancing community, regional and state health and emergency response to disasters, with emphasis on a multidisciplinary approach. Joint consensus documents should be developed to clearly delineate the roles and responsibilities of each community response sector and identify the unique resources each group brings to an organized and efficient emergency response for the jurisdiction.			x	x	x
1.8 Promote collaboration among appropriate state and federal agencies, tribal authorities, and health care organizations in the development and initiation of national stakeholder group meetings to address health system preparedness. These meetings should focus on understanding the mission, lexicon and functions of multiple specialty groups; identifying opportunities for collaboration at the local, state, tribal and national levels; and promoting mutual respect across all response sectors.	x		x		x
1.9 Recognize the contributions and improve the integration of citizen volunteers and nongovernmental organizations into federal, state, regional and local disaster planning and response efforts.	x		x	x	
1.10 Encourage national professional organizations to direct their state and local affiliates to become involved in planning for the health and medical response to disasters at the state and local levels (through Web sites, newsletters, policy statements, and other communication and advocacy efforts).					x

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Communications and information exchange</i>					
2.1 Require that disaster communication and health information exchange systems and protocols be fully integrated and functionally interoperable at all emergency response levels. Reliable, real-time networks must be available for use among hospitals, EMS agencies, public safety departments, emergency management offices and government agencies during day-to-day operations, as well as during a disaster to improve situational awareness, enhance victim treatment and ensure efficient transport to definitive care facilities.	x	x	x	x	x
2.2 Ensure that public health and health care systems nationwide actively collaborate with the media, religious and civic leaders, and policymakers to accurately inform and educate the public about potential risks and effective coping strategies associated with disasters. Such information should be provided both pre- and post-event to enhance individual and community resiliency.	x	x	x	x	x
2.3 Establish effective, real-time data systems to capture and share medical and public health information. This includes: (a) acceleration of initiatives to develop, implement and foster widespread use of interoperable electronic health record systems to support emergency responders and health professionals and improve the quality and efficacy of patient care; (b) improvement of syndromic surveillance systems, disease and injury reporting, and electronic connectivity of public health and EMS agencies and hospitals throughout all disaster medical response phases; and (c) implementation of early notification and warning systems to identify possible risks based on trends.	x	x	x	x	x
2.4 Ensure that all community responder groups know how to implement and use patient tracking systems to access information on family members or friends believed to be patients as a result of the disaster. Available systems (e.g., the American Red Cross Patient Connection Program) should be integrated to maximize efficiency. Public service announcements should be developed to instruct the public on how to access such systems.	x	x	x	x	x

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Communications and information exchange, continued</i>					
2.5 Develop and disseminate consistent information for public health and health care professionals and the public describing the policies, roles and legal authority of state and local public health agencies during a disaster (e.g., authority to activate or enforce quarantine and isolation).		x	x	x	x
2.6 Provide opportunities for debriefing and information sharing—both internally and externally—on hospital, community, regional and state response to actual disasters as well as disaster drills and exercises, with implementation of a plan to address identified gaps in response plans and protocols, and appropriate follow-up for continuous quality improvement.		x	x	x	
2.7 Increase access to and availability of appropriately trained public health personnel in hospitals and other medical treatment facilities to assist in disease and injury reporting and surveillance activities.			x	x	

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Disaster recovery and health systems</i>					
3.1 Develop and evaluate processes to ensure that, after a disaster, local health systems (public, private and investor-owned) return as quickly as possible to a state of readiness for routine health care and for future disaster events. These processes must address all components of health care for the public, recognizing that the local health system is part of the critical infrastructure for maintaining both the health of the community and its economic welfare.		x	x	x	x

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Disaster recovery and health systems, continued</i>					
3.2 Require that all governmental and health system entities fully record and evaluate the immediate and long-term consequences to individuals, communities and health systems in after-action and follow-up reports, and establish standardized repositories for data describing these consequences.	x	x	x	x	x
3.3 Develop and evaluate disaster recovery strategies for the timely repair or rebuilding of societal infrastructure for health care, public safety and public health services (e.g., wastewater treatment, potable water supply) and prevention of secondary infections and injuries.	x	x	x	x	x
3.4 Develop and evaluate processes for providing physical and mental health care and rehabilitation and meeting the medical and psychological needs of disaster victims beyond initial life-sustaining care. This includes processes to ensure that short- and long-term programs and services are available (pre- and post-event) to meet the needs of responders and the general public in terms of assuaging stress, grief, fear, panic and anxiety, as well as to address other medical and mental health problems and concerns.	x	x	x	x	x
3.5 Develop and evaluate processes for identification of the deceased and retrieval of human remains in a disaster.	x	x	x	x	x
3.6 Develop and evaluate prevention strategies for averting or minimizing the effects of subsequent disasters, including effects related to recovery.	x	x	x		

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Education and training</i>					
4.1 Assess and define the knowledge, skills, attitudes and proficiencies needed by health care and public health professionals and others (e.g., citizen responders) for the management of children and adults in day-to-day emergencies and during catastrophic mass casualty events. In accordance with recommendations in the IOM Future of Emergency Care report series, all health professions schools, institutions and entities responsible for the training, continuing education, credentialing and certification of health professionals should define and incorporate adult and pediatric disaster preparedness and emergency care competencies into discipline-specific educational curricula at the undergraduate, graduate and postgraduate levels.		x	x		x
4.2 Assist all health care facilities in partnering with appropriate governmental, public health and emergency response agencies to conduct multidisciplinary, community-wide disaster drills based on local hazard vulnerability analyses to: (a) address acute and chronic health care issues during and after disasters; (b) ensure some operational knowledge prior to a real event; (c) test emergency response plans and procedures; and (d) demonstrate preparedness at the local level.		x	x	x	x
4.3 Identify and widely disseminate, or otherwise develop, comprehensive, standardized and competency-based disaster education and training programs (such as the National Disaster Life Support Program) for emergency responders, citizen volunteers and other community residents. Such programs should: (a) use an all-hazards approach; (b) cover the full spectrum from prevention and mitigation to response and recovery; (c) provide specific information to address mental health, ethical and legal issues, and the needs of particular at-risk populations (e.g., children, disabled, frail elderly); (d) use a common vocabulary (e.g., glossary of terms and definitions) to provide consistent information across		x	x	x	x
<i>(Continued on next page)</i>					

disciplines; (e) provide emergency responders, including citizen volunteers, with a fundamental mutual understanding and working knowledge of their integrated roles and responsibilities at a disaster scene; and (f) allow for portability across state lines.				
4.4 Implement a credentialing process to verify that volunteer health professionals responding to a disaster have attained a defined level of knowledge and skill in disaster medicine.	x	x		x

Recommendation directed at:

Strategic recommendations	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
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<i>Funding</i>					
5.1 Advocate congressional action for the immediate increase in federal funding to develop, improve, expand and sustain emergency medical, trauma care and disaster health preparedness systems nationwide. Stable, dedicated funding is needed to ensure the emergency and critical care infrastructure and capacity to respond to disasters, as the current day-to-day health system already is functioning at overcapacity.	x	x	x	x	x
5.2 Require that state and federal funding for economic recovery from disasters prioritize the re-establishment of the public health and health care systems to promote economic growth and mitigate long-term medical and mental health consequences to affected populations.	x	x	x		
5.3 Provide for less prescriptive and more flexible federal funding for all-hazards health system preparedness, while ensuring that state legislatures and municipal and tribal governments remain accountable for the appropriate use and dissemination of the funds.	x	x	x		
5.4 Fund ongoing multidisciplinary training, exercises and drills to measure state, regional and local capacity to implement and adapt all-hazards disaster preparedness and response plans and ensure that response capability meets the expectations of the public.	x	x	x	x	

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Funding, continued</i>					
5.5 Create and fund a national public-private entity (representing federal, military, tribal, medical, dental, nursing, EMS, hospital, public health and other appropriate entities) to monitor national health system preparedness efforts and activities.	x	x			x
5.6 Establish an oversight and review process to better coordinate grant programs across multiple federal agencies to address gaps, reduce redundancy and enhance consistency of program objectives and outcomes for strengthening preparedness among state and local EMS, public health and acute care systems.	x	x			
5.7 Review existing reimbursement and financing systems, such as Medicare and Medicaid, for the provision of medical care in a mass casualty event.	x	x	x		x
5.8 Implement recommendations in the IOM Future of Emergency Care report series by funding the U.S. Department of Health and Human Services or another appropriate federal agency to convene meetings of multidisciplinary experts to: (a) develop evidence-based indicators of EMS and trauma care system performance, including performance of pediatric emergency care; and (b) develop an evidence-based categorization process for EMS systems, emergency departments and trauma care centers based on adult and pediatric service capabilities.	x	x			

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Funding, continued</i>					
5.9 Implement recommendations in the IOM Emergency Care for Children report by funding the U.S. Department of Health and Human Services or another appropriate federal agency to convene meetings of multidisciplinary experts to develop strategies for addressing pediatric needs in a disaster. In partnership with state and regional planning bodies and emergency care providers, this effort should encompass the: (a) updating of pediatric emergency care clinical practice guidelines and standards of care; (b) development of strategies to minimize parent-child separation and improved methods for reuniting separated children with their families; (c) development of strategies to improve the level of pediatric expertise on Disaster Medical Assistance Teams and other organized disaster response teams; (d) development of disaster plans that address pediatric surge capacity for both injured and noninjured children; and (e) development of, and improved access to, specific medical and mental health therapies, as well as social services, for children in the event of a disaster.	x	x			

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Health system surge capacity</i>					
6.1 Charge and adequately fund the IOM to perform a comprehensive study of health system surge capacity, with recommendations for developing, improving and expanding the capability of all health systems to prepare for, respond to and recover from disasters.	x	x			

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Health system surge capacity, continued</i>					
6.2 Develop and disseminate model plans and strategies, based on findings from authoritative groups such as the IOM, for addressing health system surge capability for general and special populations during disasters. Comprehensive strategies are needed, including but not limited to: (a) general and event-specific triage, transport, and sheltering guidelines and measures, including guidance for children and other vulnerable or underserved populations who may require special equipment or modified approaches to care; (b) rapid community-needs assessment to ensure that vital and specific needs of all affected community members are being met; (c) management of human resources; and (d) guidelines for the allocation of scarce medical resources, such as ventilators, burn beds or surgical suites. In developing these strategies, it is critically important to make use of regionalization to leverage resources and work force capabilities for children, youth and adults.	x	x	x		x
6.3 Develop a community-wide inventory of potential surge capacity assets in the public health and health care response sectors, and define the range of their potential assistance (e.g., dentistry has much to offer, in personnel and facilities, when a community's traditional medical resources are overwhelmed). After these assets are defined, training modules should be developed and deployed to teach response personnel the basics of their surge roles, as well as the importance of working within the incident command system.	x	x	x		x
6.4 Expand efforts to engage and utilize health professionals in formally organized and trained volunteer emergency response teams (such as the Medical Reserve Corps) to supplement existing medical and public health resources within state boundaries and across state lines. Professional medical and public health organizations should promote such efforts and provide information to interested members on how to become more involved in local volunteer initiatives.	x	x	x		x

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Health system surge capacity, continued</i>					
6.5 Ensure that local emergency response plans provide for the distribution of patients throughout the acute care system and to neighboring regions or states (even if this deviates from standard EMS or hospital procedures). The overarching intent is to provide the best possible care to the largest number of victims in the shortest time. This requires that all hospitals meet specified criteria for treating infants and children in emergencies, and drill periodically to reinforce needed competencies. While all communities or regions do not have access to pediatric trauma centers, when possible and appropriate, children should be sent to these facilities.	x		x	x	x
6.6 Establish and use common terminology and definitions for various concepts associated with surge capacity (e.g., What is a “bed”? What is an “overflow bed”? What is “surge capacity”?).	x		x	x	x
6.7 Ensure state and local public health and health care entities have an active, if not a leadership, role in planning for surge capacity in their states and communities for the management of mass casualties from a disaster or other public health emergency.			x	x	x
6.8 Expand efforts to train and utilize non-health professionals, such as through American Red Cross chapters and Community Emergency Response Teams, to provide a network of community-based volunteers who can provide emergency care but who must be integrated appropriately into local disaster response plans.	x		x	x	x

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Legislation and regulation</i>					
7.1 Advocate congressional and presidential support for the creation of a comprehensive legal framework for the provision and indemnification of health and mental health care by health care professionals who are licensed, recognized or certified in jurisdictions other than those in which medical disasters may occur. Government policies must accommodate complex issues, such as medical liability and licensure portability, to enable volunteer health professionals to participate in disaster response and yet maintain the highest possible standards of care under extreme conditions.	x		x	x	x
7.2 Establish an integrated system that provides the necessary funding, technology, data standards and mechanisms to ensure the confidential and accurate registration and verification of credentials of emergency responders prior to and during a disaster. Oversight of this system needs to involve public (local, state and federal) and private agencies and organizations.		x	x		x
7.3 In coordination with the U.S. Department of Homeland Security, the U.S. Department of Defense and other appropriate federal agencies, designate the U.S. Department of Health and Human Services with lead responsibility for strengthening the federal government’s capability to provide medical and public health support during a disaster.	x	x			
7.4 Direct that all hospitals have access to and begin to implement specified criteria for treating vulnerable populations including children in emergencies; these criteria should be validated through exercises and periodic comprehensive drills to reinforce expected competencies.		x	x	x	

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Research</i>					
8.1 Support evidence-based research on the efficacy and effectiveness of immediate and long-term medical and mental health treatments, systems of care for acute and chronic disaster-related illnesses and injuries, and best practices for translating and disseminating the results of such research into disaster medical care and disaster risk communication. This requires investigation, documentation and evaluation of real-world experiences of health care delivery in crisis situations, including those in which “usual” public health and medical care standards are suspended or impossible to maintain.	x	x	x		x
8.2 Support collaborative efforts among all appropriate public and private sector stakeholders to develop priorities for a national disaster medical research agenda derived from various extant proposals.		x			x
8.3 Critically assess the adequacy of resources, personnel, education and training for the medical and public health response to mass casualty incidents. This includes research to address the surge capability necessary to meet the needs of general and special populations, including children, the poor, the elderly and the disabled; to determine methods for, and outcomes of, rationing scarce resources; to determine best educational methods for teaching all levels of responders, including the public; and to evaluate the effectiveness of expanding mutual aid agreements with neighboring regions, states and nations under various disaster scenarios and conditions.		x	x		x
8.4 Implement and evaluate standardized surveillance programs, based on federal and state guidelines, for effectiveness in monitoring and sharing information about illness and injury patterns and trends (e.g., by age, gender and geographic distribution).		x	x	x	

Strategic recommendations	Recommendation directed at:				
	Congress	Federal agencies	State agencies	Local agencies	Professional organizations
<i>Research, continued</i>					
8.5 Establish baseline all-hazards standards or guidelines for defining and measuring health system preparedness for disasters. Nationally accepted metrics and performance measures should be developed for assessing and monitoring state and local response capacities and capabilities and for accounting of federal preparedness funds.		x	x	x	x

Appendix B: Glossary

Acute care system—Network of hospitals, clinics, private offices and other health care facilities staffed and equipped to provide immediate medical, mental health and surgical care to ill and injured patients.

All-hazards preparedness—An all-hazards approach does not focus on specific hazards but concentrates on a solid framework that ensures jurisdictions will be better prepared for all disasters. All-hazards preparedness refers to preparedness for natural (e.g., hurricanes, earthquakes, floods), unintentional (e.g., highway crashes, epidemics), and deliberate (e.g., terrorism) events that have the destructive capability to cause multiple or mass casualties.

Certification—An external verification process (e.g., formal examination) for attesting that an individual meets established competencies and professional standards.

Competency-based education—Focuses on the application of knowledge to produce observable outcomes or behaviors and is characterized by increased workplace relevance and applicability. A competency is a broad composite statement detailing a complex, yet observable, set of behaviors that reflect basic and necessary components of knowledge, skill and attitudes.

Credential—Documented evidence of licensure, recognition, certification, education, training experience or other qualifications.

Credentialing—Providing documentation to authenticate and verify the certification and identity of an individual. In a disaster, this system ensures that personnel representing various jurisdictional levels and functional disciplines possess a minimum common level of training, currency, experience, physical and medical fitness, and capability for the incident management or emergency responder position they are tasked to fill.

Critical infrastructure—As defined in the USA Patriot Act of 2001, critical infrastructure is composed of the systems and assets, whether physical or virtual, that are so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination thereof.

Disaster—An emergency situation or occurrence whether from a terrorist incident or from a hurricane, tornado, storm, flood, tsunami, earthquake, fire, explosion, building collapse or other situation in which economic and ecological disruption and human suffering occur that cannot be alleviated without extraordinary assistance from outside the affected community or region. In a disaster, immediate response needs exceed available community or regional resources and capabilities.

Disaster epidemiology—Epidemiologic methods to measure and describe the adverse health effects of natural- and human-caused disasters and the factors that contribute to those effects; the overall objective of disaster epidemiology investigations is to assess the affected populations, match available resources to needs, prevent further adverse health effects, evaluate program effectiveness and facilitate contingency planning.

Emergency medical services (EMS)—Services, including personnel, facilities and equipment, required to ensure proper medical care for the sick and injured from the time of injury or acute illness to the time of final disposition, including medical disposition within a hospital, temporary medical facility or special care facility; release from site; or declaration of death. EMS specifically include those services immediately required to ensure proper medical care and specialized treatment for patients in a hospital and coordination of related hospital services.

EMS system—Includes the full spectrum of emergency medical care from recognition of the emergency, to telephone access of the system, to provision of prehospital care, through definitive care in the hospital. The EMS system also includes medical response to disasters, planning for and provision of medical coverage at mass gatherings, and interfacility transfers of patients.

Emergency operations center (EOC)—The physical location from which a jurisdiction or agency coordinates information and resources to support its response to major emergencies and disasters; EOCs may be organized by functional disciplines (e.g., firefighters, law enforcement, EMS), by jurisdiction (e.g., federal, state, county, city, tribal) or by a combination thereof.

Emergency responder—Local fire, law enforcement, hazardous materials (hazmat), EMS, search and rescue, public health, and medical personnel who in the early stages of an incident are responsible for protection and preservation of life, property, evidence and the environment at the incident scene.

Emergency response—Immediate actions, including execution of emergency operations plans and mitigation activities, to address the short-term, direct effects of an incident to save lives, protect property and meet basic human needs.

Health care professionals—Includes, at a minimum: hospitals, physicians (internists, surgeons, pediatricians, family and general practice physicians, and emergency medicine physicians, as well as specialists in radiation safety, infectious diseases, psychiatry and medical toxicology), dentists, nurses, veterinarians, mental health professionals, allied health personnel and EMS personnel.

Health system—Consists of state and local health departments, hospitals, health clinics, advanced life support services, EMS (including ambulances—ground and airlift), mental health facilities, dental facilities, nursing homes, blood supply facilities, laboratories, mortuaries and pharmaceutical stockpiles. A commonly overlooked component of the health

system involves the health of animals—veterinary medicine. Ultimately, this system is tied to the diagnostic and therapeutic decisions of health care professionals.

Health system preparedness—A continuous process involving the identification of threats, determination of vulnerabilities and identification of resources, as well as determination of the range of critical tasks and activities necessary to build, sustain and improve operational capability to prevent, protect against, respond to and recover from injury and disease.

Incident Command System (ICS)—A standardized organizational structure used to command, control and coordinate the use of resources and personnel responding to an emergency. The concepts and principles of ICS include common terminology, modular organization, integrated communication, unified command structure, consolidated action plan, manageable span of control, designated incident facilities and comprehensive resource management.

Injury surveillance—Public health activity that seeks to reduce morbidity and mortality by monitoring the incidence, trends, risk factors and circumstances of injuries and disseminating this information to inform decisions on the development and evaluation of injury prevention initiatives and policies.

Licensure—Affirmation by a duly constituted body, usually a state, that a person has met certain prescribed qualifications and is therefore recognized under state laws as a licensed professional.

Mass casualty incident—An emergency situation in which health care needs exceed available health care resources and capacities.

Medical surge capacity—The ability to respond to a markedly increased volume of patients, such as during a mass casualty incident, infectious disease outbreak or other complex emergency, which challenges or exceeds normal operational capacity. Surge requirements may extend beyond direct patient care to include resources and tasks such as medical transportation, laboratory testing and epidemiological investigations.

Mental health services—Diagnostic, treatment and preventive health services specially designed for the care and treatment of people with mental illness (e.g., home-based support, residential care, outpatient community services, case management, psychiatric emergency services, hospital inpatient services, rehabilitation services and intensive outreach services for individuals with severe mental illness). These services also help persons who have experienced traumatic events as well as those at increased risk of developing a mental illness.

National Incident Management System (NIMS)—A comprehensive, national all-hazards approach to incident management mandated by Homeland Security Presidential Directive-5 (HSPD-5). NIMS provides a consistent framework for improving coordination and cooperation between public and private entities in a variety of domestic incident management activities. It is applicable at all jurisdictional levels and across functional disciplines to address a spectrum of potential incidents and hazard scenarios, regardless of size or complexity. HSPD-5 required federal departments and agencies to make the adoption of NIMS by state and local organizations a condition for federal preparedness assistance by fiscal year 2005.

National Response Plan (NRP)—Last updated May 25, 2006, the NRP establishes a comprehensive all-hazards approach to enhance the ability of the United States to manage domestic incidents. The plan incorporates best practices and procedures from incident management disciplines (e.g., homeland security, emergency management, law enforcement, firefighting, search and rescue, public works, public health, health care, EMS, and the private sector) and integrates them into a unified structure. It forms the basis of how the federal government coordinates with state, local and tribal governments and the private sector during emergencies.

Privileges—Specific scope and content of patient care services authorized by a health care organization to a health care practitioner.

Privileging—Authorization granted by the health care entity for a qualified health professional to provide patient care, treatment and services with or without supervision. In an emergency situation, privileging is performed on a case-by-case basis and the responsibility for assigning privileges resides with the entity that receives volunteer responders.

Public health infrastructure—The foundation of the public health system, representing the capacity necessary to carry out specific core functions. Ideally, it is comprised of a well-trained work force; robust and integrated information and communication systems; up-to-date facilities and equipment; flexible health care surge capacity; comprehensive preparedness policies, plans and procedures; interagency and organizational coordination; and sufficient operating funds to sustain programmatic capabilities and capacities.

Public health system—Organized system of national, state and local government agencies focused on the health of populations. Specifically, the public health system aims to prevent epidemics and the spread of disease, protect against environmental hazards, prevent injury and disability, promote physical and mental health, assess and monitor health problems, inform the public and professionals about health issues, develop and enforce health-protecting laws and regulations, implement and evaluate population-based strategies to promote health and prevent disease, encourage healthy behaviors, respond to disasters and assist communities in recovery, and ensure the quality and accessibility of health services.

Syndromic surveillance—An emerging area of active public health surveillance that offers a more “real time” alerting system than traditional disease reporting (which occurs in the context of established diagnosed disease). With this system, public health agencies and emergency responders can render more aggressive, timely and clinically relevant treatment based on syndromic categories (e.g., respiratory symptoms, burns, trauma) rather than await a definitive diagnosis. Tracking the sale of medications (over-

the-counter and prescription), school absenteeism or unexplained deaths (human and animal) are examples of approaches to syndromic surveillance that are under study.

Terrorism—Acts dangerous to human life that are a violation of the criminal laws of the United States or any state and are intended to intimidate or coerce a civilian population, influence the government by intimidation or coercion, or affect the conduct of a government.

Trauma—Any injury, whether physically or emotionally inflicted. Trauma has both a medical and a psychiatric definition. Medically, trauma refers to serious or critical bodily injuries, burns, wounds or shock. This definition is often associated with trauma medicine and surgery practiced in hospitals and represents a popular view of the term. In psychiatry, trauma refers to an experience that is emotionally painful, distressful or shocking, which may result in lasting mental and physical effects.

Trauma system—Organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and is integrated with the local public health system. The true value of a trauma system is derived from the seamless transition between each phase of care, integrating existing resources to achieve improved patient outcomes. Fundamental components of the trauma care system are injury prevention, acute care facilities, and pre- and post-hospital care.

Appendix C: AMA/APHA Linkages Leadership Summit participants

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American Trauma Society

Association of State and Territorial Health Officials

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The full report and additional resources also are available on the Internet at:
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