A Consensus-based Educational Framework and Competency Set for the Discipline of Disaster Medicine and Public Health Preparedness

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ABSTRACT

Background: Various organizations and universities have developed competencies for health professionals and other emergency responders. Little effort has been devoted to the integration of these competencies across health specialties and professions. The American Medical Association Center for Public Health Preparedness and Disaster Response convened an expert working group (EWG) to review extant competencies and achieve consensus on an educational framework and competency set from which educators could devise learning objectives and curricula tailored to fit the needs of all health professionals in a disaster.

Methods: The EWG conducted a systematic review of peer-reviewed and non–peer reviewed published literature. In addition, after-action reports from Hurricane Katrina and relevant publications recommended by EWG members and other subject matter experts were reviewed for congruencies and gaps. Consensus was ensured through a 3-stage Delphi process.

Results: The EWG process developed a new educational framework for disaster medicine and public health preparedness based on consensus identification of 7 core learning domains, 19 core competencies, and 73 specific competencies targeted at 3 broad health personnel categories.

Conclusions: The competencies can be applied to a wide range of health professionals who are expected to perform at different levels (informed worker/student, practitioner, leader) according to experience, professional role, level of education, or job function. Although these competencies strongly reflect lessons learned following the health system response to Hurricane Katrina, it must be understood that preparedness is a process, and that these competencies must be reviewed continually and refined over time. (*Disaster Med Public Health Preparedness.* 2008;2:57–68)

The frequency and magnitude of disasters have increased significantly over the last 30 years, a trend that is expected to continue.[1] Factors such as overpopulation and increased urbanization,[2] climate change,[3] the spread of communicable infectious disease with increased travel and commerce,[4] and the ongoing threat of terrorism[5] magnify the susceptibility to and effects of disaster situations. Although such issues provide strong impetus to federal, state, and local governments to prioritize and improve health system preparedness and response capacities, lessons learned from recent disasters demonstrate persistent gaps in education, training, and leadership at all levels.[6–12] Recognizing the need to further enhance health system capability to respond to disasters, in October 2007 President Bush signed Homeland Security Presidential Directive-21.[13] With this directive, the president calls on the nation to promote the establishment of a discipline that recognizes the unique principles in disaster-related medicine and public health; provides a foundation for the development and dissemination of doctrine, education, training, and research in this field; and better integrates private and public disaster health systems.

The emerging discipline of disaster medicine and public health preparedness is inclusive and comprises all health care and public health professions whose expertise supports the capability of health

systems to prepare for, respond to, and recover from disasters and other public health emergencies. Those educated and trained in this discipline provide care, leadership, and community guidance in all phases of a disaster. They are also critical agents who interface with public safety and emergency management personnel, government agency officials, legislators, and policymakers, as well as help coordinate civilian and military disaster response assets. Because of the immense variation in the nature and magnitude of specific disaster events, the boundaries of the discipline are imprecise at best. As a guiding framework, the list of 37 target capabilities established by the US Department of Homeland Security provides a useful context for health system response entities.[14]

To prepare health professionals to respond appropriately, and to assist professional schools and continuing education providers to meet this challenge, various organizations and universities have developed competencies for health professionals and other emergency responders. To date, these efforts have been limited primarily to individual specialties or targeted professionals such as physicians,[15–18] nurses,[15,19] emergency medical technicians,[15] public health workers,[20–25] hospital-based health care workers,[26–29] practicing clinicians,[30] volunteer health professionals,[31–33] and students in health professions.[34–36] As yet, little effort has been devoted to the integration of these competencies across health specialties and professions that have a stake in disaster medicine and public health preparedness. This has resulted in a lack of definitional uniformity across professions with respect to education, training, and best practices, thus limiting the establishment of this discipline at an operational level. To address these gaps, the American Medical Association convened an expert panel to develop a consensus-based educational framework and competency set from which educators could devise learning objectives and curricula tailored to the needs of all health professionals.

METHODS

A systematic review was conducted to identify competencies and other educational and training guidance for professionals in the disaster health system. PubMed, Google Scholar, FirstSearch, and Excerpta Medica were searched for English-language articles published from January 2004 to July 2007 using the terms *disaster*, *public health emergency*, *mass casualty*, *training*, *education*, *course*, *competencies*, *public health*, *emergency medical services*, and *healthcare*. In addition, an Internet search using the terms *disaster*, *public health emergency*, and *mass casualty* was merged with *training*, *course*, *competencies*, *public health*, *emergency medical services*, and *healthcare* to compile published competencies outside the peer-reviewed literature. Additional citations were identified via the "related articles" link provided on the PubMed and Google Scholar sites. Information also was derived from manual review of references cited in relevant journal articles, reports, and textbooks; examination of Web sites of federal agencies and relevant stakeholder organizations; and direct communication with recognized experts in this field. The search was designed to augment a recent comprehensive literature review funded by the Agency for Healthcare Research and Quality to identify educational competencies for health care workers in disasters.[26]

Retrieved articles and reports that met the search criteria were submitted for structured review and analysis by an American Medical Association 18-person expert working group (EWG). Publications were scored (from 0 for no relevance to 3 for fully relevant) according to the extent to which they included disaster training competencies relevant to health professionals (item 1), and whether such competencies were supported by identifiable training objectives (item 2). Articles with a score of 3 on item 1 and a score of 2 or more on item 2 were chosen for further review and analysis. The EWG reviewed selected publications for relevance to all health professionals in a disaster and identified potential learning gaps.

The EWG developed competencies based on adaptation of Bloom's cognitive taxonomy.[37] In accordance with this taxonomy, a new conceptual educational framework was derived according to 6 levels of learning (knowledge, comprehension, application, analysis, synthesis, and evaluation) to enable health professionals to achieve the highest appropriate level of proficiency within each competency. The framework was created to accommodate the development of courses and curricula to meet the diverse education, training, and job requirements of all target professions.

The resultant draft educational framework and competencies were submitted to the following stakeholder organizations for review:

- American Academy of Family Physicians
- American Academy of Pediatrics
- American College of Physicians
- American College of Emergency Physicians
- American College of Surgeons
- American Hospital Association
- American Nurses Association
- American Osteopathic Association
- American Psychiatric Association
- Emergency Nurses Association
- Medical Reserve Corps
- National Association of County and City Health Officials
- National Association of Emergency Medical Services Physicians
- Uniformed Services University of the Health Sciences

After stakeholder review, the draft educational framework and competencies were revised to incorporate feedback, and then reviewed further by the National Disaster Life Support

Education Consortium (NDLSEC). The NDLSEC comprises professionals from 75 public and private organizations with an interest in disaster preparedness, professional education, and curriculum development. Consensus was ensured through a 3-stage Delphi process with the EWG (after the initial expert panel review, after the selected stakeholder review, and after the NDLSEC review). The work was funded through the Health Resources and Services Administration bioterrorism training program, which is now under the auspices of the Office of the Assistant Secretary for Preparedness and Response.

RESULTS

The literature search revealed 71 articles in the peer-reviewed literature and 20 publications without peer review (eg, after-action and government reports) published after January 2004 for initial review. After 2 levels of structured analysis, 4 peer-reviewed articles[23,24,26,34] and 4 publications not peer reviewed[27,28,31,35] were selected by the EWG for further consideration. To ensure a comprehensive and thorough review, other published clinical and public health competency sets were included for comparative assessment.[14–22,25,29,30,32,33,36] In addition, the EWG reviewed several after-action reports from hurricanes Katrina and Rita to identify potential learning gaps for health system responders that are not addressed in existing educational competency sets.[7–9,38–43]

...this educational framework will contribute to any potential basis for the credentialing or certification of volunteer health professionals, such as the Medical Reserve Corps

During the review process, 2 major issues were identified. First, existing published competencies are limited primarily to the workplace, a specific discipline, or a practice setting. They lack information needed to address a coordinated health system response to a disaster. Second, existing competency sets lack the interdisciplinary rigor that would make them relevant to all health professionals regardless of their experience and background, or prior roles in a disaster. In particular, defined competencies for health system leaders in a disaster are lacking.

Competency Design and Development

The EWG determined that existing competency sets need to be expanded to include issues such as public health law, ethics, risk communication, cultural competence, mass fatality management, forensics, contingency planning and response, the civilian–military relationship, and crisis leadership. The EWG also determined that the competencies must be comprehensive and appropriately address vulnerable individuals and populations (eg, children, pregnant women, frail older adults, people with disabilities) who may be subject to increased adverse health effects during a disaster.

Development of Competency Domains

As a first step, the EWG sought to identify and define the broad overarching competency domains relevant to all health professionals in a disaster using the literature review of existing competencies as background. After final review, 7 competency domains were identified, which encompass all of the target audiences of those responsible for a coordinated health system response. These domains are

- Preparation and Planning
- Detection and Communication
- Incident Management and Support Systems
- Safety and Security
- Clinical/Public Health Assessment and Intervention
- Contingency, Continuity, and Recovery
- Public Health Law and Ethics

Delineation of Core Competencies in Accordance With Bloom's Taxonomy

The next step was to merge the cognitive domains derived from Bloom's taxonomy with an educational model that allows health professionals to demonstrate competency according to their expected role and level of involvement in a disaster. The EWG defined 19 core competencies that are relevant to all health professionals (Table 1).

Delineation of Health Personnel Categories

The EWG identified 3 broad, yet distinct, personnel categories that encompass all health professionals: informed workers/students, practitioners, and leaders. Personnel would be expected to perform at different levels of proficiency depending on their experience, professional role, level of education, or job function across the core competencies. This framework allows for all of the health professions to be represented in each category, and recognizes the diversity of expected job functions and educational requirements for each health profession involved in disaster planning and response.

The health personnel categories establish increasing standards for each core competency. Health professionals can demonstrate proficiency in each category at the following levels based on their educational needs, experience, professional role, and job function in disaster planning, mitigation, response, and recovery:

- *Informed Worker/Student:* These are health professionals and students who require awareness and understanding of particular aspects of disaster planning, mitigation, response, or recovery. These people should be able to describe core concepts or skills but may have limited ability or need to apply this knowledge.

TABLE 1

Core Competencies for All Health Professionals in a Disaster

Competency Domain	Core Competencies
1.0 Preparation and Planning	1.1 Demonstrate proficiency in the use of an all-hazards framework for disaster planning and mitigation. 1.2 Demonstrate proficiency in addressing the health-related needs, values, and perspectives of all ages and populations in regional, community, and institutional disaster plans.
2.0 Detection and Communication	2.1 Demonstrate proficiency in the detection of and immediate response to a disaster or public health emergency. 2.2 Demonstrate proficiency in the use of information and communication systems in a disaster or public health emergency. 2.3 Demonstrate proficiency in addressing cultural, ethnic, religious, linguistic, socioeconomic, and special health-related needs of all ages and populations in regional, community, and institutional emergency communication systems.
3.0 Incident Management and Support Systems	3.1 Demonstrate proficiency in the initiation, deployment, and coordination of national, regional, state, local, and institutional incident command and emergency operations systems. 3.2 Demonstrate proficiency in the mobilization and coordination of disaster support services. 3.3 Demonstrate proficiency in the provision of health system surge capacity for the management of mass casualties in a disaster or public health emergency.
4.0 Safety and Security	4.1 Demonstrate proficiency in the prevention and mitigation of health, safety, and security risks to yourself and others in a disaster or public health emergency. 4.2 Demonstrate proficiency in the selection and use of personal protective equipment at a disaster scene or receiving facility. 4.3 Demonstrate proficiency in victim decontamination at a disaster scene or receiving facility.
5.0 Clinical/Public Health Assessment and Intervention	5.1 Demonstrate proficiency in the use of triage systems in a disaster or public health emergency. 5.2 Demonstrate proficiency in the clinical assessment and management of injuries, illnesses, and mental health conditions manifested by all ages and populations in a disaster or public health emergency. 5.3 Demonstrate proficiency in the management of mass fatalities in a disaster or public health emergency. 5.4 Demonstrate proficiency in public health interventions to protect the health of all ages, populations, and communities affected by a disaster or public health emergency.
6.0 Contingency, Continuity, and Recovery	6.1 Demonstrate proficiency in the application of contingency interventions for all ages, populations, institutions, and communities affected by a disaster or public health emergency. 6.2 Demonstrate proficiency in the application of recovery solutions for all ages, populations, institutions, and communities affected by a disaster or public health emergency.
7.0 Public Health Law and Ethics	7.1 Demonstrate proficiency in the application of moral and ethical principles and policies for ensuring access to and availability of health services for all ages, populations, and communities affected by a disaster or public health emergency. 7.2 Demonstrate proficiency in the application of laws and regulations to protect the health and safety of all ages, populations, and communities affected by a disaster or public health emergency.

- *Practitioner:* These are health professionals who are required to apply clinical or public health knowledge, skills, and values in disaster planning, mitigation, response, and recovery. Within this category, distinct educational tracks could be defined and developed to meet recommended or required proficiency standards (eg, basic, intermediate, advanced).
- *Leader:* These are senior executives (CEO, COO, CFO), directors, managers, and department heads with administrative decision-making responsibilities, leadership functions, and policymaking roles in disaster planning, mitigation, response, or recovery. Within this category, distinct educational tracks could be defined and developed to meet various leadership roles and functions in a disaster (eg, incident command leaders, health executives, government leaders).

Delineation of Category-specific Competencies in Accordance With Bloom's Taxonomy

The EWG defined specific competencies within each core competency that describe the highest level of proficiency appropriate for each personnel category (Table 2).

Proposed Learning Matrix for All Health System Responders

The EWG recognized that health professionals vary in their expected roles and level of involvement in a disaster. Therefore, it developed a learning matrix that can be customized for any target audience to define proficiency requirements within each competency (Table 3). With this matrix, disaster health education and training programs can be created or modified to incorporate the competencies at the desired proficiency levels.

TABLE 2

Proposed Core and Group-specific Competencies for Health Professionals in a Disaster

Competency Domains	Core Competencies	Category-specific Competencies		
		Informed Worker/Student	Practitioner	Leader
1.0 Preparation and Planning	1.1 Demonstrate proficiency in the use of an all-hazards framework for disaster planning and mitigation.	1.1.1 Describe the all-hazards framework for disaster planning and mitigation. 1.1.2 Explain key components of regional, community, institutional, and personal/family disaster plans.	1.1.3 Summarize your regional, community, office, institutional, and personal/family disaster plans. 1.1.4 Explain the purpose of disaster exercises and drills in regional, community, and institutional disaster preparation and planning. 1.1.5 Conduct hazard vulnerability assessments for your office practice, community, or institution.	1.1.6 Participate in the design, implementation, and evaluation of regional, community, and institutional disaster plans.
	1.2 Demonstrate proficiency in addressing the health-related needs, values, and perspectives of all ages and populations in regional, community, and institutional disaster plans.	1.2.1 Identify individuals (of all ages) and populations with special needs who may be more vulnerable to adverse health effects in a disaster.	1.2.2 Delineate health care and public health issues that need to be addressed in regional, community, and institutional disaster plans to accommodate the needs, values, and perspectives of all ages and populations. 1.2.3 Identify psychological reactions that may be exhibited by victims of all ages, their families, and responders in a disaster or public health emergency.	1.2.4 Create, evaluate, and revise policies and procedures for meeting the health-related needs of all ages and populations in regional, community, and institutional disaster plans.
2.0 Detection and Communication	2.1 Demonstrate proficiency in the detection of and immediate response to a disaster or public health emergency.	2.1.1 Recognize general indicators and epidemiological clues of a disaster or public health emergency (including natural, unintentional, and terrorist events). 2.1.2 Describe immediate actions and precautions to protect yourself and others from harm in a disaster or public health emergency.	2.1.3 Characterize signs and symptoms, as well as disease and injury patterns, likely to be associated with exposure to natural disasters or to conventional and nuclear explosives and/or release of biological, chemical, and radiological agents. 2.1.4 Explain the purpose and role of surveillance systems that can be used to detect and monitor a disaster or public health emergency.	2.1.5 Evaluate and modify policies and procedures for the detection and immediate response to natural disasters, industrial- or transportation-related catastrophes (eg, hazardous material spill, explosion), epidemics, and acts of terrorism (eg, involving conventional and nuclear explosives and/or release of biological, chemical, and radiological agents).
	2.2 Demonstrate proficiency in the use of information and communication systems in a disaster or public health emergency.	2.2.1 Describe emergency communication and reporting systems and procedures for contacting family members, relatives, coworkers, and local authorities in a disaster or public health emergency. 2.2.2 Describe informational resources that are available for health professionals and the public to prepare for, respond to, and recover from disasters.	2.2.3 Use emergency communications systems to report critical health information to appropriate authorities in a disaster or public health emergency. 2.2.4 Access timely and credible health and safety information for all ages and populations affected by natural disasters, industrial- or transportation-related catastrophes (eg, hazardous material spill, explosion), epidemics, and acts of terrorism (eg, involving conventional and nuclear explosives and/or release of biological, chemical, and radiological agents).	2.2.5 Evaluate and modify risk communication and emergency reporting systems to ensure that health, safety, and security warnings, as well as actions taken, are articulated clearly and appropriately in a disaster or public health emergency.
	2.3 Demonstrate proficiency in addressing cultural, ethnic, religious, linguistic, socioeconomic, and special health-related needs of all ages and populations in regional, community, and institutional emergency communication systems.	2.3.1 Describe strategies for and barriers to communicating and disseminating health information to all ages and populations affected by a disaster or public health emergency.	2.3.2 Delineate cultural, ethnic, religious, linguistic, and health-related issues that need to be addressed in regional, community, and institutional emergency communication systems for all ages and populations affected by a disaster or public health emergency.	2.3.3 Create, evaluate, and revise policies and procedures for meeting the needs of all ages and populations in regional, community, and institutional emergency communication systems.

(Continued)

TABLE 2

Proposed Core and Group-specific Competencies for Health Professionals in a Disaster

Competency Domains	Core Competencies	Category-specific Competencies		
		Informed Worker/Student	Practitioner	Leader
3.0 Incident Management and Support Systems	3.1 Demonstrate proficiency in the initiation, deployment, and coordination of national, regional, state, local, and institutional incident command and emergency operations systems.	3.1.1 Describe the purpose and relevance of the National Response Plan, National Incident Management System, and Hospital Incident Command System to regional, community, and institutional disaster response.	3.1.2 Delineate your function and describe other job functions in institutional, community, and regional disaster response systems to ensure unified command and scalable response to a disaster or public health emergency. 3.1.3 Perform your expected role in a disaster (eg, through participation in exercises and drills) within the incident or emergency management system established by the community, organization, or institution.	3.1.4 Devise, evaluate, and modify institutional, community, and regional incident command, emergency operations, and emergency response systems (eg, based on after-action reports from actual events, disaster exercises, and drills) to ensure unified command and scalable response to a disaster or public health emergency.
	3.2 Demonstrate proficiency in the mobilization and coordination of disaster support services.	3.2.1 Describe global, federal, regional, state, local, institutional, organizational, and private industry disaster support services, including the rationale for the integration and coordination of these systems.	3.2.2 Demonstrate the ability to collaborate with relevant public and private sector stakeholders to ensure efficient coordination of civilian, military, and other disaster response assets.	3.2.3 Develop, evaluate, and revise policies and procedures for mobilizing and integrating global, federal, regional, state, local, institutional, organizational, and private industry disaster support services. This includes knowledge of legal statutes and mutual aid agreements for the mobilization and deployment of civilian, military, and other response personnel and assets.
	3.3 Demonstrate proficiency in the provision of health system surge capacity for the management of mass casualties in a disaster or public health emergency.	3.3.1 Describe the potential impact of mass casualties on access to and availability of clinical and public health resources in a disaster.	3.3.2 Characterize institutional, community, and regional surge capacity assets in the public and private health response sectors, and the extent of their potential assistance in a disaster or public health emergency.	3.3.3 Develop and evaluate policies, plans, and strategies for predicting and providing surge capacity of institutional, community, and regional health systems for the management of mass casualties in a disaster or public health emergency.
4.0 Safety and Security	4.1 Demonstrate proficiency in the prevention and mitigation of health, safety, and security risks to yourself and others in a disaster.	4.1.1 Using an all-hazards framework, explain general health, safety, and security risks associated with disasters. 4.1.2 Describe infection control precautions to protect health care workers, other responders, and the public from exposure to communicable diseases, such as pandemic influenza.	4.1.2 Characterize unique health, safety, and security risks associated with natural disasters, industrial- or transportation-related catastrophes (eg, hazardous material spill, explosion), epidemics, and acts of terrorism (eg, involving conventional and nuclear explosives and/or release of biological, chemical, and radiological agents). 4.1.3 Use federal and institutional guidelines and protocols to prevent the transmission of infectious agents in health care and community settings.	4.1.3 Develop, evaluate, and revise community, institutional, and regional policies and procedures to protect the health, safety, and security of all ages and populations affected by a disaster or public health emergency.
	4.2 Demonstrate proficiency in the selection and use of personal protective equipment at a disaster scene or receiving facility.	4.2.1 Describe the rationale, function, and limitations of personal protective equipment that may be used in a disaster or public health emergency.	4.2.2 Demonstrate the ability to select, locate, don, and work in personal protective equipment according to the degree and type of protection required for various types of exposures.	4.2.3 Develop, evaluate, and revise policies, protocols, and procedures for the use of all levels of personal protective equipment that may be used at a disaster scene or receiving facility.

TABLE 2

Proposed Core and Group-specific Competencies for Health Professionals in a Disaster

Competency Domains	Core Competencies	Category-specific Competencies		
		Informed Worker/Student	Practitioner	Leader
	4.3 Demonstrate proficiency in victim decontamination at a disaster scene or receiving facility.	4.3.1 Explain the purpose of victim decontamination in a disaster.	4.3.2 Decontaminate victims at a disaster scene or receiving facility.	4.3.3 Develop, evaluate, and revise decontamination policies, protocols, and procedures that may be implemented at a disaster scene or receiving facility.
5.0 Clinical/Public Health Assessment and Intervention	5.1 Demonstrate proficiency in the use of triage systems in a disaster or public health emergency.	5.1.1 Explain the role of triage as a basis for prioritizing or rationing health care services for victims and communities affected by a disaster or public health emergency.	5.1.2 Explain the strengths and limitations of various triage systems that have been developed for the management of mass casualties at a disaster scene or receiving facility. 5.1.3 Perform mass casualty triage at a disaster scene or receiving facility.	5.1.5 Develop, evaluate, and revise mass casualty and population-based triage policies, protocols, and procedures that may be implemented in a disaster or public health emergency.
	5.2 Demonstrate proficiency in the clinical assessment and management of injuries, illnesses, and mental health conditions manifested by all ages and populations in a disaster or public health emergency.	5.2.1 Describe possible medical and mental health consequences for all ages and populations affected by a disaster or public health emergency. 5.2.2 Explain basic life saving and support principles and procedures that can be used at a disaster scene.	5.2.3 Demonstrate the ability to apply and adapt clinical knowledge and skills for the assessment and management of injuries and illnesses in victims of all ages under various exposure scenarios (eg, natural disasters; industrial- or transportation-related catastrophes; epidemics; and acts of terrorism involving conventional and nuclear explosives and/or release of biological, chemical, and radiological agents), in accordance with professional scope of practice. 5.2.4 Identify strategies to manage fear, panic, stress, and other psychological responses that may be displayed by victims, families, and responders in a disaster or public health emergency.	5.2.5 Develop, evaluate, and revise policies, protocols, and procedures for the clinical care of all ages and populations under crisis conditions, with limited situational awareness and resources.
	5.3 Demonstrate proficiency in the management of mass fatalities in a disaster or public health emergency.	5.3.1 Describe psychological, emotional, cultural, religious, and forensic considerations for the management of mass fatalities in a disaster or public health emergency.	5.3.2 Explain the implications and specialized support services required for the management of mass fatalities from natural disasters, epidemics, and acts of terrorism (eg, involving conventional and nuclear explosives and/or release of biological, chemical, and radiological agents). 5.3.3 Explain the significance of (and the need to collect and preserve) forensic evidence from living and deceased humans and animals at a disaster scene or receiving facility.	5.3.4 Develop, evaluate, and revise policies, protocols, and procedures for the management of human and animal remains at a disaster scene or receiving facility.
	5.4 Demonstrate proficiency in public health interventions to protect the health of all ages, populations, and communities affected by a disaster or public health emergency.	5.4.1 Describe short- and long-term public health interventions appropriate for all ages, populations, and communities affected by a disaster or public health emergency.	5.4.2 Apply knowledge and skills for the public health management of all ages, populations, and communities affected by natural disasters, industrial- or transportation-related catastrophes, epidemics, and acts of terrorism, in accordance with professional scope of practice. This includes active/passive surveillance, movement restriction, vector control, mass immunization and prophylaxis, rapid needs assessment, environmental monitoring, safety of food and water, and sanitation.	5.4.3 Develop, evaluate, and revise public health policies, protocols, and procedures for the management of all ages, populations, and communities affected by natural disasters, industrial- or transportation-related catastrophes, epidemics, and acts of terrorism.

(*Continued*)

TABLE 2

Proposed Core and Group-specific Competencies for Health Professionals in a Disaster

Competency Domains	Core Competencies	Category-specific Competencies		
		Informed Worker/Student	Practitioner	Leader
6.0 Contingency, Continuity, and Recovery	6.1 Demonstrate proficiency in the application of contingency interventions for all ages, populations, institutions, and communities affected by a disaster or public health emergency.	6.1.1 Describe solutions for ensuring the continuity of supplies and services to meet the medical and mental health needs of yourself, your family, office practice, institution, and community in a disaster, in various contingency situations (eg, mass evacuation, mass sheltering, prolonged shelter in place).	6.1.2 Demonstrate creative and flexible decision making in various contingency situations and risk scenarios, under crisis conditions and with limited situational awareness. 6.1.3 Describe community and institutional protocols and procedures for the evacuation and transport of individuals and populations (of all ages) affected by a disaster or public health emergency.	6.1.4 Develop, evaluate, and revise contingency and continuity policies and plans for health care professionals, institutions, and community health systems to maintain the highest possible standards of care under various risk scenarios.
	6.2 Demonstrate proficiency in the application of recovery solutions for all ages, populations, institutions, and communities affected by a disaster or public health emergency.	6.2.1 Describe short- and long-term medical and mental health considerations for the recovery of all ages, populations, and communities affected by a disaster or public health emergency.	6.2.2 Describe solutions for ensuring the recovery of clinical records, supplies, and services to meet the physical and mental health needs of yourself, your family, institution, and community in a disaster or public health emergency. 6.2.3 Explain mechanisms for providing postevent feedback and lessons learned to appropriate authorities (eg, through after-action reports) to improve regional, community, and institutional disaster response systems.	6.2.4 Develop, evaluate, and revise policies, plans, and procedures for the continuous evaluation of regional, community, and institutional disaster response and recovery efforts, and implement necessary actions to enhance health system preparedness, response, and recovery for future events.
7.0 Public Health Law and Ethics	7.1 Demonstrate proficiency in the application of moral and ethical principles and policies for ensuring access to and availability of health services for all ages, populations, and communities affected by a disaster or public health emergency.	7.1.1 Describe moral and ethical issues relevant to the management of individuals of all ages, populations, and communities affected by a disaster or public health emergency.	7.1.2 Apply moral and ethical principles and policies to address individual and community health needs in a disaster. This includes understanding of professional obligation to treat, the right to protect personal safety in a disaster, and responsibilities and rights of health professionals in a disaster or public health emergency.	7.1.3 Develop, evaluate, and revise ethical principles, policies, and codes to address individual and community health needs in all phases of a disaster.
	7.2 Demonstrate proficiency in the application of laws and regulations to protect the health and safety of all ages, populations, and communities affected by a disaster or public health emergency.	7.2.1 Describe legal and regulatory issues relevant to disasters and public health emergencies, including the basic legal framework for public health.	7.2.2 Apply legal principles, policies, and practices to address individual and community health needs in a disaster. This includes understanding of liability, worker protection and compensation, licensure, privacy, quarantine laws, and other legal issues to enable and encourage health professionals to participate in disaster response and maintain the highest possible standards of care under extreme conditions.	7.2.3 Develop, evaluate, and revise legal principles, policies, practices, and codes to address individual and community health needs in all phases of a disaster.

TABLE 3

Example Learning Matrix: Hospital Administrator*

Core Competencies	Expected Level of Proficiency		
	Informed Worker/ Student	Practitioner	Leader
1.1 Demonstrate proficiency in the use of an all-hazards framework for disaster planning and mitigation.			X
1.2 Demonstrate proficiency in addressing the health-related needs, values, and perspectives of all ages and populations in regional, community, and institutional disaster plans.			X
2.1 Demonstrate proficiency in the detection of and immediate response to a disaster or public health emergency.			X
2.2 Demonstrate proficiency in the use of information and communication systems in a disaster or public health emergency.			X
2.3 Demonstrate proficiency in addressing cultural, ethnic, religious, linguistic, socioeconomic, and special health-related needs of all ages and populations in regional, community, and institutional emergency communication systems.		X	
3.1 Demonstrate proficiency in the initiation, deployment, and coordination of national, regional, state, local, and institutional incident command and emergency operations systems.			X
3.2 Demonstrate proficiency in the mobilization and coordination of disaster support services.			X
3.3 Demonstrate proficiency in the provision of health system surge capacity for the management of mass casualties in a disaster or public health emergency.			X
4.1 Demonstrate proficiency in the prevention and mitigation of health, safety, and security risks to yourself and others in a disaster or public health emergency.			X
4.2 Demonstrate proficiency in the selection and use of personal protective equipment at a disaster scene or receiving facility.	X		
4.3 Demonstrate proficiency in victim decontamination at a disaster scene or receiving facility.	X		
5.1 Demonstrate proficiency in the use of triage systems in a disaster or public health emergency.	X		
5.2 Demonstrate proficiency in the assessment and management of injuries, illnesses, and mental health conditions manifested by all ages and populations in a disaster or public health emergency.	X		
5.3 Demonstrate proficiency in the management of mass fatalities in a disaster or public health emergency.			X
5.4 Demonstrate proficiency in public health interventions to protect the health of all ages, populations, and communities affected by a disaster or public health emergency.	X		
6.1 Demonstrate proficiency in the application of contingency interventions for all ages, populations, institutions, and communities affected by a disaster or public health emergency.			X
6.2 Demonstrate proficiency in the application of recovery solutions for all ages, populations, institutions, and communities affected by a disaster or public health emergency.			X
7.1 Demonstrate proficiency in the application of moral and ethical principles and policies for ensuring access to and availability of health services for all ages, populations, and communities affected by a disaster or public health emergency.		X	
7.2 Demonstrate proficiency in the application of laws and regulations to protect the health and safety of all ages, populations, and communities affected by a disaster or public health emergency.		X	

*This example is intended solely to demonstrate how the proposed competency framework could be applied to a particular target group. It should not be interpreted as defining expected competencies for hospital administrators.

DISCUSSION

The EWG process developed a new educational framework for disaster medicine and public health preparedness based on consensus identification of core learning domains and cross-competencies. The competencies can be applied to a wide range of health professionals who are expected to perform at different levels according to experience, professional role, level of education, or job function. This approach will lead to a common lexicon and improved standardization of training programs. Within this framework, health professionals will be

better able to identify limits to their knowledge, skills, and authority in a disaster, as well as identify key system resources for referring problems or matters that exceed these limits.

This educational framework strongly supports the recommendations of Homeland Security Presidential Directive-21, and permits application within this rubric. This model allows for the identification and incorporation of the unique body of knowledge of disaster medicine and public health preparedness and provides for the broad dissemination of this knowledge base to various target professions. It also provides a practical and flexible framework for the education, training, and evaluation of all health professionals according to their expected role and level of involvement in a disaster. The framework defines consensus-based floor (informed worker/student) and ceiling (leader) levels of proficiency for all health professionals in disaster medicine and public health preparedness. It allows for the accumulation of knowledge and proficiency in any competency and personnel category, and progression between categories, as well. This correlates with the progression of applications in tactics, operations, and strategy.

Within personnel categories, distinct educational tracks can be further defined and developed to meet more specialized learning objectives, training requirements, and job needs. Within the practitioner category, for example, distinct learning tracks could be developed to meet specified job expectations in a disaster (eg, to meet basic, intermediate, or advanced levels of proficiency). In the leader category, separate tracks could be developed for incident command leaders, health executives, and government leaders to meet their various leadership roles and functions in a disaster. Although it is recommended that the core competencies for the informed worker/student be achieved by all potential health system responders before achieving the practitioner or leader proficiency levels, this decision will ultimately rest with credentialing and certification entities, as well as curriculum developers.

In accordance with the Pandemic and All-Hazards Preparedness Act,[44] this educational framework will contribute to any potential basis for the credentialing or certification of volunteer health professionals, such as the Medical Reserve Corps. Conceptually, potential health system volunteers would be preregistered with documentation of their current proficiency status in disaster medicine and public health preparedness. This could promote the further evolution of the Emergency Services Advanced Registry for Volunteer Health Professionals and similar databases to facilitate the mobilization and deployment of well-prepared and well-trained health professionals for all disasters.

Next Steps

An important next step is the development of learning objectives and performance metrics for each category-specific competency. Presently, the educational framework and competencies are being vetted with the NDLSEC for incorporation into the National Disaster Life Support training program. Learning objectives and evaluation tools also are being developed through the NDLSEC for integration into future iterations of the National Disaster Life Support courses.

The educational framework and competencies still require validation, which will be accomplished by NDLSEC members and through incorporation into the National Disaster Life Support program. Although these competencies strongly reflect lessons learned following the health system response to Hurricane Katrina and can enhance preparedness for future disasters, preparedness is a process rather than an endpoint, and these competencies must be reviewed continually and refined over time.

> ...existing published competencies are limited primarily to the workplace, a specific discipline, or a practice setting. They lack information needed to address a coordinated health system response to a disaster.

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