Bioterrorism and Other Public Health Emergencies
Tools and Models for Planning and Preparedness

Mass Medical Care with Scarce Resources

A Community Planning Guide

Prepared for:
Agency for Healthcare Research and Quality
540 Gaither Road, Rockville, MD 20850

Contract No. 290-04-0010

Prepared by:
Health Systems Research, Inc.
An Altarum company

Editors

Sally J. Phillips, R.N., Ph.D.
Public Health Emergency Preparedness Research Program
Agency for Healthcare Research and Quality

Ann Knebel, R.N., D.N.Sc., FAAN
Office of Preparedness and Emergency Operations
Office of the Assistant Secretary for Preparedness and Response

Lead Authors

Marc Roberts, Ph.D., Harvard University
James G. Hodge, Jr., J.D., LL.M., Georgetown and Johns Hopkins Universities
Edward Gabriel, M.P.A., AEMT-P, Walt Disney Corporation
John L. Hick, M.D., Hennepin County Medical Center
Stephen Cantrill, M.D., Denver Health Medical Center
Anne M. Wilkinson, Ph.D., M.S., RAND Corporation
Marianne Matzo, Ph.D., APRN, BC, FAAN, University of Oklahoma College of Nursing

February 2007
AHRQ Publication No. 07-0001

Funding to support *Mass Medical Care with Scarce Resources: A Community Planning Guide* was provided by the U.S. Department of Health and Human Services' Office of the Assistant Secretary for Preparedness and Response (formerly Office of Public Health Emergency Preparedness through an Agency for Healthcare Research and Quality contract to Health Systems Research, Inc., an Altarum company (Contract No. 290-04-0010).

The authors of this report are responsible for its content. No statement in the report should be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

Suggested Citation

Phillips SJ, Knebel A, eds. *Mass Medical Care with Scarce Resources: A Community Planning Guide*. Prepared by Health Systems Research, Inc., an Altarum company, under contract No. 290-04-0010. AHRQ Publication No. 07-0001. Rockville, MD: Agency for Healthcare Research and Quality 2007.

About This Guide

Purpose of the Guide

The purpose of this guide is to provide community planners – as well as planners at the facility/community, State, and Federal levels – with valuable information and insights that will help them in their efforts to plan for and respond to a mass casualty event (MCE). This guide provides information on:

- The circumstances that communities likely would face as a result of an MCE.
- Key constructs, principles, and structures to be incorporated into the planning for an MCE.
- Approaches and strategies that could be used to provide the most appropriate standards of care possible under the circumstances.
- Examples of tools and resources available to help States and communities in their planning process.
- Illustrative examples of how certain health systems, communities, or States have approached certain issues as part of their MCE-related planning efforts.

This information will be useful in helping planners address the issues associated with preparing for and responding to an MCE in the context of broader emergency planning processes, such as those laid out in *Standing Together: An Emergency Planning Guide for America's Communities,* published by the Joint Commission on the Accreditation of Healthcare Organizations, 2005.

This document is intended not to reflect Department of Health and Human Services policy but to provide State and local planners with options to consider when planning their response to an MCE.

Development of the Guide

This guide builds and expands on an earlier document published by the Agency for Healthcare Research and Quality (AHRQ) that explored the issues and outlined the principles associated with the provision of medical care in the face of overwhelming numbers of casualties. It is the product of collaboration between the Office of the Assistant Secretary for Preparedness and Response (formerly the Office of Public Health Emergency Preparedness) and AHRQ, who coedited the guide. Leading experts were identified and a series of papers was commissioned to address issues pertaining to six critical fields related to mass casualty care. Working individually or as parts of writing teams, the experts prepared drafts of their papers, which were presented for discussion among a broader group of experts at a meeting held in Washington, DC, on June 1–2, 2006. The writers incorporated much of the discussion and input from that meeting into their respective chapters. The list of meeting participants, including lead authors and the members of the writing teams, is presented in Appendix A.

Acknowledgements

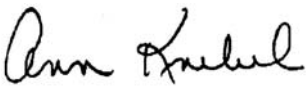
This planning guide is the product of a collaborative effort and as such reflects the extensive contributions of many knowledgeable individuals who shared their time, insights, experiences, and expertise. Their backgrounds and perspectives range from field experience in providing mass medical care with scarce resources to planning for such eventualities and all the related challenges.

We particularly would like to thank our expert teams who crafted critical content in specific areas. In the area of **prehospital care**, our thanks go to Edward Gabriel, M.P.A., AEMT-P (Writing Team Lead); Peter Pons, M.D.; George Foltin, M.D.; Richard Serino, EMT-P; and Paul Maniscalco, M.P.A., EMT-P. The writing team that addressed **hospital and acute care** issues was comprised of John L. Hick, M.D. (Writing Team Lead); Lewis Rubinson, M.D., Ph.D.; Daniel O'Laughlin, M.D.; Gabor Kelen, M.D.; Richard Waldhorn, M.D.; and Dennis P. Whalen. The issues of **alternative care sites** were addressed by Stephen Cantrill, M.D. (Writing Team Lead); Dan Hanfling, M.D., FACEP; Peter Pons, M.D.; and Carl Bonnett, M.D. An overview of the issues and challenges of providing **palliative care** was provided by Anne M. Wilkinson, M.S., Ph.D. (Writing Team Colead); Marianne Matzo, Ph.D., APRN, BC, FAAN (Writing Team Colead); Maria Gatto, M.A., APRN; and Joanne Lynn, M.D., M.A., M.S. In addition, we would like to acknowledge the expert writings on **ethical considerations** provided by Marc Roberts, Ph.D., and Evan G. DeRenzo, Ph.D., and on the **legal environment** provided by James G. Hodge, Jr., J.D., LL.M.

This planning guide was prepared under contract with **Health Systems Research, Inc. (HSR),** an Altarum company. HSR staff members' contributions ranged from organizing and managing the input of all the expert teams and the planning, logistics, and facilitation of the expert meeting to the overall planning guide concept, design, and production. We would like to thank the HSR writing, editing, and production staff who were so instrumental in shaping this planning guide and ensuring that the final product would be of the greatest use for community planners in all settings: Lawrence Bartlett, Ph.D.; Valerie Gwinner, M.P.P., M.A.; Laurene Graig, M.A.; Dennis Zaenger, M.P.H.; Holly Doggett; Isha Fleming; Stephen Gilberg; Maureen Ball; Cheryl Bell; Katherine Flore, M.P.H.; and Laura Sternesky, M.P.A.

We sincerely hope that this community guide will serve as a practical tool for community planners across the United States as they consider the challenge of providing mass medical care with scarce resources.

Sally Phillips, R.N., Ph.D.
Director, Public Health Emergency Preparedness
Research Program
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services



Ann Knebel, R.N., D.N.Sc., FAAN
Captain, U.S. Public Health Service
Deputy Director for Preparedness Planning
Office of Assistant Secretary for Preparedness and Response
U.S. Department of Health and Human Services

Contents

Executive Summary

Background

In the event of a catastrophic public health- or terrorism-related event, such as an influenza pandemic or the detonation of improvised nuclear devices, the resulting tens of thousands of victims will be likely to overwhelm the resources of a community's health care system. In this dire scenario, which we refer to as a mass casualty event (MCE), it will be necessary to *allocate scarce resources in a manner that is different from usual circumstances but appropriate to the situation.* Making optimal decisions concerning the allocation of scarce resources could make a big difference in the degree to which health care systems continue to function; ultimately it could mean saving many thousands of lives.

Purpose of the Guide

The purpose of this guide is to provide community planners – as well as planners at the facility/community, State, and Federal levels – with valuable insights and information that will help them in their efforts to plan for and respond to an MCE. The guide aims to present planners with approaches and strategies that would enable them to provide the most appropriate standards of care possible under the circumstances of an MCE.

This document is intended not to reflect Department of Health and Human Services policy but to provide State and local planners with options to consider when planning their response to an MCE.

Development of the Guide

This guide builds and expands on an earlier document published by the Agency for Healthcare Research and Quality (AHRQ). *Altered Standards of Care in Mass Casualty Events* (available on the AHRQ Web site at **http://www.ahrq.gov/research/altstand**/) explored the issues and outlined the principles associated with the provision of medical care in the face of overwhelming numbers of casualties.

This planning guide is the product of a collaborative effort between AHRQ and the Office of the Assistant Secretary for Preparedness and Response (formerly the Office of Public Health Emergency Preparedness).

Organization of the Guide

This planning guide looks at issues and challenges in MCE response and preparedness issues across the spectrum of health care settings and provides recommendations for planners specific to each area. The planning guide begins with a discussion of the ethical and legal considerations and then discusses issues related to MCE planning in three care settings: prehospital, hospital and acute care, and alternative care sites (ACSs). This is followed by a discussion of palliative

care issues, which must be integrated throughout the planning for and response to an MCE. The planning guide concludes with a presentation of a case study: an influenza pandemic.

Ethical Considerations

We live in a world where a whole range of manmade and natural disasters are of increasing concern to communities across the Nation. Terrorism, epidemics, hurricanes, earthquakes, floods, and fires are all too possible in an industrialized and increasingly interdependent world. For this reason, serious and systematic disaster planning and preparedness at the community level are absolutely essential. If or when a disaster occurs, communities must be prepared for the possibility that the arrival of government assistance may be delayed. Indeed, potentially significant interruptions in the deployment of medical assistance may occur in certain kinds of events (e.g., pandemic influenza) or in situations in which several events occur simultaneously. Government agencies at all levels may be overstretched by multiple challenges and competing demands or have their ability to function degraded by catastrophic events.

Hurricane Katrina, for example, demonstrated that communications systems may be damaged or temporarily severed at the outset of a disaster. While such systems are being reestablished or put in place, local communities that have planned for such a possibility will have a head start on meeting community care needs.

Indeed, one reality is clear: communities that have not planned and prepared for such an eventuality will be less equipped to face the complexities of such an event than communities that have planned. Moreover, once a planning process is undertaken, it will become clear that serious ethical decisions are central to shaping any community's disaster response. It is important to realize that once a disaster strikes, difficult choices will have to be made, and the more fully the ethical issues raised by such choices are discussed prior to making them, the greater the potential for the choices to be ethically sound. The ethical issues and considerations in MCE planning are discussed in Chapter II.

Legal Issues

Laws at all levels of government are a critical part of emergency responses and allocation decisions involving scarce resources in an MCE. Legal issues that need to be considered in the context of MCE planning include understanding the changing legal landscape during emergencies, the balance of individual and communal interests, the suspension of existing legal requirements, interjurisdictional legal coordination issues, medical licensure reciprocity, liability and other protections for health care workers and volunteers, property management and control, and legal triage.

Chapter III contains a detailed discussion of relevant laws and their potential impact on the ability of planners to allocate scarce resources during an MCE.

Prehospital Care

In the event of an MCE, the emergency medical services (EMS) systems will be called on to provide first-responder rescue, assessment, care, and transportation and access to the emergency medical health care system. The bulk of EMS in this country is provided through a complex system of highly variable organizational structures. While efforts are ongoing to standardize EMS disaster training, no single oversight agency is responsible for ensuring consistency in training, certification, or guidelines for disaster response; the use of personal protective equipment; or the coordination of EMS response and operations.

The unique context in which EMS systems operate in this country serves to amplify the challenges of providing emergency medical services in the context of an MCE. The issues and challenges of providing such services are discussed in Chapter IV.

Hospital and Acute Care

The overall goal of hospital and acute care response to an MCE is to maximize care across the greatest number of people while meeting at least minimal obligations for care to all who are in need. In the case of an MCE, however, hospitals will not have access to many needed resources. Thus, some of the most difficult decisions about providing an appropriate standard of medical care in an environment of scarce resources will be made in hospitals.

The major challenges that hospitals will face in an MCE include surge capacity issues, the fact that they are already at or near capacity for emergency and trauma services, a lack of on-call specialists and nurses, the need to coordinate between competing health care systems, incompatibilities in communications systems, and the need for security and protection, to name just a few. The issues related to MCE planning and response in the hospital sector are discussed in detail in Chapter V.

ACSs

The impact of an MCE of any significant magnitude likely will overwhelm hospitals and other traditional venues for health care services. Indeed, it may render them inoperable, necessitating the establishment of ACSs for the provision of care that normally would be provided in an inpatient facility. Advance planning is critical to the establishment and operation of ACSs; this planning must be coordinated with existing health care facilities as well as home care entities. Planners must delineate the specific medical functions and treatment objectives of the ACS. The principle of managing patients under relatively austere conditions, with only limited supplies, equipment, and access to pharmaceuticals and a minimal staffing arrangement, is the starting point for ACS planning.

The issues and challenges of establishing and operating ACSs during an MCE, as well as specific case study examples of ACSs in operation during the response to Hurricane Katrina, are discussed in detail in Chapter VI.

Palliative Care

In the event of an MCE, it will be assumed that some people may survive the onset of the disaster but will have sustained such serious illness or injury that they will live only for a relatively short period of time. In addition, there will be vulnerable individuals (e.g., the elderly, those sick in hospitals, nursing homes, the disabled, children) who may be negatively impacted by the resulting scarcity of resources. In some instances, decisions will need to be made to withdraw resources from those not likely to survive and shunt those resources to others.

The goal of an organized and coordinated response to an MCE should be to maximize the number of lives saved. At the same time, there should be a goal to provide the greatest comfort and minimize the psychological suffering of those whose lives may be shortened as a result of an MCE. These issues fall under the broad rubric of palliative care, which refers to the aggressive management of symptoms and relief of suffering.

The overarching issue of how to provide optimal support for the dying, those facing life-limiting illness or injury, and those caring for them must be integrated into initial planning efforts as well as addressed throughout the response to an MCE, as discussed in Chapter VII.

Case Study: Influenza Pandemic

The concepts, strategies, and approaches that planners need to consider in the context of an MCE highlighted in the chapters of the planning guide are applied to a specific case study scenario. The case study selected involves a potential influenza pandemic. The key issues that planners need to consider when faced with the challenges of allocating scarce resources in the context of a pandemic are presented in Chapter VIII.

MCE Advance Planning Themes and Recommendations

In the event of a catastrophic MCE, community planners will face the challenge of allocating scarce resources in a timely enough fashion to prevent undue illness and death. As the chapters of this guide indicate, in order to prepare for such an eventuality, planners need to focus on the following:

- BE PROACTIVE. Good planning must be undertaken ahead of time. Planners should anticipate to the degree possible the types of health care needs and resource shortfalls that will occur, and they must identify policy and operational adjustments that will need to take place in response.

- BUILD AND MAINTAIN RELATIONSHIPS. It is important to forge partnerships, memoranda of understanding, interhospital agreements, and other relationships with key stakeholders from the health care system, emergency management system, State and local public health systems, local emergency responders, emergency medical services, home health care, and other medical providers; volunteer agencies; public safety; and other public and private partners at all levels (State, local, regional, and Federal).

- ESTABLISH REGIONAL AND LOCAL MULTIAGENCY COORDINATION. Public and private health agencies, facilities, and responders must have a common vision within their cooperative regional area for how they will function during a disaster. Regional coordination may involve regions within a State or between States, particularly when a metropolitan area is situated in more than one State. Multiagency coordination may take the form of a planning committee, an extension of a Metropolitan Medical Response System, or something else. Regardless of the form it takes, the key is to provide a mechanism for cooperative coordination of activities, resources, and policy across multiple agencies and jurisdictions.

- DEVISE, MODEL, AND EXERCISE MCE RESPONSE PLANS. Plans must include ways to increase surge capacity in anticipation of large numbers of patients needing care in the face of scarce resources. Stakeholders should understand and practice the processes that responders and health facilities will use to request resources from each other, from supply vendors, from special stockpiles, and from emergency management contacts. Opportunities such as special events (e.g., major sporting events, political conventions) can be used to test disaster planning.

- ESTABLISH CLEAR CHANNELS OF COMMUNICATION to link the public health community, diverse health care entities, and emergency response systems. A process must be in place for sharing accurate, real-time situational information with involved stakeholders across multiple jurisdictions.

- ESTABLISH CLEAR MESSAGES AND COMMUNICATIONS STRATEGIES to inform the public about the status of the event and what actions they should take. It is important to work with the media, 9-1-1 dispatchers, special information phone lines, and other communications mechanisms to share clear and accurate messages.

- EMPHASIZE PREVENTION. Planners should recognize the preeminent value of prevention. This is particularly true in MCEs such as an influenza pandemic, where a focus on prevention of transmission is critical to minimizing the burden of disease.

- CLARIFY THE PROCESS FOR LEADERSHIP AND COORDINATION. It is critical to identify leaders, alternates, and the decisionmaking process for resource allocation and policy guidance.

- IDENTIFY EXISTING NATIONAL AND STATE TOOLS, PROTOCOLS, AND PROCESSES for each phase of the MCE. Many products and resources have been developed to help plan for catastrophic events. Numerous examples of these are presented within the chapters of this guide.

CONSIDER THE LEGAL AND ETHICAL ISSUES RELATED TO PLANNING AND RESPONDING TO AN MCE. Planners must be familiar with State emergency powers and have a solid understanding of what types of events or circumstances would trigger their implementation. Planners also must be familiar with the ethical principles that underlie decisionmaking for the allocation of scarce resources.

INTEGRATE PALLIATIVE CARE STRATEGIES ACROSS THE PLANNING PROCESS. Plans should be made for how to care for individuals who are not expected to survive the MCE and how to support the family members and others who are caring for them.

- CONSIDER THE FINANCIAL IMPLICATIONS OF RESPONDING TO AN MCE and the potential need to enact administrative or policy changes to facilitate reimbursement and recordkeeping obligations.

- CONSIDER VULNERABLE POPULATIONS. Explicit planning must occur at all levels for vulnerable populations including infants, children, the frail elderly, pregnant women, the disabled, the mentally ill, and special needs groups with chronic medical conditions (e.g., cardiac, dialysis, HIV and oncology patients). Prior experience has demonstrated that without explicit planning, the needs of these populations will not be adequately met.

- DEVELOP ROBUST SECURITY PLANS. Security is especially important in the case of a large-scale MCE due to the chaos and confusion that it engenders. Having a uniformed presence (e.g., hospital security personnel, off-duty police officers, National Guard members, volunteers) helps maintain order as do clear identification tags; visiting rules; and procedures for accessing supplies, service sites, and patients.

Clearly, the optimal allocation of scarce resources in response to an MCE is unlikely to occur without proper advance planning at the health care facility, community, State, and Federal levels. Simply put, the goal of this planning guide is to promote and assist in those efforts.

Chapter I. Introduction

The Context: A Mass Casualty Event

In the event of a catastrophic public health or terrorism-related event, such as an influenza pandemic or the detonation of improvised nuclear devices, the result is likely to be tens of thousands of victims whose needs will overwhelm the resources of a community's health care system. Indeed, if the event incapacitates health care workers, damages facilities, or destroys supplies, the capacity of the health care system to respond to the tremendous surge in demand for its services already may be severely compromised. If other communities are faced with similar demands (as would be the case in an influenza pandemic or a nuclear detonation, for example), the arrival of additional health care resources, including assistance from the Federal Government, likely would be significantly delayed. Additional resources may not arrive at all.

In this dire scenario, which we refer to as a mass casualty event (MCE), it will be necessary to allocate scarce resources in a manner that is different from normal circumstances but appropriate for the situation if the health care system is to remain functioning and save as many lives as possible. Making optimal decisions concerning the allocation of scarce resources in an MCE could make a big difference in the degree to which health care systems continue to function; ultimately it could save many thousands of lives.

EXAMPLES OF TWO CATEGORIES OF MCE

Figure 1. Immediate (Sudden Peak) Impact

Explosions, Airplane or Train Crashes Due to Bombings (e.g., Madrid Train Bombings), Earthquakes

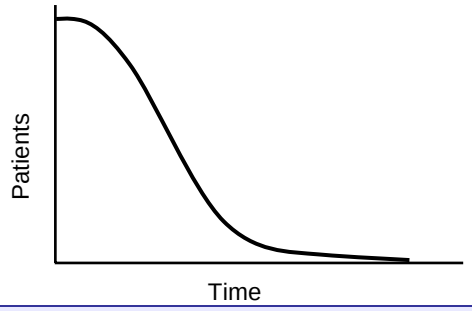
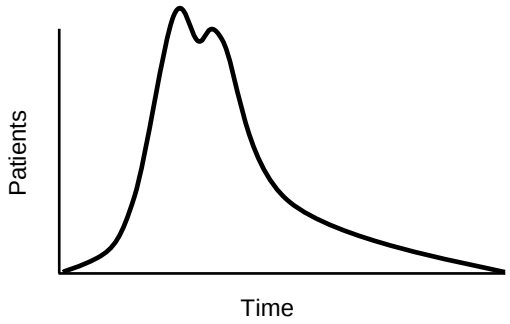


Figure 2. Developing (Sustained) Impact

Anthrax, Smallpox, Flu Pandemic



Types of MCEs

In general, MCEs can be organized into two categories: (1) those that result in an immediate or sudden impact and (2) those that result in a developing or sustained impact. A schematic representation of the two types of MCE is shown in Figures 1 and 2; this is for illustrative purposes only, as the duration and magnitude of the two events would vary.

The first category of MCE includes events such as the detonation of a bomb or a series of dirty bombs, airplane or train crashes as a result of bombings, and earthquakes. This immediate

impact category is characterized by large numbers of casualties at the outset of the event that generally taper off. In some cases there may be a second wave of casualties due to depleted resources or such factors as secondary exposure to natural elements, unclean water, and contagious diseases.

The second MCE category features events such as a massive exposure to anthrax or smallpox. Another example of this second type of MCE, and one that we discuss in detail in Chapter VIII of this guide, is the potential case of an influenza pandemic, in which there would be a gradual increase in the number of people affected, rising to a catastrophic number of patients. In this type of MCE, the number of cases may decline due to treatment and prophylactic efforts, for example, only to increase due to reinfection with a different strain or as a result of an additional wave or waves of the disease. This second type of MCE would necessitate a more sustained response, as the impact would be felt over a much longer period than the immediate-impact MCE.

Planners also need to consider situations in which the event destroys essential infrastructure (such as a nuclear detonation or natural disasters such as Hurricane Katrina), resulting in a crisis requiring a mass migration of survivors. In such circumstances, the delivery of basic care should be contingent on the recognition that all victims of a disaster should be accorded basic humanitarian rights, including "the right to life with dignity." In the international disaster response arena, the Sphere Project has developed "minimum standards" in six critical areas – water supply, water sanitation, nutrition, access to food, shelter, and health care services – required for all victims of disaster. It would be useful to consider these minimum standards in the context of MCE response planning.

The Sphere Handbook is available on the Web at http://www.sphereproject.org/handbook/.

It is also important for planners to consider relaxation of standards for emergency medical services (EMS), for instance, when and if these resources are scarce or unavailable. This approach would facilitate evacuation of survivors, which may be the primary life-saving intervention. Such relaxation of standards might include reducing the number of personnel required per vehicle, using nonstandard vehicles, and using nonprofessionals as volunteer drivers, for example.

Planners also need to consider relieving pressure on EMS systems during an MCE by using call centers (e.g., poison centers, nurse advice lines, public health hotlines, etc.) to answer the public's questions and address their concerns. These issues are discussed further in Chapters IV and V of this guide.

Planners should recognize an important distinction in the level of preparedness between the two types of MCEs. The sudden impact MCE -- explosions and train bombings, for example -- is unpredictable and requires an immediate response in terms of the need to triage and temporize until the necessary resources arrive. In the case of a developing MCE, the rising numbers of

victims poses significant resource problems if the MCE is nationwide. The impact of an influenza pandemic, for example, could be considered predictable, and preparedness planning efforts could be made to mitigate its impact through prevention and public education.

Thus, planners need to be aware of the important distinctions between the two types of MCEs, as well as the implications of these distinctions in terms of the demands on the health care system and the type of response required. Regardless of the type of MCE for which planners are preparing, however, planning must occur prior to the event.

Advance Planning – Guiding Principles

Regardless of the type of MCE, advance planning is critical. Thus, the purpose of this guide is to provide State and community planners with information, recommendations, and resources that can encourage and support MCE planning efforts.

To inform the development of this guide, the authors referred to the recommendations of a 2004 expert panel,[1] which articulated five principles that should steer the development of MCE response plans.

These guiding principles have served as the framework for the development of this planning guide. They have helped formulate the topics of specific chapters and also are applied across all chapters.

Guiding Principles

Principle #1: In planning for an MCE, the aim should be to keep the health care system functioning and to deliver acceptable quality of care to preserve as many lives as possible.

Principle #2: Planning a public health and medical response to an MCE must be comprehensive, community based, and coordinated at the regional level.

Principle #3: There must be an adequate legal framework for providing health and medical care in an MCE.

Principle #4: The rights of individuals must be protected to the extent possible and reasonable under the circumstances.

Principle #5: Clear communication with the public is essential before, during, and after an MCE.

PRINCIPLE #1 has set the foundation for each chapter's discussions within the context of the fundamental tenets of maximizing good outcomes for the greatest number of people while having agencies, organizations, and individuals act in good faith to meet their duties and obligations in the face of an MCE. This first principle provides the underpinnings for the ethical, legal, and practical planning considerations relating to the allocation of scarce resources in a catastrophic situation. Discussions regarding this principle have included the question of what becomes of those individuals who cannot be saved or are not expected to survive as a result of the MCE episode itself or because of the lack of resources. Thus, the issue of providing palliative care to

the individuals who cannot be saved has been integrated into planning considerations throughout this guide and also constitutes a separate chapter (VII).

PRINCIPLE #2 touches on an underlying reality of disaster management, which is that catastrophic events need to be handled at the lowest possible geographic, community, and jurisdictional levels with clear advance plans for the local and regional coordination of available services, staff, and resources. The themes of comprehensive incident management, coordination, and regionalization are central for MCE planning, and they are discussed throughout the chapters of this planning guide.

PRINCIPLE #3 addresses legal issues associated with providing care in an MCE and the resulting decisions regarding the allocation of scarce resources. These issues are the focus of Chapter III.

The rights of individuals, which are addressed in PRINCIPLE #4, constitute the basis of Chapter II. That chapter looks at the ethical issues involved in planning and responding to MCEs.

The importance of PRINCIPLE #5, communicating with the public, is recognized throughout numerous considerations and recommendations related to managing the "worried well," sharing reliable information and instructions with the public, and emphasizing the role of home care and individuals in supporting the health care demands of an MCE. In addition, the issue of developing and testing communication mechanisms to link MCE responders, health systems and institutions, public health, and local authorities also constitutes an area of focus throughout this guide.[1]

Advance Planning – Overarching Themes and Recommendations

In the event of a catastrophic MCE, whether an immediate or a developing one, community planners will face the challenge of allocating scarce resources quickly enough to prevent undue illness and death. As the following chapters of this guide indicate, to prepare for such an eventuality planners need to take several steps.

BE PROACTIVE. Good planning must be undertaken ahead of time. Planners should anticipate to the degree possible the types of health care needs and resource shortfalls that will occur, and they must identify policy and operational adjustments that will need to take place in response. Many useful planning lessons can be learned and applied from real case responses to natural and manmade events in the United States and abroad (e.g., Hurricanes Rita and Katrina in the United States, the London public transport bombings, the Madrid train bombing, the 2004 tsunami in southern Asia).

BUILD AND MAINTAIN RELATIONSHIPS. It is important to unite and forge partnerships, memoranda of understanding, interhospital agreements, and other relationships with key stakeholders from the health care system, emergency management system, State and local public health systems, local emergency responders, emergency medical services, home health care, and other medical

providers; volunteer agencies; public safety agencies; and other public and private partners at all levels (State, local, regional, and Federal).

ESTABLISH REGIONAL AND LOCAL MULTIAGENCY COORDINATION. Public and private health agencies, facilities, and responders must have a common vision within their cooperative regional area for how they will function during a disaster. Regional coordination may involve regions within or between States, particularly when a metropolitan area is situated in more than one State. Multiagency coordination may take the form of a planning committee, an extension of a Metropolitan Medical Response System, or something else. The key is that it provides a mechanism for cooperative coordination of activities, resources, and policy across multiple agencies and jurisdictions.

DEVISE, MODEL, AND EXERCISE MCE RESPONSE PLANS. Plans must include ways to increase surge capacity in anticipation of large numbers of patients needing care in the face of scarce resources. Stakeholders should understand and practice the processes that responders and health facilities will use to request resources from each other, from supply vendors, from special stockpiles, and from emergency management contacts. Opportunities such as special events (e.g., major sporting events, political conventions) can be used to test disaster planning. Plans should be modified and refined continually based on input and lessons from response partners, exercises, and changing conditions.

ESTABLISH CLEAR CHANNELS OF COMMUNICATION to link the public health community, diverse health care entities, and emergency response systems. A process must be in place for sharing accurate, real-time situational information with involved stakeholders across multiple jurisdictions.

ESTABLISH CLEAR MESSAGES AND COMMUNICATIONS STRATEGIES to inform the public about the status of the event and what actions they should take. It is important to work with the media, 9-1-1 dispatchers, special information lines, and other communications mechanisms to share clear and accurate messages such as the status of the MCE, how individuals should protect themselves and others, when it is safer to stay home, how to provide the best possible care at home, where to go for particular services, and when to go or not to go to the emergency room.

EMPHASIZE PREVENTION. Planners should recognize the preeminent value of prevention. This is particularly true in MCEs such as an influenza pandemic, where a focus on prevention of transmission is critical to minimize the burden of disease.

CLARIFY THE PROCESS FOR LEADERSHIP AND COORDINATION. It is critical to identify leaders, alternates, and the decisionmaking process for resource allocation and policy guidance.

IDENTIFY EXISTING NATIONAL AND STATE TOOLS, PROTOCOLS, AND PROCESSES for each phase of the MCE. Many products and resources have been developed to help plan for catastrophic events. Numerous examples of these are presented in the chapters of this guide.

CONSIDER THE LEGAL AND ETHICAL ISSUES RELATED TO PLANNING AND RESPONDING TO AN MCE. Planners must be familiar with State and local emergency powers and have a solid understanding of what types of events or circumstances would trigger their implementation.

INTEGRATE PALLIATIVE CARE STRATEGIES ACROSS THE PLANNING PROCESS. Plans should be made for how to care for individuals who are not expected to survive the MCE and how to support the family members and others who are caring for them.

CONSIDER THE FINANCIAL IMPLICATIONS OF RESPONDING TO AN MCE and the potential need to enact administrative or policy changes to facilitate reimbursement and recordkeeping obligations. Take into account any funding from the Centers for Disease Control and Prevention's Public Health Emergency Preparedness Program and Health Resources and Services Administration National Bioterrorism Hospital Preparedness Program.

CONSIDER VULNERABLE POPULATIONS. Explicit planning must occur at all levels for vulnerable populations including infants, children, the frail elderly, pregnant women, the disabled and the mentally ill, and those with chronic medical conditions (e.g., cardiac, dialysis, HIV, and oncology patients). Experience has demonstrated that without explicit planning, the needs of these populations will not be adequately met. For example, planners must consider pediatric issues, such as differences in physiology, anatomy, development, and emotions, that require appropriate planning and equipment. Planners must ensure that appropriate expertise is included for vulnerable populations and recognize the value of specialty caregivers.

DEVELOP ROBUST SECURITY PLANS. Security is especially important in the case of a large-scale MCE due to the chaos and confusion such an event engenders. Having a uniformed presence (e.g., hospital security personnel, off-duty police officers, National Guard members, volunteers) helps maintain order as do clear identification tags; visiting rules; and procedures for accessing supplies, service sites, and patients.

Clearly, the optimal allocation of scarce resources in response to an MCE is unlikely to occur without proper advance planning at the institutional, community, State, and Federal levels. Simply put, the goal of this document is to promote and assist in those planning efforts.

Organization of the Guide

This planning guide is organized as follows:

- Chapter II contains a discussion about the **ETHICAL ISSUES** that must be taken into consideration by planners.

- Chapter III highlights the KEY LEGAL ISSUES that must be considered in developing a plan for responding to an MCE.

- The succeeding three chapters (Chapters IV, V, and VI) examine the important issues, considerations, strategies, models and tools related to MCE planning at THREE DIFFERENT SITES/SETTINGS: PREHOSPITAL CARE, HOSPITAL AND ACUTE CARE SETTINGS, AND ALTERNATIVE CARE SITES.

- Chapter VII discusses the issues and approaches associated with providing PALLIATIVE CARE to the dying or individuals who are not expected to survive and offering support to the people who care for them during MCEs.

- Finally, Chapter VIII pulls key issues and strategies from all of the previous chapters and summarizes them in the context of an INFLUENZA PANDEMIC CASE STUDY.

It is hoped that the information and material presented in this guide will enable community planners to prepare effective MCE response plans.

Endnote

1. *Altered Standards of Care in Mass Casualty Events: Bioterrorism and Other Public Health Emergencies*. AHRQ Publication No. 05-0043. Rockville, MD: Agency for Healthcare Research and Quality; April 2005, 16-18. Available at: http://www.ahrq.gov/research/altstand/index.html. Accessed November 27, 2006.

Chapter II. Ethical Considerations in Community Disaster Planning

AUTHOR

Marc Roberts, Ph.D., Professor of Economy, Department of Health Policy Management, Harvard University

CONTRIBUTING AUTHOR

Evan G. DeRenzo, Ph.D., Bioethicist, Center for Ethics, Washington Hospital Center, Washington, DC

This chapter discusses the range of ethical issues that are critical to shaping any community's disaster response planning as well as the implementation of those plans. The chapter explores what it means to plan for and act ethically in a disaster situation and underscores the importance of advanced planning for making choices that are ethically sound.

Context for the Discussion

We live in a world where a whole range of manmade and natural disasters (and cases that mix the two) are increasingly of concern to communities across America. Terrorism, epidemics, hurricanes, earthquakes, fires, floods – all of these are all too possible in an industrialized and interdependent world. Our settlements increasingly impinge on inherently risky terrain, such as over fault lines or on barrier islands. Ever-improving worldwide transportation and communication systems increase our vulnerability to those motivated by destructive ideologies. These same systems also make possible the "jet spread" of new infectious disease – as Toronto found out during the SARS outbreak.

In such a world, serious and systematic disaster planning and preparedness at the community level is essential. If a disaster does occur, communities must be prepared for the possibility that government assistance may be delayed or may not arrive at all. Government agencies may be overstretched by multiple challenges or have their ability to function degraded by catastrophic events.

One reality is clear. Communities that have not planned and prepared for such an eventuality will be less well-equipped to face its complexities than communities that have. The noted political scientist Richard Neustadt once wrote, "Crises are a bad time to do planning. Only if plans are developed in advance, and then critiqued, rehearsed, and refined, will various agencies and actors be able to respond effectively to a disaster."

> Serious and systematic disaster planning and preparedness at the community level are absolutely essential.

Once a planning process is undertaken, it will become clear almost immediately that serious ethical decisions are central to shaping any community's disaster response. This will be true of both the planning phase and the implementation phase. At the planning phase, there will be innumerable issues, each with its own ethical components. Whom do we protect, and to what level of safety? How do we set budgets and priorities? Answers arrived at during the planning stage should be based on ethical analysis that can provide guidance during implementation even if the planned solutions must be altered in real time. Other issues include:

- Who do we evacuate first?
- How do we deal with those who do not want to cooperate?
- When do we stop expending resources on rescue efforts and shift to recovery mode?

The way these questions are answered reflects the ethical perspectives and moral analysis strategies of the planning group(s).

We also need to expect that planning will be imperfect. Unexpected events will occur. Operational failures will develop. Those with field responsibility will have to make on-the-spot decisions that will require ethical judgments. For that reason, it is important that ethical considerations are made explicit during the planning process so that when on-the-spot decisions must be made they can be made consistent with the spirit of the ethical judgments that guided the planning process.

Ethical Ideas as a Resource for Disaster Preparedness

Human beings have been thinking and writing about ethics in general, disaster management in particular, and the application of ethical ideas to public policy for as long as we have been thinking and writing. Literally 5,000 years ago, the Egyptians struggled with their idea of *maat* – by which they meant the appropriate good order of society – and the role of the Pharaoh in preserving or restoring that when the annual Nile floods got out of hand.

In the 19th century, various thinkers began to try to apply technical and scientific reasoning to public policy problems. French engineers argued that the value of a bridge across the Seine was what people would pay for it, even if they in fact paid nothing because the bridge was free. Florence Nightingale tried to convince the British government to improve medical care for wounded people in the Crimean War by showing that the cost of replacing a soldier was greater than the cost of saving one. These ideas found clear expression in the English philosopher Jeremy Bentham's utilitarian claim that public policy should maximize the good across the greatest number. Utilitarian theory, or what is often referred to as consequentialist ethics, assesses what is right or good based on whether the consequences of the actions to be taken will be good.

Another strand of thought, arising contemporaneously and in opposition to consequentialist ethics, is the duty-based ethical perspective. Advanced most notably by Immanuel Kant and referred to formally as deontology, duty-based ethics focuses on nonconsequentially based notions of good. In duty-based ethics, deciding what is right or good is based on meeting duties and obligations.

Both theoretical perspectives have obvious applicability to planning for mass-casualty situations. Both have weaknesses, however, that need to be taken into account when either is invoked as a justification for proposed policy. Consequentialism suffers from two main weaknesses. First, it is difficult to predict consequences. Especially under emergency conditions, reality often looks little like what was expected. Second, in maximizing the good across the greatest number, the rights and welfare of the few can be ignored or, worse, trampled. Duty-based ethics provides a counterweight but one that is imperfect also. The main weaknesses of uncritical application of duty-based justifications are that duties and obligations are difficult to delineate and that even when they are delineated, invariably conflict. In planning for a mass disaster, for example, it will be difficult for communities to clarify the scope of obligations for the multiple players involved.

Even where duties and responsibilities are clear, it is likely that persons and organizations will have conflicting duties, such as physicians to patients as well as to their own families.

Nonetheless, applying these theoretical perspectives in systematic ways can address our contemporary concerns for upholding important ethical principles and values, such as fairness and equity, and for the role such principles and values play in disaster preparedness. Making explicit and transparent the ethical perspectives raised during the planning process can build commitment to any plan that is created.

As this overview suggests, the ethical ideas that are widely shared in our culture are neither simple nor consistent. It is easy to invoke the notion of the greatest good, but attempting to maximize the good while providing universal assistance is a complex task indeed. That is, how do we incorporate the various appreciations of doing good into concrete policies in disaster preparedness planning? For example, do we measure "good" by lives saved or years of life saved? Our priority setting would be very different depending on how we answered that question. The same is true of concerns about "rights" and "fairness." How much are we obligated to spend to save people from a flood who refuse to evacuate when told to do so?

How do we balance maximum gain against fairness when these conflict? Such decisions need to be based on sound ethical judgment. All of this implies that using ethical ideas to guide disaster preparedness is a complicated business. The process will inevitably involve judgment and compromise. The broad ideas will have to be made applicable to specific contexts, refined, and defined in operational terms. And these realizations have important implications for what communities need to do, in both planning and implementing disaster plans, if they are to act in an ethically responsible manner.

What Would It Mean to Plan for and Act Ethically in a Disaster Situation?

The ethical obligations of the professionals in a community responsible for disaster planning and preparedness obviously begin well before any disaster actually occurs. The first of these has to do with what might be called "ethical preparedness." We have noted the ambiguity and conflict inherent in some of the principal ethical norms that planners might want to invoke to guide their actions. This implies that waiting for a disaster to occur to face these challenges means waiting too long. We all know that buses or radios or vaccine stores cannot be conjured up at the last minute. By the same token, the reality of a catastrophic event will play out differently than could have been imagined so that tough choices will have to be made in the midst of crisis. Sound planning can take this expectation into account by providing ethical guidelines and principles for making tough choices in a real-time environment.

Thus, it is advisable that the planning process anticipate judgments that will have to be made and then model making such judgments explicit and shared widely. Applying and practicing applying

such transparency serves multiple purposes. First, like any other "strategy" or "mission" statement, being open about guiding ethical principles can be an important management tool. It can serve to coordinate activity and produce more consistent implementation when decisionmaking has to be decentralized to frontline workers and their supervisors. That often will be the case in a disaster situation.

Transparency also serves the goal of accountability. Priority-setting judgments are not purely technical matters. In a democratic society, citizens have a right to know what decisions public institutions make on their behalf – especially when the stakes are high as in the life-or-death choices that a disaster can produce. Such public knowledge also serves to open the process to public feedback, criticism, and discussion. This can help professionals ensure that their plans reflect community values and concerns.

Public discussion also serves the vital purpose that some have called "democratic education" or "civic capacity building." Only when the public openly discusses and debates difficult choices does the capacity of community members to fulfill their roles as "citizens" become appropriately enhanced. We can expect the public to accept and support difficult choices in difficult times only if they have become knowledgeable about and committed to those choices beforehand and if they feel they have had some input into the process. Transparency is a prerequisite to such outcome.

Transparency alone, however, will not suffice. The processes for making decisions themselves also have to meet their own ethical tests. Here, two ideas about democratic participation seem especially relevant. First is the need for the collaborative involvement of elected officials from all levels of government with local planners and citizens groups. Elections are, after all, the method democracies use to choose their leaders and, in the process, to resolve important value controversies. Different from the role of governmental agency officials is the equally important role of technical experts. Technical expertise is essential for clarifying options and being clear about alternatives. But what technical experts are expert about is the science: how influenza viruses are likely to mutate, the storm resistance of levees, or the atmosphere transport of radioactivity. They are not "moral experts." When it comes to making ethical judgments under stressful and complex conditions in which diverse value perspectives must be harmonized, technical expertise confers no special moral importance during ethical discussions. For community commitment to congeal around a disaster preparedness plan that will include judgments about complex moral problems such as tradeoffs between cost-effectiveness and fairness or the relative importance of prioritizing attempts to save one population group before another, we rely on politics – the combined actions of those we elect, those who are appointed, and local citizens working together.

Responsible elected leaders do need input, however, both on the science and on community values. Elected bodies (city councils, State legislatures) have their virtues and values in this regard. Further, there will be a role for more direct citizen participation. What is at issue here is an opportunity for discussion among a cross-section of community leaders, both those with a

special competence and responsibility and those with an especially large stake in disaster planning decisions. Such a group can bring knowledge, sensitivity, and realism to the process that more general political bodies do not possess.

It is vital to remember that all community-planning and participatory processes are subject to certain risks. One risk is that those groups with more resources or expertise will dominate. Another risk is that some will seek to hold up the process by refusing to cooperate unless their narrow demands are met. All this suggests a need for careful planning, effective outreach, impartial staff support, and other now-well-understood prerequisites if the right kind of discussion is to occur.

The ethics of disaster planning apply not only to the process but also to the plan itself. In fact, almost all participants in the planning process face conflicting interests, if not frank conflicts of interest. Politicians seek political support, care-giving institutions want additional resources, and various first-responder agencies (State and local, police and fire) will maneuver for authority and leadership. The standard to which the resulting plan should be held *is not* that of meeting any one player's interests. Rather, the standard should be whether it meets some broader ethical tests and concerns, as we discuss further below.

Only a plan that transcends narrow interests will convince citizens that the public leadership entrusted with disaster preparedness is meeting its responsibilities. Those responsibilities include not just the exercise of technical "competence" but what the economist Kenneth Arrow called "conscience" while he was discussing clinical medicine, an argument that applies similarly here. A doctor or a disaster manager knows more than his or her patient or the at-risk public. As a consequence, the manager asks his or her experts to act as his or her "agents." This means asking the expert to make decisions in keeping with the goals and values of the "principal" who retained them. And "conscience" is required when the agent has to disregard his or her own interests to fulfill the trust placed in the agent; for example, by not ordering an unnecessary test or by risking one's own life in a burning building. As Woodrow Wilson said about the treaty to end World War I, "open covenants openly arrived at" serve everybody's interests.

Only a plan that transcends narrow interests will convince citizens that the public leadership entrusted with disaster preparedness is meeting its responsibilities.

Perhaps one of the most important roles of effective planning is to shape citizen expectations appropriately. When leaders are not realistic, the government's performance fails to live up to expectations, and citizens' trust in collective responses to community problems seriously erodes. Realistic plans and expectations, in contrast, can build public trust. The government then can meet those expectations, and a community's belief in its own capacity is thereby enhanced. The resulting "social capital" (to use Robert Putnam's phrase) is a valuable resource that communities surely will need if or when a real disaster does occur.

Addressing the Ethical Aspects of Emergency Preparedness Planning

When planning for emergencies, whether related to terrorism, epidemics, hurricanes, earthquakes, fires, floods or any other manmade or natural cause, the quality of the planning process will contribute markedly to the degree of preparedness and response success. Given that preparedness planning is complex and must involve all layers of public institutions and private citizenry, there will be disagreements about how best to organize, plan, and implement emergency response strategies. Any disagreement that arises will spring, in large part, from differences in ethical judgments. Explicit awareness that disagreement involves moral disputes is a requisite starting point for resolving ethical differences in ways acceptable to the needs of planners and citizens.

It is critical that all parties appreciate that moral disagreement is not only inherent to the planning process but necessary for a sound outcome. In the event of an emergency, multiple institutions, agencies, and individual citizens will have to be committed to implementing the plan. There must be a spirit of cooperation. Prospects for such commitment and cooperation are strengthened when the various parties believe that the planning process has been conducted ethically. Acceptance of this point is required for an appropriate process to be created that allows for vigorous deliberation. A truly ethical planning process will be in place only through a process that builds in mechanisms for managing ethical disagreement and the deliberative conversations necessary to work through the disagreements.

The first building block in addressing the ethical aspects of preparedness planning is creating planning groups that comfortably tolerate vigorous debate. Given that most persons and groups tend to avoid open conflict, the leaders of preparedness planning groups must have sufficient emotional strength and group dynamics leadership skills to competently surface the moral disagreements that will invariably exist across group members and then ride the waves of argumentation until a reasonable moral consensus is built. In so doing, provided that the group is sufficiently inclusive and their work transparent, the resultant plan can be expected to have solid commitment from those that group members represent. Even if there are particular group members who did not get everything they wanted, a well-argued agreement coming out of a seriously and thoughtfully deliberated ethical disagreement will garner the needed sense of fairness for future cooperation to be a reasonable expectation.

A good disaster plan, however, does more than just explicitly confront tough choices. A good plan also will minimize the need for such choices by putting adequate resources and effective arrangements in place. In desperate situations, resources will indeed be overwhelmed. Moreover, resources are always scarce. Preparedness has to compete with schools and prisons and highways and environmental protection for limited public dollars. There never will be enough money to do everything, but the better the plan, the less wrenching and difficult it will be to carry out that plan when adverse events do occur. In that sense, disaster planners need to defend both their own interests and those of their communities through the planning process.

A good plan also will minimize the need for tough choices by putting adequate resources and effective arrangements in place.

Ethical Principle I: Focus on Consequences

As noted previously, often the first ethical principle invoked in disaster situations is Bentham's "greatest good for the greatest number," which is commonly interpreted as requiring us to save the most lives, but again, the devil is in the details. Do we measure "good" by lives, years of life, or quality-adjusted years of life? If we use years of life, the young take precedent over the old. At any given age, the healthy would be saved before the sick and women before men – since the former has a longer life expectancy than the latter.

Those who pursue a utilitarian approach to policy development define the "good" strictly in terms of maximization of benefits for the many. In the case of utilitarian economists, for example, most want to measure "good" subjectively – based on how people feel about various alternatives as expressed in their market choices. Thus, if someone prefers to remain in his or her home during a hurricane, some economists would say that that represented the "greatest good" for that individual.

Public health specialists, engineers, and disaster managers who also have a philosophical preference for consequentialist analysis tend to focus on objective measures of the "good" of the "greatest number" – on lives saved or safety margins or probabilities. This contrast helps us understand what is at issue whenever someone asks, "Why can't I build my house in a flood plain if I am willing to take the risk?" Disaster planners in this case are confronting someone who believes that decisions on what is good are best decentralized to the individual. One consequentialist way for disaster planners to proceed is to pick some metric of gain and then to design plans to produce maximum "expected value." (For each possible choice, consider the weighted sum of the gains produced by each possible outcome – with the outcomes weighted by their probabilities. Then take the choice when that magnitude is greatest.) A considerable field of literature in areas like decision theory and operations research addresses the technical details of using this approach – on choosing metrics, assigning values, and estimating probabilities.

Uncritically applying a utilitarian understanding to such values preferences, however, will not capture the breadth of ethical assumptions embedded in planning approaches to addressing this concrete prospect. Moreover, there are limits to the appeal of the impartial brutality of "the greatest good" approach – even in a disaster situation. Much real planning and decisionmaking revolves around other ethical ideas. We need to understand these as well to be better equipped to provide for effective disaster preparedness.

Ethical Principle II: Focus on Duties and Obligations

Utilitarianism is often not the only basis for much public policymaking. For example, our willingness to restrict, or not, individual choice both before and during a disaster can have a utilitarian justification but it is just as likely to be deeply influenced by duty-based concerns. The core idea here begins with the need to respect all human beings. Different writers root that respect in either a religious argument (the possession of an immortal soul) or a secular one (the human capacity for reasoned choice). Regardless of its origins, however, that respect is said to require us to treat every human being as "an end in themselves" (to use Kant's famous phrase). This means we cannot sacrifice some for the sake of others – unless they volunteer. For example, economists argue for individual choice in part because they presume that each person's decisions affect only themselves. Many disaster-related decisions, however, have what economists call "externalities" – they affect others beyond the decisionmaker. In particular, those who build in flood plains or refuse to follow evacuation orders may impose the cost of expensive search, rescue, and recovery efforts on the community.

Deciding how and why to divert resources from some sector of community need to others should rest not only on predictions of what will produce the best outcome for the most persons but also should include considerations of how the resource distribution process will work to ensure that obligations citizens vest in their Federal, State, and local governments are met. This balance between utilitarian and duty-based assumptions is at work in our ethical considerations about allocating scarce influenza immunizations. A policy aimed at "lives" would give priority to the old and the sick, since they are most at risk from influenza. A policy aimed at "years of life" might be somewhat different – prioritizing the vulnerable young. A policy that took account of economic consequences would raise the priority of workers who mattered most in economic terms (too bad for the unemployed). The potential real-world outcomes of balancing and interweaving these two ethical perspectives are highlighted in thinking about influenza vaccination of health care providers. In a serious crisis, those health care workers who cared for influenza patients might get priority – on the grounds that each of them could save several other individuals through their care. If we were serious about such a rationale, however, cardiac surgeons and other subspecialists would be further down the queue because it might be reasoned that the obligation to provide primary care to our most vulnerable citizens comes before performing more resource-demanding procedures, regardless of the numbers in either group.

In practice, our sense of humanitarian responsibility will not allow us to ignore "stay-behinds" or refuse rebuilding help to those whose houses have come to grief in a storm because of shared cultural understandings of obligations that governments have to citizens and that neighbors have to neighbors.

Ethical Principle III: Rights and Fairness

In addition to having any disaster preparedness planning process make explicit consequentialist and duty-based theoretical notions, refined understandings of what is meant by rights and fairness will be needed as well. Just as most decisions will include some mix of consequentialist and duty-based justifications, most decisions will include a complex of intertwined notions about rights and fairness.

At least in Western philosophical traditions, "rights" refers to the belief that human beings have universal rights regardless of jurisdiction or other characteristics such as gender, ethnicity, or religious belief. Such rights are often defined by international and national laws and legislation. The difficulty for communities engaged in disaster preparedness planning is that one common criticism of rights thinking is that rather than being truly universal, or universalizable, it is prone to cultural relativity. For example, universal primary school education or health care insurance is considered by some nations a right of all their citizens. In other nations they are not seen as such. Laws and social programs, however, have boundaries while mass disasters do not. Moreover, rights and the perceived responsibility of an agency, organization, or individual will differ across State, national, and continental borders. The same problem arises in focusing on defining the concept of fairness. Nonetheless, preparedness planning groups will need to devote substantial effort in coming to at least their own definitions for these ethical principles if they are to devise plans to which the affected communities can commit.

For example, the rights arguments have moved from just advocating the "negative" right to be left alone to concentrating more forcefully on a relatively expansive set of "positive" rights. These rights involve the expectation that the government will ensure everyone some minimum scope of opportunity for living a meaningful life. Indeed, most governments in industrial countries help their citizens – to varying degrees – with food, housing, education, and health care based on such arguments. And such efforts are often focused and financed in a way that is redistributive. Quite typically, upper-income groups cross-subsidize lower-income groups based on notions of "fairness" and "social responsibility" (or, in Europe, "solidarity").

These notions are almost certain to come into play when disaster planners face issues of priority setting. For example, any consideration of property values, in allocating resources, would dictate that less attention be paid to low-income neighborhoods. Yet, as Katrina demonstrated, it is likely to be poorer residents who have the fewest resources of their own and who therefore are most in need of public assistance.

Once issues of fairness or equity are accepted as relevant, it is still necessary for community leaders to decide what fairness requires of them. One view (sometimes called "relative equity") is that any difference in treatment (or in this case, say, of risk) is inherently unacceptable. An alternative perspective (termed "absolute equity") requires governments to provide some minimum level of opportunity to all citizens. If that goal is achieved, then on this second view, the rich or talented can be allowed to have opportunities above the minimum level.

In fact, disaster preparedness almost inevitably has to be concerned with "absolute" equity – with providing some minimum level of protection to all. Inevitably, those with stronger houses, houses on higher ground, or money for comfortable hotels out of town will do better than some of their fellow citizens. Thus, one of the questions planners will have to focus on is not whether any differences exist, but whether appropriately delineated obligations have been met for those segments of the population where such differences result in disproportionate harms.

Of course, just what those obligations are will be a matter of much debate. Again, open processes, explicit decisions, transparent reporting, and political accountability – all of these become especially important when such difficult issues have to be decided.

In a crisis, it well might be that the poorest communities are the ones most in need of help from a State's National Guard assets, precisely because they have fewer of their own resources on which to rely.

Here also is where the decentralized structure of disaster preparedness can become somewhat problematic. Poor jurisdictions are likely to have less in the way of equipment, personnel, and financial reserves than their more prosperous counterparts. Fairness in such cases may require that planners at the regional or State level take account of these realities when decisions are made about allocating resources from higher-level jurisdictions. For example, in a crisis, it well might be that the poorest communities are the ones most in need of help from a State's National Guard assets, precisely because they have fewer of their own resources on which to rely.

Ethical Principle IV – Respect Community Norms

While consequences, duties, rights, and beliefs about what is fair often dominate discussions of public policy, these ideas do not exhaust the ethical considerations that are potentially relevant in such situations. In addition, there is the question of respecting the particular norms and values of a community.

The ideas we have been considering so far are avowedly universalistic in their claims. Their proponents say they apply to everyone, everywhere. There are also ethical ideas that are particular to a given society and express the society's particular sense of itself as a whole or of its separable communities. These, too, have a role to play in disaster preparedness.

One of the most important areas in which such local norms apply is in our expectations of first responders and other disaster personnel. There are many examples of situations where rescue personnel put their own lives in danger on behalf of others or for the greater good of the community. The large number of police and fire casualties in New York on 9/11 testifies to the power of these ideals.

Indeed, when disaster managers try to implement "greatest good" policies, often it is front-line personnel, imbued with professional pride and responsibility, who resist. Experienced senior firefighters will tell you that one of their most difficult tasks can be to get their people out of a compromised structure when that becomes the prudent course of action.

On the other hand, some societies have high expectations of even unwilling disaster professionals. During the SARS epidemic in Hong Kong, doctors and nurses at the designated receiving hospital were quarantined inside the building (including some who were confined unwillingly). Several of the staff members of that hospital died in the epidemic.

Another example of the power of the particularity of social ethical norms is revealed by the very high expenditure made post-Katrina on recovering and identifying those who died. While no comprehensive estimates have been made, informal calculations suggest figures in the range of $10,000 to $20,000 per recovered and identified body. Such expenditure is not easy to explain on either "greatest-good" or "positive-rights" principles, since only the living count in such analyses.

Local norms also can affect recovery and rebuilding efforts. After the recent hurricanes, Mississippi and Louisiana have had to confront the question of whether their rules restricting gambling to off-shore locations should be maintained. There have been press reports that efforts to move some Mississippi shrimp boats back into the Gulf are being hampered by a reluctance to disturb a Native American burial ground. Again, where disaster planners and managers decide to respect (or not) local community values, obligations of transparency, explicitness, and accountability clearly apply.

Debate about which ethical principles and theories to apply and how to prioritize them in a specific situation has been going on for millennia. As noted, there are no simple, formulaic schemes for such choices. There are, however, ways of thinking about ethical principles and theories that can help preparedness planners devise strategies for emergency response. These involve *a systematic approach to applying basic ethical principles and theories to any particular situation.* One can create an ethics algorithm that, if consistently applied to planning for any particular kind of emergency, at least can provide reasonable confidence that ethical issues raised by an emergency were well-considered. The ethics algorithm might be constructed as follows:

1. Who are all the possibly interested parties? Think *broadly* -- include not only persons and categories of persons but institutions/organizations/professions/communities.

2. What is the full range of duties and obligations of each potentially interested party, or at least the primarily interested parties? Think of parties as not only individuals but also institutions and groups.

3. How might various duties and obligations of each of the various parties clash/conflict?

4. What might be short-term and long-term consequences, both good and bad, of each possible course of action? How confident are you of your predictive accuracy?

5. What ethical principles are at stake? (Possible ethical principles include respect for persons, beneficence, nonmalfeasance, justice, truth telling, liberty, opportunity, and reciprocity.) Which ones are in tension?

   a. After enumerating the list of principles at stake, work to specify them; refine the meaning of each principle involved. Work to bring the broad abstractions down to the level of the specific situation being discussed.

   b. Make explicit the strategy for use of the principles. For example, for the situation at hand, must all the involved principles be upheld or is the strategy to balance the principles? If a balancing strategy is being applied, make explicit which values/ethical considerations are being balanced off and against which other values/ethical considerations.

6. What might be the intentions of the various players? Evaluate the praiseworthiness or lack thereof, of the motives of the people, organizations, and/or institutions involved.

7. What appears to be the full range of the possible courses of action?

8. Weed out those possible courses of action that appear not to be justifiable based on potentially bad consequences, inability to meet duties and obligations, and/or the ethical soundness, or lack thereof, of intentions.

9. With the possible courses of action that are left, make explicit the justifications for taking each. Then vigorously scrutinize whether or not those justifications are ethically robust.

The sequence in which the analysis called for in numbers 2 through 6 above is conducted may not appear to be of major importance. It is necessary, however, to be able to claim convincingly that all points have been thoughtfully considered and deliberated, with the discussions and decisions fully documented.

Evan G. DeRenzo, Ph.D., Center for Ethics, Washington Hospital Center, Washington, DC.

Summary and Conclusions

This review introduces some of the major, substantive, and competing ethical ideas that community disaster planners and managers are likely to find relevant to their efforts. At best, the review identifies some of those ideas in the broadest terms and sketches some of the more specific issues that each of these perspectives raises. How do you measure good? How far do you go to be fair? When are community norms to be respected or overridden?

In so doing, we argue for making explicit a set of norms that need to apply to how the planning process is conducted (see box).

The arguments for such a process are justifiable by both utilitarian and deontological ethical theories. On the deontological or duty-based side, respect for individual autonomy requires that citizens subject to the power of government be able to influence how that power is used and be protected from its misuse. That can occur through both general political structures and ad hoc participatory processes. If considerations of equity are to be respected, special efforts need to be made to ensure underresourced and underrepresented segments of the community have their say. Corporations and upper-middle-class citizen groups will appear at meetings and file comments, for example, but what about residents of public housing projects?

What Do Ethics Tell Us About What Makes for a Good Process?

- Transparent ethical judgments that confront hard choices
- Involvement and accountability for political leadership
- Broad outreach to the community

Whether one comes to the planning process with a (perhaps unarticulated) philosophical or psychological preference for either a utilitarian or consequentialist perspective, broad participation and accountability have several potential benefits. Local residents may have knowledge and insight about local conditions. Businesses know well what resources they might contribute. Front-line disaster responders and their first-level supervisors will be painfully aware of gaps in their own training and equipment. Maximizing the good across the greatest number and meeting individual and organizational duties and obligations will take the contributions of the many.

Participation and transparency also will help educate citizens and prepare them both to participate in and to accept the implementation of plans when a disaster occurs. They will know what to do, and because they will have been involved, they will understand and therefore more readily will commit to the reasoning behind the plan. They will have more realistic expectations and thus will be more prepared both psychologically and practically.

The process of democratic government, at its best, involves what political scientists call "deliberation." In such conversations, both facts and values are explored, alternatives are examined, and meanings are clarified. When done well, deliberation not only produces good plans but also enhances a community's capacity for self-government. Disaster planning offers a clear opportunity for advancing such goals.

Finally, it is important to remember that in a disaster, difficult choices will have to be made, and that the better we plan, the more ethically sound will be the choices. There is no cookbook for combining conflicting ethical ideas. There is no "one-size-fits-all" method of priority setting, but community disaster planners need to see the opportunities as well as the difficulties that such a situation implies. There is room here for responsibility and choice, for ethical concern and technical excellence, for process skills and scientific expertise. It is surely worth doing and worth our best efforts to do it well.

Practice Applying Ethical Principles to the Preparedness Planning Process

Emergency preparedness planning is, or should be, an iterative process. When preparedness planning groups habituate themselves to the discipline of thorough ethical analysis, they become increasingly skilled at conducting vigorous moral deliberations. Life is full of emergencies, and public institutions responsible for emergency preparedness and response can use any emergency that occurs anywhere to increase their knowledge base for their ongoing planning efforts. An agency that is responsible for emergency response, for example, can take the opportunity of any emergency that has recently occurred to test its own ethical analysis skills. An agency can use a recent emergency as an exercise to see if its own preparedness planning process would have yielded similar or different ethical judgments about response strategies that could have been used. Such post hoc activities allow preparedness planning groups to practice the ethical analysis skills necessary to apply ethical principles and theories to the planning process meaningfully.

Chapter III. Assessing the Legal Environment Concerning Mass Casualty Event Planning and Response

AUTHOR

James G. Hodge, Jr., J.D., LL.M., Associate Professor, Johns Hopkins Bloomberg School of Public Health

Executive Director, Center for Law and the Public's Health, Georgetown and Johns Hopkins Universities

This chapter examines an array of legal issues involved in planning for mass casualty event (MCE) responses. The chapter discusses relevant laws and their potential impact on the ability of community planners to allocate resources when supplies are limited. Community planners are encouraged to partner with members of the State and local legal community to identify specific legal issues and solutions before and during an MCE.

Introduction

Laws at all levels of government are a critical part of emergency responses and allocation decisions involving scarce resources in mass casualty events (MCEs). For the purposes of this chapter, scarce resources broadly include physical items (e.g., medical supplies, drugs, beds, equipment), services (e.g., medical treatments, nursing care, palliative care), and health care personnel (e.g., physicians, nurses, lab technicians, other essential workers in health care settings). Constitutional provisions, statutes, administrative regulations, cases, compacts, mutual aid agreements, and public health or emergency management policies or plans are each implicated in an assessment of the legal environment for MCE responses.

This chapter discusses an array of legal issues concerning allocations of scarce resources organized through a series of major legal themes in emergency responses, including:

- The changing legal landscape during emergencies.
- Balancing individual and communal interests.
- Suspending existing legal requirements.
- Interjurisdictional legal coordination.
- Medical licensure reciprocity.
- Liability and other protections for healthcare workers and volunteers.
- Property management and control.
- Making allocation decisions in real time: legal triage.

Within each of these themes are discussions of relevant laws and their potential impact (both positive and negative) on the ability of community health planners to allocate resources when supplies are limited. In some instances, distinctions between public- and private-sector entities are raised when relevant to the application of the law.

The purpose of this chapter is to frame common legal issues that State and local community health planners may need to address. This chapter is not meant to provide specific legal advice in any jurisdiction. Legal advice on issues identified in this chapter is necessarily fact-specific and may vary depending on State or local law and the specific circumstances involved. Community planners are encouraged to work closely with their State Office of the Attorney General or local counsel to identify specific legal issues and solutions before and during MCEs.

The Changing Legal Landscape During Emergencies

Since September 11, 2001, and the ensuing anthrax attacks, Federal, State, Tribal, and local governments have focused on crafting an appropriate legal environment for public health emergencies.[2] They assessed their emergency authorities and amended or enhanced their legal infrastructure where needed, a process that is still ongoing. The current legal framework for emergency responses presents differing standards for the declaration of an emergency and vests various powers at all levels of government. States or local governments may feature a comprehensive set of government powers arising from the declaration of a public health emergency.[3] Other States predicate their emergency powers on the declaration of a general emergency or disaster, which may include any event that threatens the public's health or safety.[4] Some States allow for the dual declaration of public health emergencies and general emergencies, which can lead to legislative confusion and duplication of efforts that may detract from the implementation of efficient emergency management functions.[5] The Federal Government also has emergency declaration powers that operate independently or in conjunction with State and local emergency response efforts.[6] These emergency powers are summarized below.

For community health planners, the importance of an emergency declaration at any level of government lies in its effect on their operations. Emergency declarations do more than announce a state of emergency in an affected local, State, Tribal, or national population; *they essentially change the legal environment* to facilitate emergency responses for the duration of the declaration.[7] By reshaping the legal landscape to effectuate emergency responses, multiple legal options arise that would not be possible in nonemergency events.

PUBLIC HEALTH EMERGENCIES. Many State legislatures and health departments have amended State statutes and regulations to reflect modern principles of public health emergency preparedness based, in part, on the Model State Emergency Health Powers Act (MSEHPA) drafted in fall of 2001 by the Center for Law and the Public's Health at Georgetown University and The Johns Hopkins University.[8] MSEHPA presents State and local governments with a template for reviewing existing emergency declaration laws and developing legislative or other regulatory reforms to facilitate an effective public health response.[9] While this chapter refers to MSEHPA to explain common provisions that are featured in many States' emergency preparedness laws, MSEHPA is not law unless a State has enacted it. According to the Center, more than 35 States have enacted laws based in whole or part on MSEHPA since the Act's completion.[10] These laws vary across jurisdictions and may be interpreted differently depending on a host of factors.

The Act sets a high threshold for what may constitute a public health emergency, defined as: "an occurrence or imminent threat of an illness or health condition that (1) is believed to be caused by any of the following: (i) bioterrorism (ii) the appearance of a novel or previously controlled or eradicated infectious agent or biological toxin (iii)*[a natural disaster]*, and (iv) *[a*

chemical attack or accidental release] or (v)*[a nuclear attack or accident];* and (2) poses a high probability of any of the following harms: (i) a large number of deaths in the affected population, (ii) a large number of serious or long-term disabilities in the affected population, or (iii) widespread exposure to an infectious or toxic agent that poses a significant risk for substantial future harm to a large number of people in the affected population."[11]

Once a state of public health emergency has been declared, MSEHPA grants State and local public health agencies (and their public and private sector partners) a number of extraordinary public health powers.[12] This includes the ability to waive State professional licensing and certification requirements for volunteer health professionals participating in emergency response efforts,[13] liability protections for medical personnel,[14] and expedited procedures to acquire essential supplies and personnel.[15] These powers are discussed further throughout the themes below.

GENERAL EMERGENCIES AND DISASTERS. Although many jurisdictions do not define *public health emergency* or a like term, every State and many local governments have developed a legal structure for declaring a *general emergency or disaster* and related emergency management functions. A state of emergency or disaster typically may be declared in response to any natural or manmade event or occurrence that threatens the public's health or safety. The processes in many States or local governments for declaring a general emergency or state of disaster resemble those for declaring a public health emergency through MSEHPA. Thus, a figure with significant political accountability (e.g., Governor, State health commissioner, local mayor, county commissioner) is vested with responsibility for declaring an emergency under specific or more generalized standards, depending on the laws in the jurisdiction.[16]

DUAL DECLARATIONS. Community health planners must be prepared to respond to emergencies under a new legal framework consistent with a state of emergency, disaster, or public health emergency. Assessing responses can be complicated, however, particularly when jurisdictions issue conflicting declarations of emergency. For example, as occurred in Louisiana in responses to Hurricane Katrina in 2005, a State governor may declare a general state of emergency initially (because the standard for such a declaration is often broader) and declare a public health emergency later as specific facts unfold. Two major problems arise from dual declarations: (1) the flow of specific powers and protections from emergency declarations vary depending on the type of declaration, and (2) responsibility and authority for emergency responses may become convoluted when differing State or local agencies are legislatively assigned to coordinate responses.[17] In some States, public health authorities are responsible for managing a public health emergency while public safety or emergency management authorities handle general emergencies.[18] Although advance emergency planning at State and local levels may limit potential conflicts, murky issues of governmental responsibility and authority can cloud key decisions in allocating scarce resources.

FEDERAL DECLARATIONS. The Federal Government also has the power to declare an emergency or disaster. The President may declare a national emergency pursuant to the National Emergencies Act of 1976.[19] The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)[20] also grants presidential declarations of an emergency or major disaster and vests the President with various powers to coordinate and implement disaster response assistance measures. The President may authorize emergency assistance "to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States" at the request of a State governor or when the emergency is primarily a Federal responsibility.[21] Under the Stafford Act, depending on whether the event is an emergency or a major disaster, the Federal Government has differing powers to assist in response efforts.[22] For example, Federal disaster assistance is only available on the request of the State Governor for major disasters, including natural catastrophes, fires, floods, or explosions, "of such severity and magnitude that effective response is beyond the capabilities of the State and the affected local governments…."[23]

In addition, pursuant to the Public Health Service Act,[24] the HHS Secretary is authorized to declare a public health emergency.[25] This declaration authorizes a host of Federal actions. At any time, the Health and Human Services (HHS) Secretary may deploy members of the Public Health Service or intermittent disaster response personnel to assist in meeting surge capacity in health care facilities nationwide.

Balancing Individual and Communal Interests

An important theme in emergency responses for community health planners making critical decisions concerning allocations of scarce resources is the balance between individual and communal interests. Emergency laws can support these decisions, particularly when communal interests are at stake in public health emergencies. Other legal requirements, however, also may impact these decisions. Constitutional principles may limit how the government may allocate resources. For example, allocation decisions that (1) are based on unwarranted discrimination against protected classes (e.g., race, ethnicity, national origin, religion, sex), (2) lack any meaningful justification, or (3) deny individuals any opportunity to be heard may violate constitutional principles of equal protection and due process or corresponding civil rights statutes. Legal causes of action to stop the enforcement of these decisions may be brought even during emergencies.

Disability laws, such as the Americans with Disabilities Act (ADA)[26] or State or local equivalents, may require certain protections for persons with disabilities during emergencies. Some States and some localities bar discrimination under much broader "human rights" laws.[27] State and local governments legally may require the prioritization of their own workforce over the general population concerning specific medical interventions to ensure the stability of government and continued efforts to protect the public's health. Similar decisions by health care

entities to protect their essential personnel when resources are scarce also may be legally supportable.[28]

Federal or State agencies may prescribe specific laws or guidance concerning the prioritization of vulnerable populations in making decisions involving distribution of scarce resources. For example, during the 2004–2005 influenza season, flu vaccines ran short because of manufacturing problems with a major supplier. The Centers for Disease Control and Prevention (CDC) issued guidance concerning distributions of available vaccine that prioritize infants, the elderly, and pregnant women. Many States legally incorporated CDC guidance into their own State allocation decisions.[29] These types of legal actions prior to and during emergencies demonstrate how laws can facilitate allocation decisions (literally by dictating a specific outcome), but also how they may interfere with local decisions of community health planners (who may not agree always with lawmakers and policymakers concerning specific allocations).

Suspension of Existing Legal Requirements

One facet of declared states of emergency that is designed to facilitate response efforts is the ability of government to suspend specific legal requirements temporarily that would apply in nonemergencies otherwise. During a state of public health emergency pursuant to MSEHPA, for example, the governor may suspend the provisions of any regulatory statute prescribing procedures for conducting State business, or the orders, rules and regulations of any State agency, to the extent that strict compliance with the same would prevent, hinder, or delay necessary action (including emergency purchases) by the public health authority to respond to the public health emergency, or increase the health threat to the population.[30]

Similar statements allowing suspensions of existing provisions of law (except constitutional norms) exist in most Federal, State, and local emergency laws. Their use during an emergency can affect allocation decisions profoundly.

Interjurisdictional Legal Coordination

Emergencies tend to tax the existing capacities of governments and health care entities quickly in any locality, necessitating additional resources. Emergency responses require moving people and property between jurisdictions efficiently. Difficult legal questions arise. When can personnel or property be transferred between jurisdictions at the same or different levels of government during an emergency? Can States seize existing resources from counties or other municipalities? When must community health planners relinquish control or decisionmaking over specific resources? Does liability arise from the sharing of resources across boundaries?

These and other interjurisdictional legal concerns require coordination of activities and resources across local, State, and Federal boundaries before, during, and after emergencies. The Center for Law and the Public's Health has developed a Public Health Emergency Legal

Preparedness Checklist on Interjurisdictional Legal Coordination to help community health planners and others work through these issues.[31] As explained in the Checklist, interjurisdictional coordination may arise horizontally between similar jurisdictions (e.g., between adjacent counties) or vertically between different jurisdictions (e.g., between local and State, local and Federal, and State and Federal governments). Though complicated by contrasting Federal, State, and local laws, several legal tools may facilitate interjurisdictional exchanges of resources.

As noted in the sections above, emergency declarations may authorize interjurisdictional coordination efforts or suspend laws that may interfere with such coordination during the emergency. Formal mutual aid agreements between States (e.g., the Emergency Management Assistance Compact [EMAC[32]]), local governments (e.g., Illinois Public Health Mutual Aid System Agreement[33]), and foreign countries (e.g., International Emergency Management Assistance Compact between several New England States and Canadian provinces[34]) facilitate many exchanges of resources in real time during emergencies under specific conditions and protocols. Compacts like the Mid-America Alliance Mutual Assistance for Public Health Preparedness (among 10 Midwestern States)[35] authorize resource exchanges in exigent circumstances that do not require an emergency declaration.

Medical Licensure Reciprocity

Acquiring or exchanging property during emergencies to replenish dwindling supplies is one thing; the legality of acquiring additional medical personnel or others to meet patient surge capacity is another. During MCEs involving Federal or State declarations of emergency, the potential for significant losses of existing health care personnel coupled with hundreds or thousands of new patients presents an immediate need for additional trained health care providers.[36] These may come from other in-State facilities or through out-of-State places. During Hurricane Katrina, thousands of volunteer health personnel (VHPs) streamed to the affected Gulf Coast States to provide assistance.[37] Many of these volunteers came through coordinated governmental programs (e.g., State-based Emergency Systems for the Advance Registration of VHPs, local Medical Reserve Corps units) or private-sector efforts (e.g., American Red Cross, Salvation Army, hospital systems).[38] In addition, HHS hired certain VHPs as temporary, uncompensated employees.[39]

In nonemergencies, licensed non-Federal practitioners in one State cannot practice medicine or public health services in another State, absent applied waivers of State licensure requirements or other exceptional circumstances (e.g., Good Samaritan provisions). Federal health care providers need only to be licensed in one State to perform their official duties in any State.

During emergencies, States have created several legal approaches to circumvent normal licensing requirements for VHPs. Some States provide waivers of professional licensure requirements during declared emergencies. Licensure reciprocity also may be promulgated via

executive order or invoked pursuant to interstate agreements, such as EMAC.[40] These provisions allow volunteer health providers to practice for the duration of the emergency as if they were licensed in the jurisdiction, subject to restrictions on the scope of practice set forth by the State or political subdivision.

Though the paths to recognizing a VHP's out-of-State license are many, each is tied to specific legal interventions. For example, VHPs who are deployed via EMAC automatically qualify for licensure reciprocity. Others may have to rely on whether the host jurisdiction has invoked licensure reciprocity through emergency declarations or other legal routes. Medical practitioners with needed skills still may be rejected because their license to practice is conditional or nonactive (e.g., the practitioner may be retired from medical practice) or they fail to meet emergency credentialing or privileging standards. Licensure reciprocity provisions must be clearly communicated during emergencies to ensure that VHPs are available to participate in emergency response efforts.

Beyond VHPs, patient family members, neighbors, or others within the community may be needed to provide palliative or other medical care or offer essential support for medical personnel. While a State-based declaration of an emergency typically does not authorize nonmedically trained individuals to engage in systematic medical care of patients, their supervised participation in the care of relatives or companions is essential. Just as in nonemergencies, such activities are legally warranted in many cases. Persons lacking medical training also may provide key support services in the delivery of medical care to patients without legal impediments, provided that they do not actually treat patients. Screening patients through the administration of basic services by nonmedical personnel is legally permissible during emergencies; diagnosing patients, deciding their treatment, or prescribing their medications is not, pursuant to a host of Federal, State, and local laws.

Liability and Other Protections for Health Care Workers and Volunteers

One of the premier concerns of health care workers and VHPs, as well as the health care entities that host them, is their risk for civil liability for negligent or intentional actions that may result in harm to patients during emergencies. The uncertainties of emergency environments, the need to work within standards appropriate to the situation,[41] and the unpredictability of harms to some patients (especially during emergencies) raise liability fears. Still, there may be some liability protections for these actors depending on the circumstances. Immunity from civil liability for harms to patients may be available through multiple legal sources, including (1) governmental sovereign immunity (if the worker or volunteer is a government employee or agent),[42] (2) Federal and State volunteer protection acts,[43] (3) Good Samaritan statutes,[44] (4) State emergency health powers statutes, and (5) mutual aid compacts such as EMAC.[45] For example, State officers or employees providing aid via EMAC during emergencies are protected

from civil liability as agents of the requesting State so long as they act in good faith and without "willful misconduct, gross negligence, or recklessness."[46]

Despite significant protections for individual actors, fewer liability protections exist for the entities (e.g., private hospitals, medical clinics) that respond to emergencies. The Federal Volunteer Protection Act of 1997, for example, provides immunity for volunteers of nonprofit entities but not for the entities themselves.[59] Other State laws mimic this approach. As a result, hospitals and other health care entities are open to more potential liability for their acts (or failures to act) during an emergency.[47] An emerging State model law (e.g., the Uniform Emergency Volunteer Healthcare Services Act) provides some liability protections for entities coordinating or hosting VHPs.[48]

A different type of harm for which liability may arise involves the workers or volunteers themselves. Under what circumstances may government or the private sector compensate these individuals for the injuries (e.g., physical or mental) incurred in responding to the emergency? In the employment context, workers are often protected from these harms through worker's compensation programs that cover individuals injured or killed at work.[49] The cause or fault of the employee is not a factor; worker's compensation pays regardless. These benefits typically cover public- and private-sector employees during emergencies, but what about VHPs? Volunteers are not typically viewed as employees and thus do not benefit automatically from worker's compensation coverage.

There are legal solutions to this dilemma. For example, volunteers deployed as Federal or State agents may be covered by governmental workers compensation plans. VHPs deployed through EMAC are automatically eligible for State workers compensation benefits. Some States, like Michigan, have legally extended their workers compensation programs to registered VHPs providing services in the State during an emergency.[50] Some employers as well have worked out contractual agreements with their workers' compensation carriers to continue to cover employees who volunteer to respond to an emergency outside the employment setting.

Property Management and Control

At the core of resource allocation issues involving nonpersonnel is the need to manage and control public and private property. This includes real property (e.g., land, buildings, establishments) and personal property (e.g., medical supplies, drugs, beds).

As part of their day-to-day legal power to abate public health nuisances, public health authorities are able to condemn, remove, or destroy any property (public or private) that may harm the public's health.[51] For example, if a private office building is contaminated with anthrax spores (as happened in Florida in fall 2001), State or local governments may require the facility to be shut down until it is safe for human occupancy. Of course, the power to abate public nuisances exists during emergencies as well.

Uses of real or personal property by State or local government or the private sector during emergencies depend on the type of emergency declared. Some common legal premises, however, permeate most declared states of emergency. Emergency management officials or public health authorities may designate public property instantly (e.g., State or local government buildings) for emergency uses and require an inventory and reallocation of available supplies. State or local governmental authorities are also empowered to seize private property for public use that is reasonable and necessary to respond to the emergency. This includes the ability to use and take temporary control of certain private-sector businesses and activities that are of critical importance to emergency responses.

During a public health emergency pursuant to MSEHPA, for example, a State department of health may designate a private facility (e.g., hotel, convention hall, private meeting place) to serve as a clinic for vaccination or other public health services. Similarly, health care facilities may be governmentally controlled to treat patients, although governments typically seek to partner with (and not commandeer) such facilities. Privately held medical supplies may be acquired quickly via the government to meet its own needs or the needs of the population.[52]

Whenever governmental authorities take private property to use for public health purposes, constitutional law requires that the property owner be provided just compensation.[53] That is, the government must compensate the owner of any facilities or materials temporarily or permanently procured for public use during an emergency. Most emergency laws require payment not instantaneously but rather at some point after the state of emergency has rescinded. When public health authorities must condemn and destroy any private property that poses a danger to the public, however, no compensation to the property owners is constitutionally required.

Other permissible property control measures include restricting certain commercial transactions and practices such as price gouging to address problems arising from the scarcity of resources. MSEHPA specifically allows public health officials to regulate the distribution of scarce health care supplies and control the price of critical items during an emergency.[54] In addition, public health authorities may seek the assistance of health care providers to perform medical examination and testing services. Maryland emergency laws actually compel health care workers to provide medical services (although this legal approach is not common).[55]

These legal interventions can be a double-edged sword for community health planners. Laws may help community health planners meet critical resource needs by making available essential supplies or personnel or prohibiting price gouging but also may require planners to share their own resources in the interests of protecting the public's health. Standards for making critical choices in allocating scarce resources will help community health planners and their Federal, State, or other partners make guided decisions that work to the benefit of the community.

Making Allocation Decisions in Real Time: Legal Triage

Laws can help (and hinder) community health planners' decisions concerning the allocation of scarce resources. A key question is how to use the law as a positive tool during an emergency. One of the fundamental observations discussed in this chapter is the extent to which the legal landscape changes during emergencies. Normal processes, rules, and regulations may not apply fully. Expedited uses of public health or other governmental powers coincide with community health planners' need to make decisions in real time. Assessing the legality of specific choices (even when protections or requirements are neatly spelled out in emergency law) is difficult when the legal environment itself is changing.[56] The potential for some planners to act without significant regard for the legal ramifications or, conversely, to fail to act because of their legal apprehension sustains the need for advance consideration of the legal consequences.

Community health planners must align with their local legal community to clarify emergency legal issues in their jurisdictions. Addressing legal issues that underlie the allocation of scarce resources is an essential part of emergency plans. Begin with a series of legal questions that have been uniformly answered in prior emergencies. Does local government have sufficient home rule to declare an emergency? If so, under what authority? What types of emergencies can be declared? What powers flow from the declaration? What nonemergency legal provisions may be suspended? Additional questions may be derived from the checklist, *Local Government Public Health Emergency Legal Preparedness and Response*, developed by the Center for Law and the Public's Health.[57]

CHECKLIST FOR PLANNERS

A useful checklist on local government public health emergency legal preparedness and response is available at **http://www.publichealthlaw.net/Resources/BTlaw.htm.**

Tougher questions should be specified and addressed. What emergency provisions directly impact the allocation of scarce resources? Who is legally responsible for making critical decisions at the State or local level? How much authority will a particular entity be given to make critical choices? When can the government challenge that entity's decisions? When is that entity, its employees, or its volunteers legally accountable for these decisions?

Advance planning and issue identification are essential, but they alone are not enough. Just as medical personnel must triage patients according to need during emergencies, legal practitioners in the public and private sectors must be prepared to prioritize relevant legal issues in real time. *Legal triage* refers to the efforts of legal actors to construct a favorable legal environment during emergencies through a prioritization of issues and solutions that facilitate legitimate public health responses and allocation decisions.[58]

Community health planners should partner with members of the local legal community who are prepared during emergencies to (1) identify legal issues that may facilitate or impede allocation decisions as they arise; (2) monitor changing legal norms during emergencies; (3) communicate with lawmakers and policy officials in government and the private sector; (4) develop innovative, responsive legal solutions to reported barriers to allocation decisions; (5) explain legal conclusions through tailored communications to planners and affected persons; and (6) revisit consistently the utility and efficacy of legal guidance related to allocation decisions. Only through the skilled, knowledgeable, and coordinated efforts of legal practitioners and community health planners via legal triage during emergencies can some allocation decisions be made with legal confidence.

Endnotes

[2] Hodge JG Jr. Bioterrorism law and policy: critical choices in public health. *Journal of Law, Medicine, & Ethics*. 2002;30:254-255.
[3] Center for Law and the Public's Health. Model State Emergency Health Powers Act (MSEHPA) art. V-VI 2001. Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf. Accessed April 15, 2006.
[4] Center for Law and the Public's Health, Health Resources and Services Agency. Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) – Legal and Regulatory Issues. 2006:23.
[5] Ibid. 2006:25-26.
[6] University of Maryland Center for Health and Homeland Security. *Maryland Public Health Emergency Preparedness Legal Handbook*. 2005:31.
[7] Hodge JG Jr. Legal triage during public health emergencies and disasters. *Administrative Law Review*. In press.
[8] Center for Law and the Public's Health. Model State Emergency Health Powers Act (MSEHPA) art. V-VI (2001). Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf. Accessed April 15, 2006.
[9] Gostin LO, Sapsin JW, Teret SP, Burris S, Mair JS, Hodge JG Jr., Vernick JS. The Model State Emergency Health Powers Act: planning for and response to bioterrorism and naturally occurring infectious diseases. *JAMA*. 2002;288:622.
[10] As of July 15, 2006, MSEHPA has been introduced in whole or part through bills or resolutions in 44 States, the District of Columbia, and the Northern Mariana Islands. Thirty-eight (38) States and the District of Columbia have passed bills or resolutions that include provisions from or closely related to the Act. For more information, see Center for Law and the Public's Health. *MSEHPA State Legislative Activity Table*. July 15, 2006. Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA%20Leg%20Activity.pdf. Accessed November 27, 2006. Center for Law and the Public's Health. *MSEHPA Legislative Surveillance Table,* July 15, 2006. Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA%20Surveillance.pdf. Accessed November 27, 2006.
[11] Center for Law and the Public's Health. *Model State Emergency Health Powers Act (MSEHPA).* § 104(m). Proposed Draft for Discussion 2001. Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf. Accessed April 15, 2006. Italicized language indicates optional language for consideration by States.
[12] Gostin LO, Sapsin JW, Teret SP, Burris S, Mair JS, Hodge JG Jr, Vernick JS. The Model State Emergency Health Powers Act: planning for and response to bioterrorism and naturally occurring infectious diseases. *JAMA*. 2002;288:622.
[13] Center for Law and the Public's Health. *Model State Emergency Health Powers Act.* § 608 (2001). Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf. Accessed April 15, 2006.
[14] Ibid. § 804 (2001).
[15] Ibid. §§ 505-507 (2001).
[16] Hodge JG Jr, Gable LA, Calves S. The legal framework for meeting surge capacity through the use of volunteer health professionals during public health emergencies and other disasters. *Journal of Contemporary Health Law and Policy*. 2006;22:5-71.
[17] Ibid.
[18] Hodge JG Jr. *Delaware Public Health Emergency Law - Review, Recommendations, and a Blueprint for Reform.* Dover, DE: Delaware Department of Health and Social Services; 2004;1-62.
[19] 50 U.S.C. §§ 1601(b) (2006).
[20] The Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-5206 (2002).

[21] Ibid. §§ 5122(1), 5191 (2002).
[22] Ibid. §§ 5120-5206 (2002).
[23] Ibid. §§ 5170, 5191 (2002) (requiring that, prior to requesting Federal assistance from the President, the State Governor must utilize State resources to respond to the emergency, including the activation of the State emergency management plan).
[24] Public Health Service Act, 42 U.S.C. § 201 et seq. (2006).
[25] Public Health Security and Bioterrorism Preparedness and Response Act of 2002, 42 U.S.C. § 247d. 2003.
[26] The Americans with Disabilities Act of 1990. Pub. L. No. 101-336.
[27] The New York "Human Rights Law," New York Executive Law Art. 15 §290 et seq.
[28] Hodge JG Jr. Bioterrorism law and policy: critical choices in public health. *Journal of Law, Medicine & Ethics.* 2002;30:254-255.
[29] Hodge JG Jr, O'Connell J. The legal environment underlying influenza vaccine allocation and distribution strategies. *Journal of Public Health Management and Practice.* 2006;12(4):340-348.
[30] Center for Law and the Public's Health. Model State Emergency Health Powers Act § 403(a)(1) (2001). Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf. Accessed April 15, 2006.
[31] Center for Law and the Public's Health. Public health emergency legal preparedness checklist on interjurisdictional legal coordination. 2004. Available at: http://www.publichealthlaw.net/Resources/BTlaw.htm. Accessed November 27, 2006.
[32] Emergency Management Assistance Compact (EMAC), Pub. L. No. 104-321.
[33] Intergovernmental Mutual Aid Agreement for the establishment of the Illinois Public Health Mutual Aid System. Available at: http://www.idph.state.il.us/local/mutualaidagree_9.30.04.pdf. Accessed November 27, 2006.
[34] Fox P. Cross-border assistance in emergencies: the New England/eastern Canadian model. *New England Journal of International Contemporary Law*. 2004;11:75.
[35] Mid-America Alliance: Mutual Assistance for Public Health Preparedness (2005). Available at: http://app1.unmc.edu/midameria. Accessed November 27, 2006.
[36] Hodge JG Jr. Legal issues concerning volunteer health professionals and the hurricane-related emergencies in the Gulf Coast region. *Public Health Report*. 2006;121:205-207.
[37] The White House. The Federal Response to Hurricane Katrina: Lessons Learned. 2006:58. Available at: http://www.whitehouse.gov/reports/katrina-lessons-learned/ 2006:58. Accessed November 27, 2006.
[38] Hodge JG Jr. Legal issues concerning volunteer health professionals and the hurricane-related emergencies in the Gulf Coast region. *Public Health Report*. 2006;121:205-207.
[39] Ibid.
[40] Emergency Management Assistance Compact (EMAC), Pub. L. No. 104-321, art. V, 100 Stat. 3877, 3880. 1996.
[41] Agency for Healthcare Research and Quality. Altered Standards of Care in Mass Casualty Events., AHRQ Publication No. 05-0043. April 2005. Available at: http://www.ahrq.gov/research/altstand/. Accessed November 27, 2007.
[42] 42 U.S.C. § 5148 (2000).
[43] Federal Volunteer Protection Act of 1997. Pub. L. No. 105-19, § 4, 111 Stat. 218, 219 (1997), 42 U.S.C. § 14503 (2000); Ala. Code. § 6-5-336(d)(1) (LexisNexis 2005); Miss. Code Ann. § 95-9-1(3) (LexisNexis 1972).
[44] Massachusetts General Laws Annals. ch. 112, § 12B, ch. 111C, § 20 (West 2003).
[45] Emergency Management Assistance Compact (EMAC), Pub. L. No. 104-321.
[46] Emergency Management Assistance Compact (EMAC), Pub. L. No. 104-321, art. VI, 100 Stat. at 3880.
[47] Hodge JG Jr, Calves S, Gable LA, Meltzer E, Kraner S. Risk management in the wake of hurricanes and other disasters: Hospital civil liability arising from the use of volunteer health professionals during emergencies. *Michigan State University Journal of Medicine and Law*. In press.
[48] The Uniform Emergency Healthcare Services Act § 7(c). In press.
[49] Hodge JG Jr. The intersection of Federal health information privacy and State administrative law: the protection of individual health data and worker's compensation. *Administrative Law Review*. 1999;51:117-144.
[50] M.C.L. §§ 418.161(g), 30.411 Sec. 11(1)(b)-(c).
[51] Gostin LO. *Public Health Law: Power, Duty, Restraint*. Berkeley: University of California Press; 2002:263-265.
[52] Gostin, LO, Hodge JG Jr. The Model State Emergency Health Powers Act – A Brief Commentary. Seattle: Turning Point Statute Modernization Collaborative, 2002; 1-42. Available at: http://www.publichealthlaw.net/Resources/Modellaws.htm#MSEHPA. Accessed November 27, 2006.
[53] Gostin LO. *Public Health Law: Power, Duty, Restraint*. Berkeley: University of California Press; 2002:265.
[54] Center for Law and the Public's Health. Model State Emergency Health Powers Act §§ 505-507 (2001), Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf. Accessed April 15, 2006.

[55] Md. Code Ann., Public Safety §§ 14-3A-03(c), 14-3A-08 (Supp. 2004).
[56] Hodge JG Jr. Legal triage during public health emergencies and disasters. *Administrative Law Review.* In press.
[57] Center for Law and the Public's Health. Checklist on local government public health emergency legal preparedness and response. Available at: http://www.publichealthlaw.net/Resources/BTlaw.htm. Accessed November 27, 2006.
[58] Hodge JG Jr. Legal triage during public health emergencies and disasters. *Administrative Law Review.* In press.

Chapter IV. Prehospital Care

AUTHORS

Edward Gabriel, M.P.A., AEMT-P, Lead Author, Director of Crisis Management, Walt Disney Corporation

Peter Pons, M.D., Professor of Emergency Medicine, Department of Surgery, University of Colorado Health Sciences Center

George Foltin, M.D., Associate Professor of Pediatrics and Emergency Medicine, Bellevue Hospital

Richard Serino, EMT-P, Chief, Boston Emergency Medical Services

Paul Maniscalco, M.P.A., EMT-P, Assistant Professor, Homeland Security Policy Institute, George Washington University

This chapter discusses the unique context in which the U.S. emergency medical services (EMS) systems operate, and the issues that will need to be addressed in the case of a mass casualty event (MCE). It presents the challenges to planning and coordination posed by the fragmented nature of EMS training, guidelines, and response capacity and offers recommendations for allocating scarce resources to respond to a catastrophic MCE. It highlights specific issues that planners need to consider to maximize EMS response capacity, offers recommendations for successful EMS MCE planning, and presents ideas and resources for EMS planners based on real-case scenarios and planning efforts.

Prehospital Care Issues and Recommendations At A Glance

MAJOR CHALLENGES AFFECTING EMS MCE PLANNING

Lack of:

- Consistency in EMS training and credentialing
- Coordination and communication among EMS services and with public safety, public health, hospitals, trauma centers, and 9-1-1 dispatchers
- Readiness preparedness among EMS providers and systems
- Disaster training in EMS curricula
- Financial and staff resources
- An evidence base for EMS care

RECOMMENDATIONS FOR EMS PLANNERS

- Develop partnerships with Federal, State, and local stakeholders to clarify roles, resources, and responses to potential MCEs.
- Improve communication and coordination strategies and backup plans.
- Exercise, evaluate, modify, and refine MCE plans.
- Model EMS responses to MCEs.
- Develop public education plans to provide information on when and where to obtain care.
- Ensure a cadre of EMS leaders.
- Plan and implement strategies to maximize to the extent possible:
  - Use and availability of EMS personnel
  - Transport capacity
  - Role of dispatch and public safety answering points (facilities that receive 9-1-1 calls)
  - Personal protection for EMS personnel
  - Patient triage and evaluation
  - Destination choices.
- Use natural opportunities to exercise disaster planning.
- Use existing case examples and best practices.
- Develop strategies to identify large numbers of young children who may be separated from parents and cannot give information that would help them to be reunited with their parents.

Context of EMS Systems and Challenges for MCE Planning

In the event of a catastrophic MCE, it is the EMS systems that will be called on to provide first-responder rescue, assessment, care, and transportation and access to the emergency medical health care delivery system. Emergency medical services in the United States are provided through a complex system composed of highly variable organizational structures. Nearly half of

all EMS are delivered through local fire departments. Others are structured within municipal or county governments, police departments, health departments, or private companies (e.g., hospital-based, for-profit ambulance services) or are volunteer-based.[59]

The variability of EMS response systems is further exacerbated by important differences in EMS preparedness training, guidelines, and response capacity – posing significant coordination and communications challenges for EMS leaders and planners. Two recent reports from the Institute of Medicine (IOM), *Emergency Medical Services: At the Crossroads* and *Hospital-based Emergency Care: At the Breaking Point*,[60,61] highlight constraints and challenges that will impede the capacity of the nationwide EMS systems to respond to a catastrophic MCE. They include the following:

LACK OF CONSISTENCY. A criticism of the existing state of EMS preparedness is that there is no single oversight agency responsible for ensuring consistency in training, certification, or guidelines for disaster response, the use of personal protective equipment (PPE), or the coordination of EMS response and operations. There is wide variation in the design of EMS systems across States and local areas. Similarly, there is no coherent compliance program to ensure that EMS preparedness initiatives are integrated, sustainable, and exercised regularly to test for efficacies and vulnerabilities. In their recent report cited above, the IOM recommends that all institutions responsible for the training, continuing education, and credentialing and certification of professionals involved in emergency care (including medicine, nursing, EMS, allied health, public health, and hospital administration) incorporate disaster preparedness training into their curricula.

LACK OF COORDINATION. No central command and control entity coordinates assets and ensures communication among EMS response systems. Often EMS agencies are unable to communicate with each other because of incompatibilities in their communication systems. There is also a lack of communication and coordination among prehospital EMS and 9-1-1 dispatchers, public safety agencies, public health, air medical providers, hospital centers, and trauma centers – especially when emergencies cross jurisdictional lines.

LACK OF READINESS PREPAREDNESS. EMS representation in disaster planning at the Federal level has been limited, according to the IOM report. In addition, most EMS systems are not trained in the National Response Plan. Thus, they have little or inconsistent knowledge with its incident command and its tenets for supporting operational requirements. Likewise, EMS systems may not be fully aware of the Federal response capability, such as the provisions of the Homeland Security Presidential Directive/HSPD-5, the National Disaster Medical System (NDMS), use of Disaster Medical Assistance Teams, the Incident Command System, Occupational Safety and Health Administration (OSHA) PPE guidelines, and OSHA Hazard Materials Operations regulations. As a result, there is risk that requests for resource augmentation will be misdirected

– possibly overlooking potential sources of support, command and control, communications, and interoperability from other Federal departments and agencies.

EXAMPLES OF FEDERAL RESPONSE RESOURCES

Homeland Security Presidential Directive HSPD-5:

http://www.whitehouse.gov/news/releases/2003/02/20030228-9.html

NDMS: **http://www.ndms.fema.gov**

Disaster Medical Assistance Teams: **http://oep-ndms.dhhs.gov/dmat.html**

OSHA PPE Guidelines: **http://www.osha.gov/SLTC/personalprotectiveequipment/index.html**

OSHA Hazard Materials Operations Regulations:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10099

LACK OF STANDARDIZED DISASTER TRAINING IN EMS CURRICULA. At this time there is no standardized requirement for education (and continuing education) regarding disaster training, special incident, or catastrophic response, and thus most EMS personnel have not been consistently trained to respond to acts of terrorism, natural disasters, or other potential MCEs. As a result, EMS responders will be called to situations in which they may be overwhelmed and unprotected. Some of these issues are being addressed by the Federal Interagency Committee on EMS, which was created to provide the EMS community with a mechanism for ongoing Federal coordination of EMS programs. The Committee and its supporting Federal agencies are focused on the development of National EMS Education Standards.

DEVELOPING A NATIONAL MODEL FOR EMS TRAINING

To address the lack of consistency in EMS training and credentialing, the National Highway Traffic Safety Administration (NHTSA) has been developing a national model to aid States in adopting a common scope of practice for EMS personnel, with State licensing reciprocity. Together with the Health Resources and Services Administration and other Federal Agencies, NHTSA is focused on the development of National EMS education standards and on providing leadership and coordination of comprehensive, evidence-based emergency medical services and 9-1-1 systems. More information is available at **http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.2a0771e91315babbbf30811060008a0c/**.

LACK OF FINANCIAL RESOURCES. Many EMS response agencies do not have the financial resources to extend themselves beyond the demands of daily operations. Large-scale disasters often require unique resources and response capabilities, which are outside the scope of normal operations and far exceed agency budgets.

LACK OF STAFF. EMS response organizations are confronted with a severe recruitment and retention problem nationwide. EMS systems often are not attributed the same professional regard as other health professionals, and their salaries are often lower than those of police officers, fire fighters, and nurses. Many prehospital providers also hold other jobs; for example, volunteer emergency medical technicians (EMTs) in most communities have other employment, and their availability during an MCE may be limited. In addition, many personnel have more than one EMS employer or other obligations such as participation in the NDMS or military service.

LACK OF AN EMS EVIDENCE BASE. Research on prehospital care and response is limited, raising concerns that some practices may be inappropriate (e.g., field intubation of children) and clinical care questions remain unanswered. These challenges make it difficult for EMS response agencies to ensure a uniform culture of preparedness. As a result, there is an increased risk that without careful and concerted pre-event planning, the response to an MCE will be disjointed and less effective than it could be and will lead to avoidable deaths or injuries of both affected civilians and EMS responders themselves.

EMS in an MCE: Expected Shortages and Needs

In the case of an MCE, many health care resources at the local and regional levels will be overwhelmed or eliminated. Those EMS response agencies that are able to remain operational likely will encounter a demand for services that will outstrip the supply and available resources. EMS systems will confront:

- Personnel shortages.
- Breakdowns in supply chains.
- Lack of coordination and information sharing among diverse EMS providers, public safety, hospitals, trauma center, and public health.
- Breakdown of logistic support for operational sustainability, including such things as fuel shortages; inadequate availability of transport vehicles; and shortages in supplies, equipment, and pharmaceuticals.
- Overloading of hospital emergency departments and associated services such as intensive care capabilities; specialty services such as burn care or decontamination units; and specialized equipment such as ventilators, PPE, or negative pressure rooms.
- Breakdowns in local “burden sharing” strategies (mutual aid agreements) due to overwhelming demand and lack of surge capacity.
- The need to implement modified treatment protocols to meet the extraordinary conditions of the MCE that may be limited to reasonable life-sustaining activities where appropriate.

Recommendations for planners

There are several important actions that planners should take *prior to an MCE* to help maximize the response capacity of prehospital EMS services. Those actions include the following:

FORGING PARTNERSHIPS AT ALL LEVELS. Building relationships and partnerships is a critical component of emergency management planning. The need to coordinate and allocate scarce prehospital resources in the case of a catastrophic MCE requires the development, implementation, exercising, and refinement of partnerships between Federal, State, and local government response agencies, as well as between public and private entities. These relationships need to clearly define the roles, responsibilities, capabilities, oversight, command, communications, logistics, and response resources each will bring to bear in an MCE. *Involvement of senior leadership from all response agencies is essential for success and actual progress.*

> "Emergency management is really about building relationships, whether you are in the public or private sector. And in building those relationships, it is important to remember not to *tell*, but to *talk*."
>
> Edward Gabriel
> Walt Disney Corporation

Examples of partnerships could include the establishment of mutual aid agreements or interstate compacts to address issues such as the acquisition and deployment of extra transport vehicles or licensure and indemnification matters regarding responders. Similarly, memoranda of understanding (MOUs) could be developed among public and private ambulance services to coordinate response to potential MCEs.

MEMORANDA OF UNDERSTANDING (MOUS)

Further information on developing MOUs is available from the Center for Law and the Public's Health at **http://www.publichealthlaw.net/Research/Katrina.htm.** Click on Memo 3.

IMPROVING COMMUNICATION AND COORDINATION. Planners must develop integrated and interoperable communications and data systems that can link EMS agencies to hospitals, trauma centers, public safety departments, emergency management offices, and public health agencies. Communication discipline is one of the keys to effective incident management, and ideally, these systems would be centralized through established Incident Command System (ICS) channels. There also should be a plan for backup or redundant communication strategies in case there are failures in primary communication methods. Similarly, other backup procedures for

actions that can be taken when systems fail should be planned, tested in advance, and integrated into the planning process.

CONTINUALLY MODIFYING AND REFINING PLANS. Practical planning is essential and should include concrete implementation steps with training and exercise goals for each step. Each component of the response should be taught, exercised to the point of failure, evaluated, modified, rewritten, and tested once again. Exercises should simulate actual casualties, as well as management of the "worried well" – individuals calling for EMS resources who actually do not need them. Exercises should include response partners from public, private, community, and governmental agencies. This iterative process allows for continuous modifications and improvements.

MODELING MCE RESPONSES. Modeling responses to a catastrophic MCE may take the form of tabletop exercises, actual but smaller events, or computer simulations and can provide examples of difficulties which may be faced during such an event. Such modeling efforts should start using small numbers of casualties as a starting point and then use rising victim number scalability models; i.e., plan for 100, then 1,000, then 10,000, and then 100,000. Planners should consider the use of models such as the Large Scale Emergency Response (LASER) Program at New York University (NYU), which includes the following components: computer modeling of large-scale events, risk communication, legal aspects, workforce support, and community-based response issues.

MODELING LARGE-SCALE DISASTER SCENARIOS

The LASER program at NYU uses a computer model of New York City to simulate possible catastrophic disasters according to a range of prescribed parameters. It can simulate the National Incident Management System and assess its integration at the local level to test in detail the effectiveness of various emergency response strategies. It also highlights factors such as communications strategies for providing risk and emergency information to the public that could decrease fatalities. Further information is available at **http://www.nyu.edu/ccpr/projects/laser.html.**

EDUCATING THE PUBLIC. Planners need to develop, implement, exercise, and refine efforts to provide for comprehensive public education. This may include such things as scripted messages that provide specific directions to the public on actions they should take or public information programs that specifically outline whether to call 9-1-1 for assistance.

PROVIDING AND ENSURING LEADERSHIP. Leadership training should be provided for mid- and upper-level EMS supervisory staff members to ensure that in case of major illness, injuries, or deaths, there will be individuals who can take on the role of EMS medical director or leadership. The determination also should be made in advance regarding who in the

organization would be able to adjust standard operating procedures and the scope of practice of EMTs to the needs of the situation.

Case Study: Preparation for the 2004 Democratic National Convention in Boston, MA

For more than a year before the 2004 Democratic National Convention, Massachusetts's public health agencies planned and drilled for a variety of potential emergency and disaster scenarios. Following are examples of the key preparatory steps they took.

- EMS agencies and organizations in the Boston area developed a mapping database with current information on emergency exits, emergency medicine locations, and routes to hospitals and clinics to be used in GIS mapping systems and for planning purposes.
- The Massachusetts Emergency Management Team (MEMT), composed of liaisons from more than 70 agencies and organizations, met and trained together on a monthly basis. The MEMT served as the coordinating agency for the State Emergency Operations Center (SEOC). More than 30 Federal, State, local, private, and volunteer agencies and organizations staff the SEOC on a 24/7 basis.
- The MEMT prepared and tested a plan for integrating business and industry into the emergency support function. Designated liaisons from area businesses and industries helped the MEMT prepare to use their assets and expertise and to communicate with business and industry leaders.
- A Consequence Management Subcommittee met to develop response and coordination plans for the various EMS organizations. The subcommittee considered how information should be collected and shared among the large number of command and/or operations centers and explored ways to connect these centers to Washington and all the other command and/or operations centers.

Approaches to the allocation of scarce resources

In the face of a catastrophic MCE, there likely will be scarcities and mismatches regarding EMS personnel, transport capacity, and destination availabilities for patient treatment. As a result, creative strategies will need to be implemented for coordinating and maximizing the use of available staff members and resources. Ideally, these strategies should be considered, tested, and refined prior to the MCE. Legal and ethical advisors should be included in discussions (see Chapters II and III of this guide). Approaches to the allocation of scarce resources to be considered should include, but not be limited to, the following:

MAXIMIZE THE AVAILABILITY OF EMS PERSONNEL through modified or extended shifts, deployment of no more than two providers per vehicle, and use of one-person response vehicles for "patient evaluation" prior to dispatch of transport resources. Staff members also may be shifted so that non-EMT personnel serve as drivers; fire, police, or volunteer EMT personnel provide assistance during transport; and other medical personnel (e.g., physicians, nurses, nurse's aides) help staff casualty treatment sites to permit EMS personnel to provide transport services. "Just-

in-time" programs to train nonmedical volunteers to provide basic medical care such as direct pressure for hemorrhage control also should be developed.

MAXIMIZE THE USE OF AVAILABLE EMS PERSONNEL. Some medical protocols may be suspended (e.g., base contact for certain interventions) to allow for greater efficiency and flexibility in patient management. EMS personnel may be used in nontraditional settings (e.g., alternative care sites, hospitals, pharmaceutical distribution centers) for field triage, treatment, or transport. Their scope of practice may be extended to provide vaccinations or medications or to deliver nontraditional medical care at the scene or in the home.

MAXIMIZE TRANSPORT CAPABILITY. Public and private ambulance services should be coordinated and steps taken to ensure that they do not self-dispatch to MCEs. Paramedic-initiated alternative transport mechanisms also should be put into place (e.g., buses, taxis, privately owned vehicles). Mutual aid agreements should be in place and implemented to deploy and use available transportation assets, staff members, and staging locations. Transport assets should be loaded to their full capacity and patients taken to the closest appropriate hospital or care site. Air transport should be used to take patients to distant facilities (unless the incident presents contamination risks). Noncritical calls should be batched by geographic area. Bypass, diversion, or closure rules could be suspended to promote equitable distribution of patients and to try to avoid the overloading of any one hospital. Secondary transport needs should be anticipated so that patients can be transferred from overloaded hospitals or care sites to those that are less affected.

COMMUNITY EMERGENCY RESPONSE TEAMS (CERTS)

The CERTs program educates people on disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. Using the training learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members also are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community. Further information is available at **http://www.citizencorps.gov/cert/about.shtm.**

MAXIMIZE THE ROLE OF PUBLIC SAFETY ANSWERING POINTS AND DISPATCH. Call screening strategies should be in place to determine the level of urgency required to respond to calls. Maximal response strategies involving multiple responders (e.g., engine company, ambulance, law enforcement) used in standard EMS response should be avoided.

Prearrival instructions should be scripted and tailored to the incident at hand with formal recommendations regarding the use of alternative methods of transport and alternative care

sites. Nontransporting vehicles with a single responder may be dispatched to evaluate calls and the need for onsite care and ambulance transport.

MAXIMIZE PERSONAL PROTECTION FOR PERSONNEL. Universal precautions should be used for every patient encounter, if at all possible. To minimize the number of responders exposed to pathogens or chemicals, specialized protections should be used to the extent possible and adjusted to the nature of the incident (e.g., distribution of antibiotics, vaccines, or antidotes to staff and family members). In the case of chemical incidents, decontamination needs must be evaluated and addressed prior to transportation to preserve transport capability. Similarly, security personnel should be assigned to protect EMS response operations, logistics centers, and stockpile depots.

MAXIMIZE PATIENT TRIAGE AND EVALUATION. Specific triage systems should be in place prior to an incident, and personnel should be trained and exercised in their use. Examples of triage systems include the START and JUMPSTART triage systems.

START/JUMPSTART

A combined **START/JUMPSTART triage algorithm** for patients from birth to age 14 years is available at **miemss.umaryland.edu/emscwww/pdfs/startjumpstartq.pdf.**

Simple triage methods include rapid separation of the critical from the noncritical (i.e., "Everyone who can walk should get on this bus"). The overarching principle for triage is "the most good for the most people." The differentiation of "expectant" patients from those who likely will survive should be performed in consultation with or by the EMS Medical Director or designee. Selected triage systems should include palliative treatment for casualties deemed to have little likelihood of survival. Although such patients may be categorized as lower priority for transport, appropriate comfort measures, including pharmacologic treatment, should be provided as available.

NATIONAL FIELD TRIAGE CRITERIA

The Terrorism Injuries: Information, Dissemination and Exchange (TIIDE) Project convened a meeting in 2005 to begin to develop national field triage criteria that can be used in mass casualty events. The TIIDE grantees consist of six emergency medicine organizations who are leading an effort to review the available evidence on mass casualty triage and develop a position paper on the subject that will be endorsed by the TIIDE partner organizations. Planners can find further information about the TIIDE Project at **http://www.acep.org/webportal/membercenter/sections/ems/cdcmodelcommunities.htm.**

MAXIMIZE DESTINATION CHOICES. A centralized coordination of patient transport should be in place to minimize hospital overloading and maximize the use of other available resources, such as primary care providers, alternative care sites, medical evaluation centers, or triage centers.

Indeed, it is likely that the vast majority of victims of an MCE may end up being most appropriately managed in the home setting, either because their illness or injury is not severe enough to warrant institutionalized care or because the successful outcome of such inpatient treatment in the setting of scarce and limited resources would be considered futile and potentially wasteful.

Many view the community hospital as a "safe haven," a place to go for food, shelter, protection, and medical attention. However, particularly in the event of a transmissible infectious disease in which hospitalized patients represent the sickest patients in the community, the concept of "safe haven" may not be applicable. In fact, it may be more dangerous to be in the hospital setting than to remain at home. It is important for community planners to highlight the concept of the home as a "safe haven" in their risk communication strategies and develop measures to support this concept. Emergency planners, therefore, must incorporate the likelihood of home care delivery in all aspects of their planning efforts. This planning must focus on the possibility that some rudimentary degree of medical care will need to be delivered in the home setting, often with limited outside professional assistance.

Incorporating Home Care Into Emergency Planning: Issues to Consider

- Register patients being cared for in the home setting with a local emergency management agency and the public health department to ensure access to relevant information.
- Ensure adequate stock of routine, chronic care medications.
- Ensure adequate stock of basic first aid supplies, including but not limited to bandages, antipyretic medications (acetaminophen, ibuprofen), oral electrolyte solutions, and thermometers.
- Ensure that backup utility support is in place if warranted (particularly for those patients requiring electricity support for medical devices).
- Establish a "sick room" in the home for the primary management of ill household members, particularly in the event of a transmissible infectious disease.
- In the event of caring for patients with advanced symptoms "too sick" for hospital care, coordinate symptom palliation with a home care team coordinated by local public health authorities.
- Ensure the availability of a bedside commode or bedpan.
- Ensure the availability of a bedside humidifier, if possible.

Planners also need to make sure to include the ambulatory care system as part of the MCE planning process. Many people look to their primary care provider first for information on health care issues. Primary care providers would play a critical role in MCE situations, particularly that of influenza pandemic, for example, in determining which patients need to go to the hospital and which patients can be cared for at home. Planners therefore should regard primary care providers and their local ambulatory care system as an important component of a system to keep the hospitals from being overwhelmed. Given their role as critical sources of health care information and assistance for communities, planners should incorporate ways to maximize the ambulatory care system appropriately as part of the overall MCE response.

Whenever possible, specialized patient treatment requirements should be matched to the most appropriate destinations. Information services systems that provide ongoing updates of hospital bed status and capabilities should be in place and implemented to inform EMS about destination choices and to help coordinate patient distribution. This includes local, regional, statewide, and national systems such as the National Hospital Available Beds for Emergencies and Disasters (HAvBED)[62] national hospital bed availability tracking initiative.

HAvBED SYSTEM

The HAvBED System explores the feasibility of a national real-time hospital-bed tracking system to address a surge of patients during an MCE. This demonstration model is funded by the Agency for Healthcare Research and Quality and has been developed by Denver Health. A report describing the development, implementation, and evaluation of HAvBED is available at **http://www.ahrq.gov/research/havbed.**

Casualty treatment areas can be established on site, near the disaster scene, or at alternative care sites (depending on the nature of the incident) to address the volume of casualties, provide triage, assess transport needs and choices, and serve as a treatment site to which supplies will be deployed. Home health care should be used according to predetermined triage protocols to prevent unnecessary use of EMS transport and hospital resources (e.g., provision of primary care, vaccines, antiviral medications).

Using Case Examples and Best Practices

Cities have natural opportunities to exercise their disaster planning by using special events such as marathons, major sports/cultural events, or large national conventions as “planned disasters.” Special events inevitably result in large crowds, more accidents and injuries than usual, and a strain on EMS resources. Thus, they present a prime opportunity to prepare for MCEs and test MCE equipment and protocols. This approach is supported by the U.S. Department of Homeland Security in their *Lessons Learned Information Sharing* electronic database, which

provides updates and examples of community response plans, lessons learned from actual disaster events, developments of MOUs and other planning tools, best practices, and stories of successes.

The more EMS agencies are able to take advantage of opportunities such as special events and to invest in drills and training, the better prepared they will be when actual disasters arise. For example, the effective emergency response to the July 2005 London public transport bombings was a direct result of extensive training. Planners should take the time to write and read after-action reports, as they serve as useful tools for better understanding what has and has not worked and they can provide the basis for necessary improvements to be made to response capabilities.

Learning from others – other nations or other U.S. or international agencies – is a critical component of being prepared. Although EMS agencies in the United States rarely deal with MCEs, for certain countries, such as Israel, and agencies such as the U.S. Agency for International Development's (USAID) Office of Foreign Disaster Assistance, responding to medical disasters is more common. Thus, much may be learned by examining ways in which other nations respond to large-scale emergency events (e.g., bombings, natural disasters, disease outbreaks) with limited resources.

Case examples of disaster relief from USAID can be found at **http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/**.

LESSONS LEARNED INFORMATION SHARING (LLIS)

Lessons Learned Information Sharing (LLIS) contains the following types of original content: **Lessons Learned:** Knowledge and experience – positive or negative – derived from actual incidents such as the 1995 Oklahoma City bombing and the 9/11 attacks as well as observations and historical study of operations, training, and exercises. **Best Practices:** Peer-validated techniques, procedures, good ideas, or solutions that work and are solidly grounded on actual experience in operations, training, and exercises. **Good Stories:** Exemplary – but non-peer-validated – initiatives implemented by various jurisdictions that have shown success in their specific environments and that may provide useful information to other communities and organizations. Access to LLIS is restricted to verified emergency response providers and homeland security officials. The content is available at **http://www.llis.gov.**

Endnote

[59] Institute of Medicine, Committee on the Future of Emergency Care in the United States Health System. *Emergency Medical Services: At the Crossroads*. Washington: National Academies Press; 2006.
[60] Ibid.
[61] Institute of Medicine, Committee on the Future of Emergency Care in the United States Health System. *Hospital-based Emergency Care: At the Breaking Point*. Washington: National Academies Press; 2006.
[62] Agency for Healthcare Research and Quality (AHRQ). *National Hospital Available Beds for Emergencies and Disasters (HAvBED) System: Final Report.* AHRQ Publication No. 05-0103. Rockville, MD: AHRQ; December 2005. Available at: http://www.ahrq.gov/research/havbed/. Accessed July 18, 2006.

Chapter V. Hospital/Acute Care

AUTHORS

John L. Hick, M.D., Lead Author, Assistant Professor, Emergency Department, Hennepin County Medical Center

Gabor Kelen, M.D., Director, Office of Critical Event Preparedness and Response, Johns Hopkins University

Daniel O'Laughlin, M.D., Assistant Professor of Emergency Medicine, University of Minnesota/Abbott Northwestern Hospital

Lewis Rubinson, M.D., Ph.D., Health Officer, Deschutes County Health Department/Bend Memorial Clinic

Richard Waldhorn, M.D., Distinguished Scholar, Center for Biosecurity, University of Pittsburgh Medical Center

Dennis P. Whalen, Executive Deputy Commissioner, New York State Department of Health

Some of the most difficult decisions about providing an appropriate standard of medical care when resources are inadequate to meet event-driven demands will be made in hospitals. This section presents an overview of recommended systems and processes for planning and implementing the allocation of scarce hospital and acute care resources during a mass casualty event (MCE). It offers planners recommendations on developing integrated and coordinated response systems and ways to make the operational decisions for stretching and allocating scarce resources during a catastrophic MCE.

Hospital/Acute Care Issues and Recommendations At A Glance

Major Issues and Challenges

- Hospitals already at or near capacity for emergency and trauma services
- Meeting needs for basic and specialized equipment
- Coordinating competing health care systems
- Incompatibilities in communications systems
- Lack of on-call specialists and other essential staff (e.g., nurses)
- Need for security and protection
- Issues regarding professional licensing; verification; and supervision, both intra-and interstate

Recommendations Prior to an MCE

- Develop an integrated incident management system.
- Establish interhospital compacts and mutual aid agreements.
- Establish a jurisdictional Emergency Operations Center; ensure that the hospital knows how it is represented there.
- Designate a "trusted source" to serve as the hospital's resource and policy representative at the local or regional emergency response level.
- Develop a planning framework for allocating scarce resources, ideally based on existing Federal or State guidances, which articulates the integration of response strategies and tactics across facilities/agencies.
- Regionalize disaster response, through Multi-Agency Coordination (MAC) planning.
- Establish a Joint Information Center (JIC) or other centralized method to link communications regarding incident and response at the local, regional, and State levels.
- Use expert panels or planning groups to develop decisionmaking protocols or guidance for allocating scarce resources in the case of an MCE.
- Put into place an institutional and State position on how scarce resources would be allocated to health care workers.

Responding to an MCE

- Increase space capacity within the hospital through rapid patient discharge and transfer, addition of beds/cots, facilitation of home-based care, and use of alternative care sites.
- Increase staff capacity through schedule changes, staff sharing, promotion of home care, and the use of advance registered and credential-verified health professional volunteers.
- Increase access to supplies through contacts/agreements with commercial vendors.
- Institute administrative changes to facilitate processes, reimbursements, reassignment of the staff, and schedules.
- Institute clinical changes to a level appropriate to the available resources. Base triage and allocation decisions on existing guidance, if possible.
- Ensure security for the staff and supplies.
- Plan for mass mortuary needs.
- Develop strategies to identify large numbers of young children who may be separated from parents and cannot give information that would help them to be reunited.

Hospital and Acute Care in the Context of a Catastrophic MCE

The overall goal of hospital and acute care response in an MCE is to meet the reasonable care needs of as many patients as possible while also meeting at least minimal obligations for comfort to each patient.[63] In the case of a catastrophic MCE, however, hospitals will not have access to many needed resources (e.g., manual resuscitation bags to provide ventilation in response to a pandemic influenza, supply of antitoxin in the case of mass botulism poisoning). Thus, difficult decisions will have to be made regarding the allocation of available resources.

During an MCE, Federal and State agencies might be able to offer policy guidance, nationally sanctioned decision tools, and event-specific relief of certain regulatory obligations. However, the *operational* decisions regarding limited resource allocation (and the liability related to such policies) will be the responsibility of individual hospitals, communities, and regions. Thus, it will be incumbent on these localities and entities *before an event occurs* to establish and test plans for operational incident management systems that can be applied to respond to an MCE.

Challenges for MCE Planning

Much of the hospital-based response to an MCE will rely on planning, protocols, and actions that should be put into place and tested well ahead of time. In order to address those planning needs, however, planners must take into account the critical challenges that hospitals will face in responding to catastrophic events.[64] Those challenges include the following:

SURGE CAPACITY ISSUES. A recent report on hospital-based emergency care from the Institute of Medicine[2] reveals that many hospital emergency and trauma services are already at or near full capacity and thus not equipped to respond to the increased demand and decreased resources that would occur in an MCE. Interhospital agreements have the potential to alleviate overcrowding by transferring existing inpatients to other facilities, for example, but evidence from a Centers for Disease Control and Prevention study indicates that only 46 percent of hospitals have agreements of this type.[65]

INADEQUATE SUPPLIES. Lack of sufficient supplies, particularly of specialized equipment such as personal protective equipment, ventilators, and negative pressure rooms, will be a challenge for most hospitals.

NEED FOR COORDINATION, COOPERATION, AND CONSISTENCY BETWEEN HEALTH CARE SYSTEMS THAT ARE IN COMPETITION WITH ONE ANOTHER. Public health and State government may have certain authorities to make decisions during an emergency, but the scope of their powers often does not extend into health care facilities. Thought should be given to approaches to facilitating or enhancing cooperation between diverse, and potentially competing, entities.

COMMUNICATION BARRIERS. In order to respond at a level appropriate to the incident, critical information must be shared and processed across systems to give an overview of the event,

guide the mobilization of necessary resources, and inform the development of strategies and tactics at the hospital and community levels. The fragmented nature of emergency care systems leads to incompatibilities in communications and data systems between EMS systems, hospitals, trauma centers, public safety services and public health agencies.

LACK OF SPECIALISTS AND OTHER ESSENTIAL STAFF MEMBERS. Even in the current emergency and trauma care system, the supply of on-call specialists and other essential staff members (e.g., nurses) is not great enough to meet demand – a gap that will be greatly exacerbated in an MCE.

NEED FOR SECURITY PRESENCE AND PROTECTION. Hospital staff members, supplies, and assets will need to be protected in the case of an MCE, which naturally will result in scarcities and the potential for fear, theft, or violence.

Recommendations Related to Advance Planning

In the event of a catastrophic MCE, decisions and policies regarding resource allocation within hospitals will have to occur at multiple levels, ranging from the State down to local communities and institutions. Ideally, these decisions and policies should be crafted in advance of the event and should reflect nationally sanctioned guidance.

Hospital administrators and local and State elected officials must work to ensure that the framework for such decisionmaking is in place and that a public conversation is held that ensures understanding of the resources and limitations of the health care system.

They must be prepared to defend this planning to State agencies and government and help them to understand the implications of resource allocations. Local and regional legal issues must be raised and defined, and solutions must be determined.

PLANNING TEMPLATE FOR HOSPITALS

To help stimulate discussion and planning for MCEs within hospital facilities as well as at the local and regional levels, a **Mass Casualty Disaster Plan Checklist for Health Care Facilities** has been developed by the Center for the Study of Bioterrorism and Emerging Infections and the Association for Professionals in Infection Control and Epidemiology, Inc. It is available at **http://www.gnyha.org/eprc/general/.**

Ideally, hospitals should be able to follow guidance and decision support tools to make resource allocation decisions (e.g., who should receive mechanical ventilation) that are sanctioned and approved at the Federal level and are distributed by the State. Even with the support of these tools or policies, however, it is the hospital that will have to take on the role of implementing them.

To plan for addressing the hospital and acute care needs following an MCE prior to an event, hospitals and their partners should do the following:

DEVELOP AN INTEGRATED INCIDENT MANAGEMENT SYSTEM. In order to respond to the demands and scarcity of resources that would be brought on by an MCE, hospitals must have in place a system of coordination with other local hospitals, public health departments, incident commanders, public safety, and EMS systems to provide care.

Thus, integrated incident management is critical to preparing for an MCE and must be developed prior to any catastrophic event.[66]

INCIDENT MANAGEMENT SYSTEM CURRICULUM

The complexity of incident management, coupled with the growing need for multiagency and multifunctional involvement in incidents, has increased the need for a single standard incident management system that can be used by all emergency response disciplines. The Incident Command System, originally designed in California to respond to wildfires, has been adopted as the National Incident Management System, a national training curriculum for public and private sector users that can be applied to multihazard and planned event situations. Information on the training curriculum is available at **http://www.nimsonline.com/ics_training/index.htm.**

The Institute of Medicine report on hospital-based emergency care recommends that coordination and incident management require the following components:[67]

- The establishment of hospital coalitions, compacts, and mutual aid agreements to create a common platform for planning and response. This may be facilitated by the use of an existing program, such as the former Hospital Emergency Incident Command System, which has been revised and renamed the Hospital Incident Command System (HICS). HICS is a well-instituted and nationally recognized approach to disaster management.
- The establishment of a jurisdictional Emergency Operations Center. Each hospital should be familiar with its local office of emergency preparedness and know how it is represented there, whether through assignment of direct liaison, the public health department, a hospital association, the EMS system, or another mechanism.
- The designation of a particular hospital or local public health agency as a "trusted source" to serve as the hospital's resource and policy gateway within the region during a major multijurisdictional event.

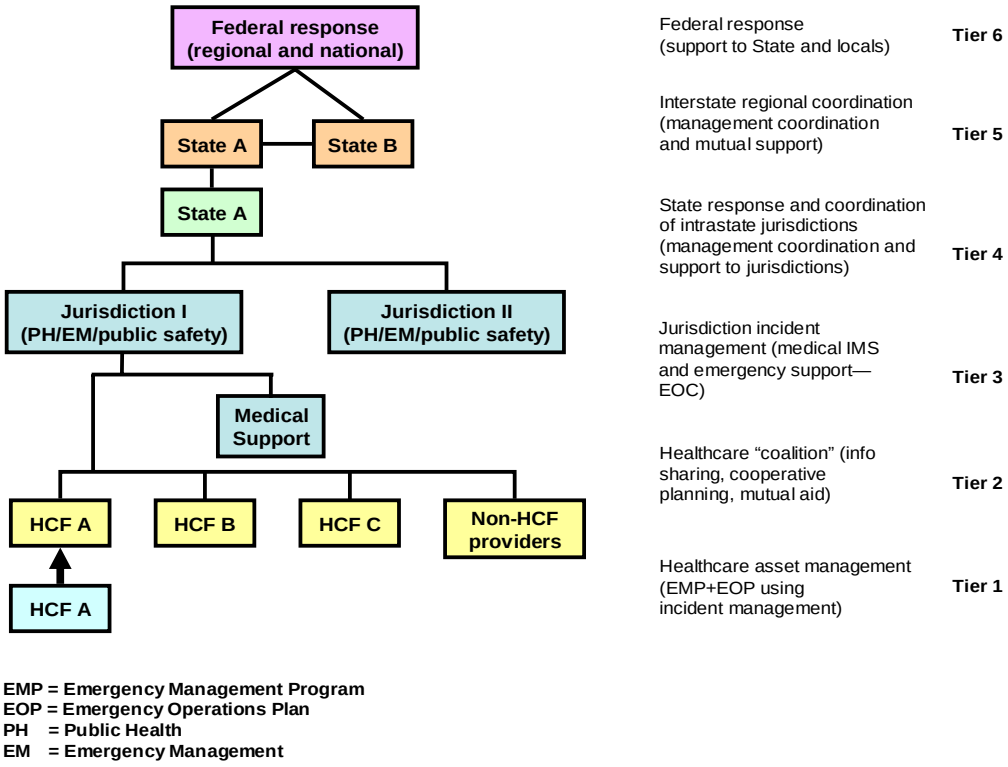
HICS

HICS applies the principles of incident management to health care facilities. The system helps coordinate emergency response between hospitals and other emergency responders with a system based on a predictable chain of management, defined responsibilities, prioritized response checklists, clear reporting channels for documentation and accountability, and a common nomenclature to facilitate communications. Further information is available at **http://www.emsa.ca.gov.**

DEVELOP A PLANNING FRAMEWORK FOR ALLOCATING SCARCE RESOURCES. This framework should be transparent and shared with key stakeholders in the health department, attorney general's office, and governor's office as well as with the community, both in advance of and during an MCE. The framework should establish ways to do the following:

- Define or project the resource shortfalls and the impact on clinical care.
- Identify the facilities and area to be affected.
- Request additional resources, facilitate the transfer of patients out of the affected area, or facilitate alternative strategies for patient care (e.g., offsite care, home care).
- Develop and disseminate supportive policy and clinical guidance (e.g., triage and treatment recommendations, decision tools) – ideally ones that have been nationally sanctioned or federally approved and disseminated. Sources of expertise may include the academic, private, or public medical care system. Clinical guidance or decision aids should reflect any available Federal guidance and ideally be flexible enough to allow hospital and clinician discretion in making resource allocation decisions, as deemed medically justified.
- Provide guidance for liability relief for providers in good-faith compliance with such policies and guidance.
- Include guidance on the equitable management and allocation of scarce resources. For example, prior to an MCE both government and private institutions should know the extent to which they can commandeer equipment or information about remaining supplies and to allocate resources.
- Articulate the integration of response strategies and tactics across facilities and agencies at the local and regional levels (see Figure 1). Use a tiered approach, ranging from the smallest unit, the individual health care facility (HCF) or group of providers (Tier 1); through health care coalitions (Tier 2) and jurisdictional incident management systems (Tier 3); to broader State, interstate, and Federal response levels (Tiers 4–6). Resource coordination needs that overwhelm the lower tiers spill over onto the higher tiers either to meet the resource needs or to make policy decisions to cope with the lack of resources.

Figure 1. The Decisionmaking Process for Resource Allocation and Policy Guidance



Source: Medical Surge Capacity and Capability: A Management System to Integrate Medical and Health Resources During Large-scale Emergencies. CNA Corporation, under contract to HHS (August 2004). Available at **http://www.hhs.gov/ophep/publications.html.** Accessed November 27, 2006.

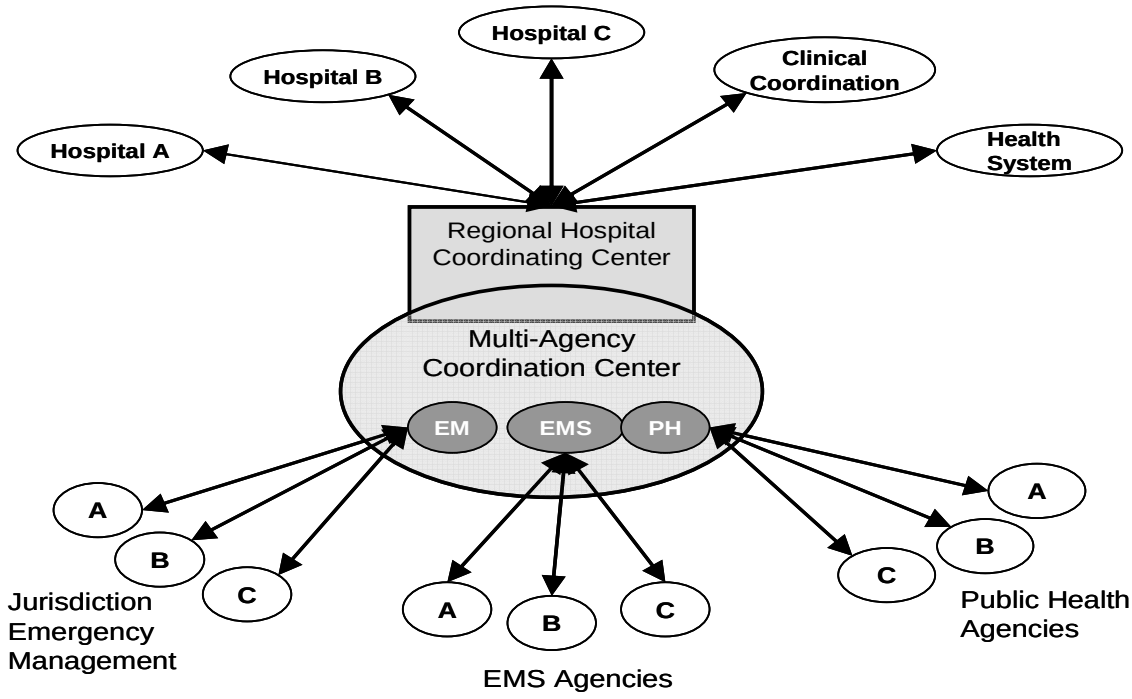
Coordinating Community and Regional Planning of Hospital/Acute Care MCE Responses

Regional Planning

The State health department has the overall responsibility for projecting health resource needs in the event of a major health-related emergency and for allocating scarce resources to meet those needs. Some States have intrastate regional coalitions (clearinghouse hospitals, regional coordinating hospitals), which can assist the State health department in managing resource allocation within their area. This arrangement establishes a more effective span of control for the State, with only a few regions rather than multiple individual facilities, reporting data and resource needs. It also allows for plans to consolidate inventories of supplies, epidemiological data, medical response, communications, and command and control. These intrastate regional coalitions, where they exist, should be incorporated into regional Multi-Agency Coordination (MAC) planning and response (see Figure 2). Planners should expect that

there will be issues with communication, coordination, and overlapping responsibilities, and thus it is important to practice all elements of the State, regional, or local interface in advance. Such advance practice would enable planners to find ways to account for and adapt to the variability in relationships among local emergency operations centers, hospitals, regional MACs, and the State.

Figure 2. MAC Model



Lines illustrate relationships within the MAC. Communication and coordination should not be strictly limited to these channels of connection.[68]
Source: Based on Metropolitan Hospital Compact MAC model – Minneapolis/St. Paul, Minnesota.

Interstate regional coordination is another means of managing allocation of scarce resources. Interstate agreements and cooperation help promote sharing of assets across State lines. These types of agreements also help ensure consistency of response (e.g., National Capital Region) where inconsistencies between State plans could prove problematic. This level of interstate cooperation is difficult to achieve but is one of the most important ways to maximize resource allocation. The development of national-level clinical decision tools to address commonly limited resources (e.g., dialysis, mechanical ventilation) would be very valuable in helping to facilitate greater interstate cooperation.

PLANNING RESOURCES

The Minnesota Department of Health MAC Plan has been developed to facilitate health-related policy coordination and resource allocation decisions among multiple jurisdictions and health-related entities to provide for the safe, rapid, and coordinated response to a health-related emergency. Information is available at **http://www.health.state.mn.us/oep/planning/allhazards.html#macresponserecovery.**

A Patient Care Coordination Planning Guide, also developed by the Minnesota Department of Health, is available on CD by request to MDH Office of Emergency Preparedness at **http://www.health.state.mn.us/oep.**

Coordination and communication

The State, rather than local jurisdictions, should take responsibility for overall risk communication management. This includes information provided to hospitals and health care systems, as well as the provision of public information releases and information for providers or members of the public that are posted through telephone, the Internet, the media, and other access points. A JIC should be established as well as other ways to link communications at the local, jurisdictional, and State levels to establish mechanisms for media message development.

Communications strategies must be established and practiced ahead of time to ensure that messages will come from accurate sources in a timely and consistent manner. These strategies should include the use of risk communication, regular media releases, and press conferences.

JOINT INFORMATION CENTER (JIC)

A JIC is a centralized communication hub for handling emergency events. It serves to gather incident data, analyze public perceptions of the event, and give the public or special targeted audiences accurate and comprehensive incident and response information. Planning for the JIC should be undertaken in advance, including processes, procedures, and staff training. This allows communities to be more proactive in their response to the information needs of the public, industry, and government. A full description of the JIC model is available from the U.S. National Response Team Web site at **http://www.nrt.org/production/nrt/nrtweb.nsf/allattachmentsbytitle/A-55jic/$file/jic.pdf?openelement.**

Using expert panels or planning groups

At this time, no current predictive model is sufficient to serve as a decision framework for determining the allocation of critical care resources (e.g., ventilators, intensive care therapies). One valuable strategy for examining the allocation of scarce resources, however, is to convene a

balanced expert panel that can bring in multiple viewpoints and establish decisionmaking guidelines. The panel must be inclusive of relevant stakeholders who reflect the jurisdictional area and its demographics, in addition to recognizing border issues with adjoining States. The composition, functions, and operational role of these groups must be carefully considered.

CONVENING AN EXPERT PANEL TO ADDRESS THE ALLOCATION OF SCARCE RESOURCES: THE EXAMPLE OF NEW YORK STATE

In March 2006, the New York State Task Force on Life and the Law (TFLL), in partnership with the State's Department of Health, convened a workgroup to consider clinical and ethical challenges in the allocation of mechanical ventilators in a public health crisis. The group includes experts in the areas of law, medicine, policymaking, and ethics. Its goal is to develop clinical and ethical guidance for local health care systems that will promote the just allocation of ventilators in an influenza pandemic. The panel considered a range of policy options necessary to support such an allocation system, including the development of recommendations for laws or regulations in areas including liability and appropriate standards of care. Further information on the TFLL is available at **www.health.state.ny.us/nysdoh/taskfce/index.**

Issues of resource allocation ideally would be addressed by expert panels or groups as part of MCE planning. An ad hoc expert panel may be called on to address an unexpected event to determine which factors will be used for decisionmaking based on a particular situation and the specific resource in short supply. The community member panels that allocated scarce hemodialysis resources in the city of Seattle during the 1960s can serve as an historic example of this process.

USING COMMUNITY PANELS TO HELP ALLOCATE SCARCE RESOURCES: THE EXAMPLE OF HEMODIALYSIS IN SEATTLE

When hemodialysis was first introduced in 1960, it was available only in limited supply. In order to decide which patients would receive this life-prolonging treatment, the city of Seattle established a two-committee decisionmaking process. The first committee was comprised of physicians and the second made up of a cross-section of community representatives. The physician committee took into account medical and psychiatric criteria, while the community group weighed factors such as age, future potential, and other intangible measures of personal and community value.

Some questions that States should consider when developing an expert panel include:

- Is the group considered an advisory body or a policy development body for the health department? If it is advisory, what internal process within the department is followed to develop and approve the policy?
- What is the liability of the members of the group (if any) for their decisions?
- What is the expectation of the group during an event? How often will they meet? What will be their sources of information? Is there enough redundancy in the group in case of illness or absence?
- Would the composition of the group need to be modified based on the type of MCE? If so, who would decide?

How does the group convene, develop consensus and recommendations, and modify them as needed?

The recommendations of the expert panel should be vetted and shared with larger, more diverse groups to allow feedback and further modifications. Those groups might include physicians or other health care professionals, palliative care providers, ethicists, State health officers, representatives from the Office of Emergency Preparedness, community leaders, and others. Any guidelines or decisionmaking framework developed should be circulated between facilities and jurisdictions prior to an event.

Increasing System Capacity During an MCE

During an MCE, the capacity of the health care system should be expanded according to an incident management system-directed mobilization of physical space, personnel, and material resources – sometimes referred to as "space, staff, and stuff." For example, in advance of an MCE, hospitals should establish a preference list of supplemental providers to expand staff capacity. These providers might include local hospital staff, clinic staff, and health professional volunteers who have registered with and had their credentials verified by one of the State Emergency Systems for Advance Registration of Volunteer Healthcare Professionals (ESAR-VHP), Medical Reserve Corps, National Disaster Medical System teams, trainees, patient family members, military members, Community Emergency Response Teams, and lay volunteers. Policies should be in place in advance to credential staff members and manage deployment of nonhospital personnel at community and hospital levels, and there should be a plan for managing spontaneous volunteers.

Another critical component of increasing system capacity during an MCE is informing the public. It is important to provide the public with information on two fronts: information about ongoing events and how to care for themselves, as well as information that will enable them to make appropriate decisions about their own personal health care situation. This information

process will help limit or slow the spread of disease while engaging the public in the allocation of scarce resources.

The goal of informing the public can be achieved through a two-pronged approach: the use of effective media campaigns to educate and inform most of the public, supported by enlisting the assistance of established community health call centers (poison centers, nurse advice lines, public health hotlines) to help address the public's additional concerns and questions. This approach should enable most people to care for themselves, and at the same time, will help to lessen demands on the healthcare system.

Short-term strategies

Short-term strategies may be applied to increase healthcare facility capacity in cases where resource shortages can be expected to be resolved relatively quickly (within hours or days). These strategies usually do not require a systematic assessment of the standard of care being provided. They may include the following:

Increase space capacity with:

- Rapid discharge of emergency department (ED) and other outpatients who can continue their care at home safely
- Rapid discharge of inpatients who can safely continue their care at home (or at alternate facilities if they are available)
- Cancellation of elective surgeries and procedures, with reassignment of surgical staff members and space
- Reduction of the usual use of imaging, laboratory testing, and other ancillary services
- Expansion of critical care capacity by placing select ventilated patients on monitored or step-down beds; using pulse oximetry (with high/low rate alarms) in lieu of cardiac monitors; or relying on ventilator alarms (which should alert for disconnect, high pressure, and apnea) for ventilated patients, with spot oximetry checks
- Conversion of single rooms to double rooms or double rooms to triple rooms if possible
- Designation of wards or areas of the facility that can be converted to negative pressure or isolated from the rest of the ventilation system for cohorting contagious patients; or use of these areas to cohort those health care providers caring for contagious patients to minimize disease transmission to uninfected patients
- Use of cots and beds in flat space areas (e.g., classrooms, gymnasiums, lobbies) within the hospital for noncritical patient care
- Transfer of patients to other institutions in the State, interstate region, or nationally.

- Facilitation of home-based care for patients in cooperation with public health and home care agencies

- Establishment of mobile or temporary evaluation and treatment facilities in the community to supplement usual clinic locations. These locations also may be used to screen those with mild symptoms when medications are available and must be taken early in the course of illness to be effective.

Expand staff capacity with:

- Call-in of appropriate staff members

- Changes in staff scheduling (e.g., duration of shifts, staffing ratios, changes in staff assignments)

- Requests for supplemental staff members from partner hospitals through the use of Emergency Systems for Advance Registration of Volunteer Health Professionals (ESAR VHP), clinics, the Medical Reserve Corps (MRC), the local American Red Cross, public health, public works, schools, or other agencies and State and Federal sources as applicable.

STATE COORDINATION OF VOLUNTEER RESOURCES: EMERGENCY SYSTEMS FOR ADVANCE REGISTRATION OF VOLUNTEER HEALTH PROFESSIONALS

State Emergency Systems for Advance Registration of Volunteer Health Professionals (ESAR-VHP) systems are statewide mechanisms for recruiting, registering, and verifying credential information of potential health volunteers in a State. These systems should support and include information about volunteers involved in organized efforts at the local level (such as MRC units) and the State level (such as National Disaster Medical System [NDMS] teams). The ESAR-VHP systems also will coordinate broader Statewide recruitment and registration of health professionals who would be willing to serve in an emergency, but are not interested in being a part of a trained, organized unit structure such as MRC or NDMS. State ESAR-VHP systems provide a single, centralized source of volunteer information to facilitate intrastate, State-to-State, and State-to-Federal transfer and mobilization of volunteer health professionals.

More information about the national effort to develop State ESAR-VHP systems, including information about the legal protections offered to volunteers in each State and Territory, and links to State systems is available at **http://www.hrsa.gov/esarvhp.**

THE MEDICAL RESERVE CORPS (MRC)

The mission of the MRC is to organize medical, public health, and other volunteers in support of existing programs and resources to improve the health and safety of communities and the Nation. MRC units provide personnel to support and supplement the existing emergency and public health agencies in the community. MRC leaders are encouraged to adopt an all-hazards approach and more broad-based public health initiatives, including a focus on increasing disease prevention efforts, and enhancing emergency preparedness. Medical Reserve Corps volunteers include medical and public health professionals such as physicians, nurses, pharmacists, dentists, veterinarians, and epidemiologists. During the 2005 Hurricane Season, MRC members provided support for American Red Cross health services, mental health and shelter operations. MRC members also supported Federal response efforts by staffing special needs shelters, Community Health Centers and health clinics, and assisting health assessment teams in the Gulf Coast region. For example, **The Southside (Boydton, VA) MRC** organized, conducted, and supervised a local food relief and water collection site for Hurricane Katrina victims. In all, 53,000 pounds of food and water were shipped to Lamar County, Mississippi. **The Rhode Island MRC**, along with the Rhode Island DMAT team, was largely responsible for staffing a weeklong clinic that received 105 evacuees from Louisiana. The clinic averaged 26 visits per day with daily blood pressure checks provided. Further information on MRC is available at **http://www.medicalreservecorps.gov.**

- Promotion of home care and discouragement of the "worried well" from seeking hospital evaluation and care through the use of media campaigns and access to community health call centers
- Establishment of guidelines and public messaging describing how to evaluate symptoms, what treatment can be safely delayed, and how to care for themselves at home
- Sharing of small numbers of specialized staff members (e.g., burn nurses, pediatric critical care staff members) with hospitals in need
- Activation of memoranda of understanding (MOUs) with regional and distant hospitals, health systems, or State disaster medical assistance teams.

Increase access to supplies by:

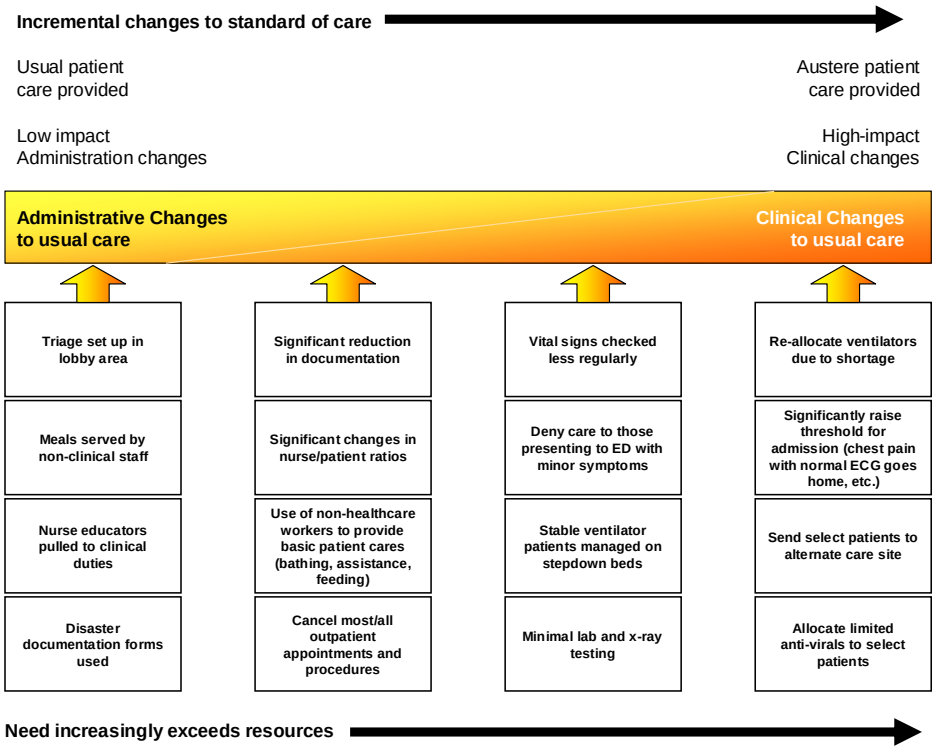
- Activation of MOUs with commercial companies for supply chain continuity.

If these strategies are not sufficient to meet the demands of the incident and no immediate relief is available, then a systematic evaluation of the level of care being provided must be conducted. These surge strategies should be reviewed and revised based on the available resources.

The Spectrum of Adaptation: From Administrative to Clinical Change

In the case of a longer-term resource shortage, strategies for meeting the event-generated demands of an MCE can be classified along a spectrum that includes two categories of changes: administrative adaptations and clinical adaptations, as shown in Figure 3 below.

Figure 3. Administrative and Clinical Adaptations to Resource Poor Situations



ADMINISTRATIVE ADAPTATIONS are designed to increase provider availability for patient care. Though their effect on clinical care should be minimal, it must be recognized that changes in shift length or staffing patterns will increase the risk for complications such as infections.

Administrative changes generally can be implemented with minimal discussion by hospital administration or nursing personnel, but such changes require preplanning. Examples of administrative changes may include the following:

- Changes to reduce provider documentation, billing and coding, registration, and other administrative policy burdens. These should be discussed in advance with the State and Federal agencies that oversee public health insurance programs and with private payers.
- Cancellation of elective procedures. The definition of "elective" may vary with the severity and duration of the situation and requires daily review; a surgery to remove a neoplasm, for example, may be elective for 24 hours but not for weeks.
- Reassignment of qualified administrative nursing staff members to clinical roles or use of nonhospital staff members, potentially including family members, to provide basic patient care.
- Adoption of Continuity of Operations (COOP) strategies within each department as needed to cope with the impact of the event. A good COOP plan details the critical functions and staffing within each department and lists ways for these functions to be carried out when the staff or infrastructure is inadequate to carry on daily operations.

SURGE CAPACITY RESOURCES

The Joint Commission on Accreditation of Healthcare Facilities Report *Surge Hospitals: Providing Safe Care in Emergencies* is available online at **http://www.jointcommission.org/PublicPolicy/surge_hospitals.htm.**

Seamless Emergency Medical Logistics Expansion System (SEMLES) promotes the development of collaborative relationships between public and private entities and between local and regional partners to expand surge capacity. Information on SEMLES is available at **http://www.disasterhelp.net/resources.**

One important staffing issue to consider in the context of MCE planning is the concern that a significant proportion of health care providers will fail to report to work if they perceive a threat to themselves or their family members from contamination by biological or radiological agents. Certain States have provisions to delicense or otherwise sanction (or even arrest, in the State of Maryland) providers who do not report for duty during a declared disaster. It is important, to remember, however, that although health care providers have a duty to act and may have been supported in their training by Federal dollars, there are real concerns about the "duty to family" and issues of child care, among others, which may not be solved easily.

Careful determination of priority groups and essential personnel as well as facilitation of child care, providing adequate PPE, providing housing apart from family for workers who request it,

and other "carrots" need to accompany the regulatory "sticks" designed to ensure that health care workers are able to work (and work safely) during a disaster.

CLINICAL ADAPTATIONS represent the allocation of scarce resources or services based on the ethical principles outlined in Chapter 2.

Examples of clinical adaptations include the following:

- Triage of patients to home care, acute care sites, or other offsite locals who would otherwise be treated as inpatients
- Assignment of limited resources (e.g., ventilators, radiographs, laboratory testing) to those most expected to benefit
- Provision of specialty care (e.g., burn or intensive care) by nonspecialty trained staff members (ideally with supervision by appropriately trained staff members).

Implementing Clinical Changes to Respond to an MCE

EXAMPLES OF POSSIBLE RESPONSE PROCESSES

- The incident commander recognizes the need for systematic clinical changes.
- The planning chief gathers any guidelines, information, and resources.
- A clinical care committee (predetermined members and designees for toxic, infectious, and trauma situations) is convened. Members may include a hospital administrator, a hospital attorney, nursing supervisor, a respiratory care supervisor, a hospital ethicist, a community representative, and representatives from clinical departments.
- The clinical care committee reviews existing strategies/protocols and determines:
  - Methods to meet patient care needs, location of care, assignment of resources
  - Additional changes in staff responsibilities to redistribute specialized staff and incorporate other health care providers, lay providers, or family members
  - A mechanism to reassess local/regional hospital efforts and needs and recommend changes on a regular basis.
- Information is disseminated to inpatient services, outpatient services, the regional hospital coordination point, and State and local health departments.
- Security and behavioral health response plans are implemented.
- Triage plan is implemented to determine ED/outpatient screening of patients, patient discharge, removal from therapy, and bed assignments.
- Just-in-time training or education is implemented for health care workers, patients, and family members.

The hospital should be able to follow State guidance regarding clinical triage decisions. If no guidance exists, it will be incumbent on the hospital to have a plan or strategy for bringing together the appropriate personnel who can make the best decisions possible and reevaluate the situation during each planning cycle (e.g., each shift a day). When there is little advance evidence to guide allocation decisions (for example, not knowing how different age groups with pandemic influenza respond to mechanical ventilation), good clinical judgment by experienced clinicians will be the final common denominator to justify resource allocation decisions. The decisionmaking process, based on ethical judgments that include maximizing good consequences across the many while meeting at least minimal duties and obligations to all, should be shared openly with staff members, patients, and the public and should be as consistent as possible across facilities.

The goal is to adjust clinical care to a level appropriate to the resources available and to do so in as smooth, transparent, consistent, and incremental a fashion as possible. There are no clear "trigger" or "trip" points to indicate when the shift from reactive, mostly administrative changes to proactive, clinical changes must occur. Communities and regions should coordinate as much as possible. Situational awareness by the Incident Commander and Planning Section Chief can help anticipate or recognize resource bottlenecks that may require intervention.

Allocating Scarce Resources

Patient assessment

The American Medical Association (AMA) has identified five important criteria to consider when the allocation of scarce resources is required: likelihood of benefit, change in quality of life, duration of benefit, urgency of need, and amount of resources required. According to the AMA guidance, all five of these criteria must be considered. If there is no differentiation in the criteria between patients, then resources should be allocated on a "first come, first served" basis.

At a minimum, patient assessment should include the following factors:

- The patient's need for the resource
- Potential to return to the baseline state
- Overall acute resource needs of the patient
- Age and functional assessment (e.g., Quality Adjusted Life Years or other tools when significant functional differences are present between patients)
- Underlying health and prognosis related to an underlying disease(s)
- Event-specific or injury-specific prognostic factors.

Patient triage

There are three basic types of triage. Primary triage is the first triage of patients into the medical system (it may occur prehospital), at which point patients are assigned an acuity level based on the severity of their illness/disease. Secondary triage is the reevaluation of the patient's condition after initial medical care (see box).[69] This may occur at the hospital following EMS interventions or after initial interventions in the ED. Tertiary triage is the reevaluation of the patients' response to treatment after further interventions and is ongoing during their hospital stay. This is the least practiced and least well-defined type of triage.

Historically, triage has involved four levels of priority for traumatic injuries:

- Green – delayed treatment – has minor injuries or illness and should not pose a threat to life or limb.
- Yellow – intermediate – has injuries or illness that may result in death or disability but pose no immediate threat to life or limb.
- Red – critical – has injuries or illness that will result in death within the hour unless interventions occur.
- Black – expectant or deceased – is expected to die because of severity of illness or injuries or has died.

It is important to note that criteria such as gender, race, ability to pay, social worth, perceived obstacles to treatment, patient contribution to illness, or past use of resources are not appropriate criteria for determining the allocation of scarce resources. Age may be considered only as it relates to underlying organ function and prognosis.

An experienced health care provider should be involved in any decision to classify a patient as "black" during a disaster. As described in Chapter VII, all such patients should have access to palliative care (analgesia, sedation, physical and behavioral cares) to the extent possible under the circumstances. Expectant patients should be reassessed regularly for comfort, for improvements in their situation, or in case resources become available unexpectedly.

Studies have shown that experienced health care providers are generally very accurate at assigning triage levels in the ED on a daily basis,[70] though there are no studies to determine to what degree this is true in disasters.

An example of an existing triage tool is the Emergency Severity Index (ESI), perhaps the best-studied hospital ED approach to triage. While highly predictive of resource use within the ED, the ESI was not designed, however, for disaster situations per se. Simple Triage and Rapid Treatment triage may be used for traumatic injuries, but it is perhaps too simplistic for application in the ED setting and has not been validated.

THE EMERGENCY SEVERITY INDEX (ESI)

The ESI is a five-level ED triage algorithm that provides clinically relevant stratification of patients into five groups, from 1 (most urgent) to 5 (least urgent), on the basis of acuity and resource needs. The ESI Implementation Handbook is available at **http://www.ahrq.gov/research/esi/esi1.htm.**

Overall illness severity and mortality prediction scores (Mortality Probability Model II, Sequential Organ Failure Assessment) and organ system-specific mortality predictors (oxygenation index – FiO_2 x mean airway pressure / pO_2 has predictive value in pediatric patients, for example) may be used to provide quantitative estimates of survival or severity. These prediction scores present limitations, however, in that they are validated on cohorts, not individuals, and generally require data obtained from laboratory or other invasive measures.[71,72]

An example of a secondary triage decision tool is the American Burn Association table of mortality graphed against age and percent body surface area burns, which allows a burn surgeon to make immediate rough determinations of the resource needs and projected mortality of a given patent and allocate, when needed, limited resources available.

Select Operational Considerations

In addition to allocating scarce resources, an MCE will require that hospitals also address many operational considerations, including security and mass mortuary.

Security

Disasters that require systematic changes in the provision of health care are likely to have had similar pronounced effects on the community at large. Civil unrest due to supply line disruptions, infrastructure damage, and resource scarcity are not uncommon in such situations. Resources in short supply may be subject to hoarding or internal pilfering (e.g., of vaccine, of antibiotics). Any changes in usual clinical care that result in resources not being available to all patients who may need them may increase the potential for violence against health care facilities and providers.

Hospitals should work with their community law enforcement agencies and security staff members to develop a security assessment and vulnerability analysis and a plan for augmenting hospital security during a widespread disaster, when demands on law enforcement may be extreme. This plan should prioritize hospital assets for protection and rely, when possible, on physical and technological, rather than human solutions. Proactive communication with the public can reduce the potential for civil unrest and should be part of community and institutional strategies.

Security measures that hospitals may wish to consider in an MCE include:

- Increased security personnel
- Increased monitoring of hospital premises and surroundings
- A lockdown plan that can be rapidly implemented (including campus buildings that may be used in nontraditional capacities as part of the facility response plan)
- Single or few designated entrances
- The limit of a single visitor (or no visitors) per patient
- Metal detectors and security screening at entry points
- Augmented law enforcement presence (must have mutual aid agreements in place ahead of an event; consider uniformed peace officers or National Guard personnel)
- Equipping and training hospital security personnel with less-than-lethal methods of behavioral control (if not already so equipped) with appropriate policies and oversight (e.g., batons, pepper spray, TASER electroshock guns or similar electric-current immobilizer devices).
- Other deterrents at entrances (presence of canine officers, increased uniformed security presence).

Mass Mortuary

Hospitals should understand clearly the community plan for management of excess casualties. In some cases, hospital responsibilities for record keeping and reporting will change in a disaster. Temporary facility morgue locations may be required, and regional processing sites may be needed. The role of the medical examiner's office versus that of public health should be clearly defined. This should include situations such as pandemic influenza, which normally would not involve the medical examiner's office.

Provisions should be made for appropriate solutions to barriers presented by culturally based funeral and burial practices. Every effort should be made to preplan for adjusting standards of care as appropriate to the situation, to advise and involve the public and faith-based communities in these decisions, and to ensure that the minimum level of disruption to usual cultural practices and the maximum level of dignity are afforded the deceased and their families.

CONDUCTING PATIENT TRIAGE
NEW ORLEANS INTERNATIONAL AIRPORT – HURRICANE KATRINA

Three Disaster Medical Assistance Teams (DMATs) were faced with the task of providing medical care to tens of thousands of patients at New Orleans International Airport who had been evacuated or rescued from their homes, nursing homes, and hospitals. Approximately 300 of these patients were stretcher bound. Few had acute injuries, but many had complex medical problems exacerbated by dehydration, infections, and lack of medications.

There was essentially no ability to communicate externally, nor was there an identified command element to request additional resources and evacuation assistance in the first 24 hours of the operation. Standard triage tags were used for nonambulatory patients, and they were prioritized for care and evacuation. Approximately 50 extremely sick patients were tagged as "expectant" due to the lack of clinical resources and transferred to a separate area of the airport. Many of these were elderly with complex underlying health problems and unstable vital signs, coma, or other poor prognostic signs – and were expected by the clinician to die within the next 24 hours. As staff members and resources became available, some of these individuals were reclassified as "red" and provided care. Ultimately, only 26 of these patients died, thanks to the efforts of the DMATs, who also treated hundreds of other critical and serious patients. A Herculean evacuation effort over the subsequent several days and the arrival of additional staff members and resources prevented further deaths.

Endnotes

[63] Society of Critical Care Medicine Ethics Committee. Consensus statement on the triage of critically ill patients. *JAMA*. 1994;271:1200–1203.
[64] Institute of Medicine. *Hospital-based Emergency Care: At the Breaking Point*. Washington: National Academies Press; 2006.
[65] Niska RW, Burt CW. Bioterrorism and mass casualty preparedness in hospitals: United States, 2003. *Advance Data*. 2005;364:1–11.
[66] Barbera J, Macintyre A. *Medical and Health Incident Management System: A Comprehensive Functional System Description for Mass Casualty Medical and Health Incident Management*. Washington: George Washington University Institute for Crisis, Disaster, and Risk Management; December 2002. Available at: www.gwu.edu/~icdrm. Accessed November 16, 2003.
[67] Institute of Medicine. *Hospital-based Emergency Care: At the Breaking Point*. Washington: National Academies Press, 2006.
[68] Based on Metropolitan Hospital Compact MAC model–Minneapolis/St. Paul, MN.
[69] Saffle JR, Gibran N, and Jordan M. Defining the ratio of outcomes to resources for triage of burn patients in mass casualties. *Journal of Burn Care & Rehabilitation.* November/December 2005;26(6): 478-482.
[70] Lemeshow S, et al. Mortality probability models based on an international cohort of intensive care unit patients. *JAMA*. 1993;270:2478–2486.
[71] Herridge MS. Prognostication and intensive care unit outcome: the evolving role of scoring systems. *Clinics in Chest Medicine*. 2003;24(4):751–762.
[72] Pettila V, Pettila M, Sarna S, Voutilainen P, Takkunen O. Comparison of multiple organ dysfunction scores in the prediction of hospital mortality in the critically ill. *Critical Care Medicine*. August 2002;30(8):1705–1711.

Chapter VI. Alternative Care Sites

AUTHORS

Stephen Cantrill, M.D., Lead Author, Associate Director, Department of Emergency Medicine, Denver Health Medical Center

Carl Bonnett, M.D., Emergency Medical Services Fellow, Department of Emergency Medicine, Denver Health Medical Center

Dan Hanfling, M.D., Director, Emergency Management and Disaster Medicine, Inova Health System

Peter Pons, M.D., Professor of Emergency Medicine, Department of Surgery, University of Colorado Health Sciences Center

This chapter discusses the issues surrounding non-Federal, non-hospital-based alternative care sites (ACSs). It describes different types of ACSs as well as critical issues and decisions that will need to be made regarding these sites during mass casualty event. Potential barriers are addressed, and examples of case studies are included.

Alternative Care Sites (ACS) Issues and Recommendations At A Glance

MAJOR CHALLENGES TO SUCCESSFUL ACS PLANNING AND ESTABLISHMENT

- Lack of regional and State planning with clear delineation of responsibilities and authority
- The requirement that multiple groups work together who traditionally have not done so, including health care providers with conflicting institutional allegiances, hospitals, emergency managers, regional planners, and local and State health departments
- Lack of financial inducements to create, drill, and execute the plan
- Issues regarding professional licensing; verification; and supervision, both intra-and interstate
- Funding and compensation issues

RECOMMENDATIONS FOR ACS PLANNERS

- Ensure that all communities have an integrated mass casualty event (MCE) plan in place to provide for expansion of health care services into ACSs when existing health care providers and institutions become overwhelmed.
- Constitute a planning and implementation committee comprised of, at a minimum, emergency managers, planners, public health departments, health care providers and institutions, local and regional government representatives, and appropriate private partners.
- Ensure that a concept of operations (CONOPS) document is prepared to define in advance the anticipated role that the ACS facility will serve.
- Identify and assess potential sites for implementation of an ACS prior to an incident. Whenever possible, put in place agreements to permit such use.
- Obtain, stockpile, and store supplies, equipment, and pharmaceuticals sufficient to meet the anticipated role for the ACS as defined in the CONOPS in a fashion that will permit rapid deployment to a selected site.
- Prepare a plan for personnel staffing sufficient to meet the anticipated role for the ACS as defined in the CONOPS.
- Anticipate and plan for operational and logistic support of the ACS.
- Plan for the needs of pediatric patients.

Background

The impact of an MCE of any significant magnitude likely will overwhelm – and indeed may render inoperable – hospitals and other traditional venues for health care services. This situation will necessitate the establishment of ACSs for the provision of care that normally would be provided in an inpatient facility, including acute, subacute, and chronic care.

The concept of providing medical care in a nonhospital ACS has been demonstrated throughout history: during the Civil War, the aftermath of the San Francisco earthquake of 1906, the influenza pandemic of 1918–1919, and more recently the aftermath of Hurricane Katrina. During the Cold War in the 1950s and 1960s, this concept was developed and formalized by the U.S. Civil Defense Agency in cooperation with the Department of Health, Education and Welfare as "Packaged Disaster Hospitals" (PDHs). These PDHs consisted of modularized, predeployed units for 50, 100, or 200 beds. In 1972, Congress discontinued its support funding

for the PDH concept. The 2,500 deployed units were declared to be surplus and were discarded over the next decade. More than three decades later, however, we find ourselves in the interesting position of rediscovering, resurrecting, and refining the concept of ACSs.

ACSs in the Context of an MCE

The focus on catastrophic bioterrorism over the past decade has resulted in some key efforts in the development of the concept of ACSs. The most widely recognized effort has been the development of the Acute Care Center (ACC) and Neighborhood Emergency Health Center (NEHC) concepts by the U.S. Army Soldier and Biological Chemical Command (SBCCOM).

NEHC AND ACC CONCEPTS

Under the auspices of the Department of Defense and the Domestic Preparedness Program, the Biological Weapons Improved Response Program developed the Modular Emergency Medical System (MEMS) to provide systematic, coordinated, and effective medical response in the event of a large-scale biological terrorism incident. MEMS strategy established a framework for which outside medical resources could be used to enhance local response efforts in two types of expandable patient care modules: the NEHC and the ACC. The NEHC is designed to function as a high-volume casualty reception center, performing victim triage and dispensing medicines and information. The ACC is designed and equipped to treat patients who need inpatient treatment but do not require mechanical ventilation and those who are likely to die from an illness resulting from an agent of bioterrorism.

Sources: Acute Care Centers: A Mass Casualty Care Strategy for Biological Terrorism Incidents (December 2001), and Neighborhood Emergency Help Centers: A Mass Casualty Care Strategy for Biological Terrorism Incidents (May 2001). Both documents prepared in response to the Nunn-Lugar Domestic Preparedness Program by the Department of Defense. See **http://www.nnemmrs.org/surge.html.**

The innovative body of work surrounding the development of the ACC and NEHC concepts has addressed several key issues related to the delivery of care outside of established hospitals, including:

- The level and scope of care to be delivered
- The physical plant required for the establishment of such facilities
- Staffing requirements for delivery of such care
- Medical equipment and supplies requirements
- The incident management system required to integrate such facilities with the overall delivery of health care in the context of a disaster.

In the aftermath of the September 11, 2001, attacks, more concerted focus was placed on the definition and development of public health and medical surge capacity. A distinction was drawn between *health care facility* surge capacity and *community* surge capacity, with the understanding that community surge capacity strategies were focused on the creation of out-of-hospital solutions to the delivery of health care, closely mirroring the ACC concept.

This understanding led to the emergence of a new definition of ACS, one that included a location for the delivery of medical care that occurs outside the acute hospital setting for patients who, under normal circumstances, would be treated as inpatients. In addition, the ACS has come to be viewed as a site to provide event-specific management of unique considerations that might arise in the context of catastrophic MCEs, including the delivery of chronic care; the distribution of vaccines or medical countermeasures; or the quarantine, cohorting, or sequestration of potentially infected patients in the context of an easily transmissible infectious disease.

Surge Capacity

Further conceptual development of surge capacity was conducted by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and focused on the establishment of "surge hospitals." The JCAHO identified three types of surge hospitals:

- FACILITIES OF OPPORTUNITY, which are defined as nonmedical buildings which, because of their size or proximity to a medical center, can be adapted into surge hospitals

Planners may download the guide, *Surge Hospitals: Providing Safe Care in Emergencies,* from **www.jointcommission.org.**

- MOBILE MEDICAL FACILITIES, which are mobile surge hospitals based on tractor-trailer platforms with surgical and intensive care capabilities
- PORTABLE FACILITIES, which are mobile medical facilities that can be set up quickly and are fully equipped, self-contained, turnkey systems usually stored in a container system and based on military medical contingency planning.

All three types of contingencies were used and deployed in the aftermath of Hurricane Katrina.

Challenges to Successful ACS Planning and Implementation

While recent experiences with Hurricanes Katrina and Rita clearly demonstrate the need for ACSs to provide medical care at the time of an MCE, there are multiple impediments to successful ACS planning and establishment. The most significant challenges include:

- Lack of regional and State planning with clear delineation of responsibilities and authority

- The requirement that multiple groups work together who traditionally have not done so, including health care providers with conflicting institutional allegiances, hospitals, emergency managers, regional planners, and local and State health departments
- Lack of inducements to create, drill, and execute the plan
- Issues regarding health professional licensing; verification; and supervision, both intra- and interstate
- Funding issues.

Key Issues in ACS Planning

To respond effectively to an MCE, advance planning is critical. Community planners (from municipal agencies, including public safety, public health, and emergency management as well as representatives from local health care organizations or institutions) must conceive of a plan for how the ACSs would deliver wide-ranging medical services to the population in need. This planning must be done with existing health care facilities (hospitals, outpatient clinics, and multispecialty group offices) and home care entities. Planners must delineate the specific medical functions and treatment objectives that the ACS facility would need to accomplish.

This approach assumes that an organized mechanism exists for triage of patients into high-acuity, moderate-acuity, low-acuity, and expectant/expired categories, so that patient needs are matched with available medical resources. The division of patients also must identify those patients for whom no manner of medical intervention is likely to result in a positive outcome and are therefore candidates for palliative care. Such planning also assumes that the most severely ill or injured high-acuity patients can receive medical care commensurate only with what would be expected within the setting of a hospital facility or an ACS that is outfitted to serve as an acute care hospital, which is unlikely.

The biggest challenge, however, is the fact that most communities will not be able to procure the amount and complexity of resources or the level of staffing required to extend hospital facilities into designated ACSs. For this reason, most ACSs will be located in "buildings of convenience." It is imperative for planners to establish clear operational definitions of what can and cannot be accomplished in the setting of an ACS.

Getting Started with an ACS
WHAT TO DO?
The most important step in attempting to overcome the challenges to successful ACS planning and implementation is to begin the planning process.
HOW TO DO IT?
A single individual or group must recognize that planning for ACS is a mandatory part of all hazards preparedness and identify or establish an administrative structure to begin the planning process.
WHO SHOULD BE INVOLVED?
Participants in this process should include emergency managers, community planners, public health (local and State), public safety, emergency medical services (EMS), area health care facilities, and health care providers.

The development of ACS plans will not be accomplished in a vacuum. Key planning issues to consider include the following:

- Local health care and emergency management systems all should be involved not only in the ACS planning process but in the commitment of financial support as well.

- Any regional health care alliance that is formed to plan for response to disasters must integrate ACSs into their operating plans. As such, these facilities must fit within the broader spectrum of medical and health care incident management. Community planners must identify the logistical support necessary for establishing such ACSs.

- Community planners should identify and create protocol-driven patient management objectives, based on assumptions about the types of patients that would be treated in such ACS facilities.

Different Uses of an ACS
ACS facilities ultimately may be developed to serve different purposes depending on the circumstances requiring their use. An ACS might be designed to serve as one of the following: o **A primary triage point**, helping decide which patients require hospitalization, can be managed at home, might benefit from observational care and minimal interventions available at the ACS, or require palliative care which also might be available at an ACS. Such a facility might be reasonably expected to cohort a group of patients who were exposed to certain infectious agents but do not need more than continued observation and minimal, if any, medical intervention. o **A community-focused ambulatory care clinic** that serves as a point of distribution for medications, vaccinations, or other medical interventions that must be delivered to a wide population. o **A low-acuity patient care site** to permit the offloading of stable patients from hospitals to enhance their internal patient care capability or as primary sites for the care of stable low-acuity patients.

Key Issues in ACS Establishment and Operation

The successful establishment and operation of an ACS is, by its very nature, a complex undertaking, with a variety of issues to be addressed. As is the case with all aspects of preparedness, these issues are best vetted and investigated well before an event that necessitates their implementation. Several of the points discussed below also will apply to the situation where a locale is not setting up its own ACS but rather is operating in a *supportive role* of a Federal Medical Station (FMS) ACS.

FMSs are designed to provide surge medical capacity (equipment, material, pharmaceuticals) to communities overwhelmed by mass casualties. They can provide rapidly deployable health and medical care to those patients who have nonacute medical, mental health, or other health-related needs that cannot be accommodated or provided for in a general shelter population. They also provide health and medical care for patients with needs such as:

- Conditions that require observation, assessment, or maintenance.
- Chronic conditions which require assistance with the activities of daily living but do not require hospitalization.
- Medications and vital sign monitoring, particularly for patients who are unable to do so at home.

"Ownership," command, and control of the ACS

The single most important issue for the successful establishment of an ACS is the determination of ownership, command, and control of the ACS. These issues should be decided at a local or regional (as opposed to institutional) level and must involve the identification of the individual(s) with the authority to decide whether, when, and where an ACS should be opened and the authority to operate the site.

The most effective way to make such decisions is to use and build on the organizational and governance structure that is already functioning in the region or State. The administrative structure for operation of an ACS should follow the basic concepts of the hospital incident command system discussed earlier in this guide and reviewed below.

The Hospital Emergency Incident Command System (HEICS) was developed in the early 1990s to provide an emergency management system for hospitals for use during a medical disaster, but the concept has been adapted to other areas of emergency response as well and certainly lends itself to providing structure and organization to the operation of an ACS. Indeed, many ACSs that were set up during Hurricanes Katrina and Rita used the basic concepts of HEICS, which were then altered to fit the unique aspects of the ACS. HEICS, now known as HICS, provides an emergency management system that provides a logical, flexible management structure with a clear chain of command and is compliant with the National Incident Management System.

Hospital Incident Command System* Management Structure

The Incident Command Section provides overall coordination of the response and is the central communication point.

The Operations Section is responsible for clinical duties including triage and treatment and directs all patient care resources.

The Logistics Section is responsible for providing facilities; services, including food service and communications; and materials.

The Planning Section determines and provides for the achievement of each medical objective and manages human resources.

Finance and Administration is responsible for maintaining accounting records, issuing purchase orders, and stressing facility wide documentation.

*Hospital Incident Command System is the new name for the revised Hospital Emergency Incident Command System. Planners are encouraged to view the updates posted at **www.emsa.ca.gov** .

Recommended Approaches to the ACS Planning Process

1. Ensure that all communities (local and regional) have an integrated MCE plan in place to provide for expansion of health care services to ACSs when health care providers and institutions are overwhelmed.

2. Convene a planning and implementation committee comprised, at a minimum, of emergency managers, planners, public health departments, health care providers and institutions, local and regional government representatives, and appropriate private partners.

3. Ensure that a concept of operations (CONOPS) document is prepared to define in advance the anticipated role that the ACS facility will serve.

4. Identify and assess potential sites for implementation of an ACS prior to an incident. Whenever possible, put in place agreements to permit such use.

5. Obtain, stockpile, and store supplies and equipment sufficient to meet the anticipated role for the ACS as defined in the CONOPS in a fashion that will permit rapid deployment to a selected site.

6. Prepare a plan for obtaining or stockpiling pharmaceuticals sufficient to meet the anticipated role for the ACS as defined in the CONOPS.

7. Prepare a plan for personnel staffing sufficient to meet the anticipated role for the ACS as defined in the CONOPS.

8. Anticipate and plan for operational and logistic support of the ACS, including, at a minimum: communications, internal and external with redundancy, security, transport of patients to and from the ACS, mechanisms for documentation of services, food services, resupply, staff rotation and rest, laundry services, and storage capacity.

Any ACS should be operationally integrated into a community-wide, unified command. It also should be integrated into the local Health Alert Network, which will allow for consistent approaches of care to the various medical problems that will be encountered (e.g., pandemic influenza, acute radiation syndrome).

HEALTH ALERT NETWORK (HAN)

The HAN is a nationwide program that establishes the communications, information, distance learning, and organizational infrastructure for a new level of defense against health threats. The HAN will link local health departments to one another and to other organizations critical for preparedness and response. The Centers for Disease Control and Prevention (CDC) is leading HAN development, working in partnership with other health organizations. Currently, HAN is providing health information and the infrastructure to support the dissemination of that information at the State and local levels. See **www.phppo.cdc.gov/han.**

Decision to establish and open an ACS

This usually will be collaboration among local emergency managers, regional planners, health care workers responsible for operating the facility, county and State health officials, and any institutions that will participate in the staffing or logistical support of the ACS.

Scope of care to be delivered and patient population to be served

Although the target patient population and scope of care to be delivered at an ACS may be event specific, some general guidelines are outlined in Table 1. Depending on the specific situation, the ACS may be used to:

- Provide delivery of ambulatory or chronic care
- Offload less ill patients from nearby hospitals, thereby increasing the hospitals' surge capacity
- Provide primary victim care at a standard appropriate for the austere situation
- Provide quarantine, sequestration, or cohorting of "exposed" patients
- Provide palliative care.

Table 1. ACS Scope of Care

Scope of Care	Objectives of ACS Implementation	Scenario Type	Facility Type
1. Delivery of ambulatory/chronic care/special medical needs	Decompression of medical shelters; decompression of emergency departments	All	ACS
2. Receiving site for hospital discharge patients (non-oxygen dependent)	Decompression of acute care hospital inpatient beds	All	ACS
3. Inpatient care for moderate-acuity (non-oxygen-dependent) patients	Used instead of acute care hospital inpatient beds	All	ACS
4. Sequestration/ cohorting of "exposed" patient population	Protection of acute care hospitals from exposure to potentially infectious patients	Pandemic influenza Bio event	Home ACS
5. Delivery of palliative care	Used instead of acute care hospital inpatient beds	All	Home ACS

One of the key decision points in the delivery of out-of-hospital care at an ACS is the ability to provide oxygen and respiratory therapy, particularly the ability to provide mechanical ventilation. The logistics and expense of sustaining oxygen delivery systems in an ACS setting, however, is extremely complex and prohibitively expensive. The exception to this may be the use of nursing homes and long-term care facilities in the role of alternative care facilities, given their existing medical gas supply.

Table 2. Buildings of convenience

Adult detention facilities	Military facilities
Aircraft hangers	National Guard armories
Churches	Same-day surgical centers/clinics
Community/recreation centers	Schools
Convalescent care facilities	Shuttered hospitals
Fairgrounds	Sports facilities/stadiums
Government buildings	Trailers/tents (military or other)
Hotels/motels	
Meeting halls	

Tentative sites are best identified in advance, and the mechanism of approval for use as an ACS should be investigated. As a rule, permission to use municipal buildings will be easier to obtain, and it will be easier to get MOUs to use existing staff members. Possible structures of opportunity are outlined in Table 2. Each will have advantages and disadvantages, depending on the type of MCE.

Although site selection is usually a local function, State partners should be asked early in the planning process whether potential shelters or ACSs have been designated at a State or regional level. If the ACS must supply ambulatory patient care, it may help to locate it near a victim shelter to support victims with chronic medical needs in that shelter. A list of requirements for an ACS has been converted to a matrix tool to assist with ACS site selection (in the table at the end of this chapter).

ACS SELECTION TOOL

The selection of a potential building to use as an ACS is an imprecise science and may vary based on the nature of the event. Using a consensus process, a group of hospital engineers, facility personnel, and health care providers developed and refined a list of infrastructure requirements for ACSs based on some initial work by the Department of Defense. These characteristics were then converted into a matrix tool to assist in site selection with each characteristic being assigned a relative weight from 0 to 5 (see the table at the end of this chapter). The values for each structure under consideration then can be added up giving a relative rank order of the suitability of each building. This tool is most appropriately used in advance of any event, so a list of potential buildings for use as ACSs can be developed and maintained. The tool is available at **http://www.ahrq.gov/research/altsites.htm**.

Supplies and equipment

Another issue that requires advance planning is the availability of supplies for the adequate operation of an ACS. Routine supply chains will be stressed or not operational during an MCE

of any magnitude or duration. Although the degree of need for certain supplies may be event specific (e.g., increased need for masks during a pandemic), the need for many basic supplies can be accurately forecasted. This is especially true for basic durable medical equipment (cots, IV poles, wheelchairs, etc.). These supplies may be stored as portable caches, which then may be transported to the ACS for use.

Caches can vary from a bare minimum cache ("Level I") for institutional augmentation to the very complete cache ("Level III") as defined for the ACC by the Soldier and Biological Chemical Command (SBCCOM). Certain supplies have a limited shelf life and therefore will require product rotation or replacement. As noted above, the ability to supply supplemental oxygen to patients in the ACS is problematic, with no simple solution. Some potential partial solutions to this problem are offered below.

THE CHALLENGE OF SUPPLEMENTAL OXYGEN

The use of an ACS for patients who require supplemental oxygen is highly problematic from a logistical point of view. Options to supply supplemental oxygen run from a home fill unit (10L/min maximum, less than $1,000) to deployable oxygen generation or liquid oxygen storage and distribution system (multiple patients, high technology, upwards of $480,000). Given the variables of cost, general availability, ease of use and sustainability, the most promising options for supplying supplemental oxygen would be either a bank of 10L/min home fill units or a rack of eight interconnected "H" oxygen cylinders, each supplying 7,000 liters of oxygen for a cost of approximately $13,000. Even this rack setup is severely limited, however, as the eight "H" cylinders could supply only 50 patients at 2 liters of oxygen per minute for 8 hours. This would necessitate three refills per 24-hour period and would require the rapid installation of a rudimentary gas distribution system. Support for ventilated patients would increase the rate of oxygen consumption significantly, further complicating this issue, and most likely would not be possible.

Sources:

Agency for Healthcare Research and Quality (AHRQ). *Rocky Mountain Regional Care Model for Bioterrorist Events: Locate Alternate Care Sites During an Emergency*. Available at **http://www.ahrq.gov/research/altsites.htm.** Accessed July 21, 2006.

Anthony Rizzo, USAF, MC, SFS, Chief, Operations Division NORAD-USNORTHCOM/SG. *Deployable Oxygen Solutions for FEMA* briefing. Available at **http://www.ahcpr.gov/research/altsites/alttool3.htm**.**(Appendix A).** Accessed July 21, 2006.

Caches of supplies should be stored in a modular fashion in units supporting 50–100 patients, allowing an ACS to be set up in stages.

Experience with the FMS for victims of Hurricane Katrina demonstrated the need for wheelchairs, walkers, and canes in an ACS. Local or regional resources are not likely to be sufficient to deal with this requirement. Questions also were raised about the appropriateness of

using cots in an ACS, which require staff members to bend over constantly and are inadequate for dealing with obese patients. This problem may be solved by purchasing oversized cots.

Expensive diagnostic and monitoring equipment (e.g., portable x-ray machines, ultrasounds, cardiac monitors), in most cases, will be beyond the scope of an ACS. Advances in point-of-care clinical laboratory testing, however, may allow some basic laboratory tests to be performed at an ACS.

Supply Caches

The following sources provide excellent guidance for planners in terms of establishing supply caches for different levels of ACS:

- Agency for Healthcare Research and Quality. *Rocky Mountain Regional Care Model for Bioterrorist Events: Locate Alternate Care Sites During an Emergency*. Available at **http://www.ahrq.gov/research/altsites.htm.** Accessed July 21, 2006.
- Hick JL, Hanfling D, Burstein JL, DeAtely C, Barbisch D, Bogdan G, Cantrill S. Healthcare facility and community strategies for patient care surge capacity. *Annals of Emergency Medicine*. 2004;44:253–261.
- Skidmore S, Wall W, Church J. *Modular Emergency Medical System Concept of Operation for the Acute Care Center: Mass Casualty Strategy for a Biological Terror Incident*. Soldier and Biological Chemical Command; May 2003. Available at **http://www.nnemmrs.org/documents**. Accessed June 12, 2006.

Pharmaceuticals

Pharmaceuticals are an especially problematic issue, as they require a degree of environmental storage, stock rotation, and legal control. In certain events, the Strategic National Stockpile may be of assistance in supplying pharmaceuticals, but this is not guaranteed and should not be depended on as a sole solution. Pharmaceuticals fall into two major categories: those needed for the acute care of a patient and those needed for chronic diseases and ongoing maintenance of a patient's current condition. Basic pharmaceuticals will be required for the management of a wide variety of medical conditions within the context of the ACS's limited scope of practice.

The specific categories of medications that should be available include those related to:

- Acute respiratory therapy
- Acute hemodynamic support
- Pain control and anxiolysis
- Antibiotic coverage
- Behavioral health

- Chronic disease management.

Patients requiring drugs used for Advanced Cardiac Life Support response, as well as those used in the management of worsening respiratory status, necessarily will be transferred from the ACS to a hospital inpatient setting, if at all possible.

Although it might be anticipated that stable patients, even those being observed after a possible exposure, would have few specific needs, most such patients have existing medical conditions that require ongoing pharmaceutical therapy. Medications for the care of chronic diseases and conditions all will be necessary. Planners must address in advance the issues of obtaining, storing, controlling, and dispensing both controlled and noncontrolled medications.

Staffing

Many aspects of staffing may depend on the specific type of event. Medical staff volunteers probably would be more abundant for a geographically limited noninfectious MCE, for example, than for a geographically generalized (pandemic) infectious MCE. Even in situations where there will be adequate staffing, the issues of verification, credentialing, supervision, and command and control will exist. Development of the Emergency Systems for Advance Registration of Volunteer Health Professionals (ESAR-VHP) will help address these issues. The ESAR-VHP structure of verified health professional credential levels increases health system personnel capacity by providing a standardized way to identify significant numbers of credential-verified health professionals across a State. In addition to providing State-based advance registration, verification, and credentialing of medical volunteers, the system should enable interstate sharing of volunteers. Further development of the Medical Reserve Corps (MRC), with their local units of medical volunteers, including paramedics if available, also may help address some of these staffing issues. In 2005, more than 1,500 MRC members were willing to deploy outside their local jurisdiction on optional missions to hurricane-affected areas with their state agencies, the American Red Cross, and HHS.

Although some staffing levels for ACSs can be proposed in advance (see Table 3, next page), unique staffing requirements tend to be event and population specific. The level of patient acuity certainly will have an impact on staffing needs.

One option is that in situations in which the ACS is used to decompress hospitals, only those hospitals that contribute staffing would be allowed to send patients to the ACS. Planners should consider other staffing options, including the following:

REGIONAL HOSPITAL ALLIANCES could designate in advance a small number of key staff members, including pharmacists, laboratory workers (to be responsible for the point-of-care testing), respiratory therapists, and administrators, to help support ACS operations. Given the aggregate number of allied health professionals employed per hospital, recruitment of such a

relatively small number of staff members should not be overly burdensome.

A SINGLE HOSPITAL may adopt an ACS and in so doing may be able to provide staffing for an entire ACS.

THE FAITH-BASED COMMUNITY AND COMMUNITY HEALTH WORKERS also may be viable sources of volunteers.

Moreover, in a geographically limited MCE, where there is a large possibility of volunteers from outside the impacted area, academic medical centers may be a source of teams of health care workers who could assist with staffing needs. This concept could be further refined through the establishment of partnerships with centers outside of the local geographic area in advance of an event. Tapping into the administrative structures of large, geographically diverse health care systems also could assist in meeting staffing needs.

Table 3. Potential Staffing for a 50-bed ACS per 12 Hours

PER 12 HOUR SHIFT: 32.5

- Physician [1]
- Physician Extender (PA/NP) [1]
- RNs or RNs/LPNs [6]
- Health Technicians [4]
- Unit Secretaries [2]
- Respiratory Therapist [1]
- Case Manager [1]
- Social Worker [1]
- Housekeepers [2]
- Lab [1]
- Medical Assistant/ Phlebotomy [1]
- Food Service [2]
- Chaplain/Pastoral [1]
- Day Care/Pet Care
- Volunteers [4]
- Engineering/ Maintenance [0.25]
- Biomed [0.25]
- Security [2]
- Patient Transporters [2]

Despite having staff members from distinct and separate health care organizations, there are many more similarities than differences evident in the delivery of medical care, particularly in any given region. Planners need to establish guidelines and protocols in advance for the care and management of patients treated in an ACS. These guidelines should help to minimize the difficulties inherent in bringing a new team of health care professionals to work together for the first time.

Other Staffing-related Issues to Consider

- The provision of housing for the staff may be an issue.
- Identification of staff members (and patients and their family members) becomes an issue in the rapidly changing environment of an ACS and should be addressed by providing a name badge system that could be as simple as stick-on nametags or as complicated as a site-generated photo ID.
- It may be appropriate to negotiate overtime contracts in advance in cases where municipal-owned buildings are to be used as ACSs with municipal workers providing support staffing.

Operational support

Actual operation of an ACS will require a host of support services, including meals, sanitary services, infrastructure maintenance, and security. Although some of these needs will be driven by the nature of the event, much planning can and should be done in advance for many of these support issues.

Documentation of care

Given the extraordinary conditions that will exist to require the use of ACSs for patient care delivery, only modest means for patient care documentation should be expected to be used. Electronic medical records are not likely to be available or practicable, particularly given the learning curve associated with their use and the dependence on technology that may not be operable. Rather, simple paper-based charting will be required. Forms for patient records (including nursing notes and flow sheets), patient tracking and discharge planning should be prepared in advance; there should be an adequate supply of such forms, as well as clipboards and pens.

SECURITY ISSUES

In the chaos and confusion that accompany any large-scale MCE, security assumes an increased level of importance, especially since law enforcement resources will be severely taxed. To this end, planners must develop robust security plans. It is helpful if security personnel have previous experience in dealing with patients, especially those with behavior disorders. The best potential source of security staff would be off-duty hospital security personnel, but these individuals may not be available. Other potential sources would include on- or off-duty police officers, activated members of the National Guard, or volunteers.

Communications

Reliable communications will be required among the ACS and nearby health institutions, EMS providers, unified command, law enforcement, suppliers, staff members, and the public. Most MCEs, however, result in communication system failures, highlighting the need for redundant communication capability, including land lines, cellular phones, and local and regional radio communication (including HAM radios). Advance planning and selection of potential ACSs may facilitate the establishment of land line communication.

Relations with EMS

Any ACS will be dependent on local EMS for transport of patients to and from higher levels of care and to assist with patient dispositions. For this reason, local EMS providers should be part of the ACS planning process.

Rules and policies for operation

It became clear during the operation of the FMSs in the aftermath of Hurricanes Katrina and Rita that rules of behavior for patients, caregivers, and visitors were necessary for the smooth operation of the ACSs. ACS planning should include the establishment of such a set of rules as well as operating procedures.

Planners are referred to the following 2006 HHS document as an excellent reference for sample forms (emergency intake, patient assessment, etc.), sample rules, and operating procedures: *After Action Review of Federal Medical Station(FMS) Operations During Hurricanes Katrina and Rita.*

Operating procedures should address incident command, staffing, criteria for admission, discharge and transfer, clinical roles and responsibilities, infection control, pharmacy and medication control, safety, security, supplies, finances, documentation, staff housing, housekeeping, food services, and other areas unique to the event.

Development of an exit strategy

Part of the successful operation of an ACS is the decision of when to close the facility. Criteria for disengaging the ACS should be established as part of the planning process. The actual decision to close the facility should be made in concert with the local emergency managers and local or State health officials.

Exercising the ACS

Plans for a regional ACS can be fully vetted only through exercises. Ideally, these exercises should include the ACS as a stand-alone facility and use the ACS support components to assist with the establishment and operation of an FMS. Funding for these exercises can be supported with Health Resources and Services Administration 2006 bioterrorism grants and Urban Area Security Initiative funding.

Lessons from Case Studies of ACSs

The 2005 hurricane season dealt the health care system of the Gulf Coast of the United States an unprecedented blow. The enormous number of patients and evacuees in the aftermath of Hurricanes Katrina and Rita overwhelmed local health care resources of the Gulf Coast of the United States. This afforded emergency managers and clinicians an excellent opportunity to witness firsthand the operation of alternative medical care facilities.

The near total destruction of the local health care system of the Gulf Coast region and especially the New Orleans metropolitan area made it necessary to evacuate thousands of healthy evacuees, acute medical patients, and persons with chronic medical conditions and special needs to unaffected areas. The concept of receiving casualties in areas which were otherwise unaffected by the original disaster has been described as *evacuee surge capacity*. This term differentiates it from the intrinsic surge capacity resources of the impacted location. It is a subtle distinction, but it takes into account that the receiving facilities at least have not suffered a blow to their infrastructures. Also, from an emergency planning standpoint, it encompasses the principle of distributing patients to several different receiving areas so as not to overwhelm any single facility.

The strategy of transferring patients away from the affected Gulf Coast area was used extensively in the late summer of 2005. Large ACSs were established in surrounding States, and smaller facilities were set up to accept evacuees throughout the United States. A number of clinicians and officials involved in EMS and emergency management at several of the locations where ACSs were established after Hurricanes Katrina and Rita were interviewed for this planning guide.

Lessons Learned: Key Areas to Consider in ACS Planning

OPERATIONS

- Regional planning is important. Ensure that patients are distributed across the State(s) efficiently and appropriately.
- Security makes patients and staff members feel safe and keeps out troublemakers. Having uniformed people on site, even Reserve Officer Training Corps (ROTC) cadets, makes a real difference.
- There are distinct advantages to setting up an ACS near a college or university. For example, it provides extra manpower (e.g., football team) to carry patients, set up equipment, etc.

MEDICAL

- Plans must be made to segregate individuals with special medical needs from the general population.
- Facilities should be laid out in an organized fashion. A grid system allows clinicians to make “rounds” and know exactly where to find a patient (e.g., bed A4).

STAFFING

- There should be extensive use and coordination of volunteers.
- Acknowledge that volunteers may not want to do certain tasks (e.g., colostomy care, diaper changes). Establish who is going to do what.
- Legal and jurisdictional issues will need to be addressed.
- It is important to develop an Incident Command System that can help avoid “turf battles” between employees of different health systems who are staffing the same facility.

LOGISTICS

- Public health issues are critical (e.g., safe food and water, sanitation, latrine resources).

SPECIAL NEEDS SHELTER CASE STUDY

Converting a Veterinary Hospital in College Station, TX

In anticipation of Hurricane Rita, emergency planners and officials from the Texas A&M Health Sciences Center converted the Large-Animal Hospital at the College of Veterinary Medicine and Biomedical Sciences into a medical facility to house special needs patients and their caregivers from Houston and Galveston. Officials at the University previously had worked out a hypothetical plan to convert the animal hospital into just such a surge hospital during times of scarce medical resources. The facility was quickly cleaned and brought online to receive patients and remained operational for 1 week.

A type III Federal Medical Station (later redesigned as a Level IV FMS) was dispatched through an HHS-CDC-coordinated effort; this addition supplied two 250-bed caches of equipment, which increased the capacity to 1,081 beds.

U.S. Public Health Service staff eventually assumed medical control of the facility. In total, the facility took care of more than 350 patients (many of whom were ventilator or dialysis dependent) and housed more than 650 people (including patients' caregivers). This facility was instrumental in allowing the pressure to be taken off the local acute care facility, St. Joseph Hospital.

Lessons learned from this experience include the following:

- Veterinary hospitals can offer significant advantages in planning for surge capacity due to preexisting facilities (e.g., water, lighting, medical gas pipelines).
- If such vet hospitals are associated with a university medical system, they are easier to integrate into the overall medical system.
- It is important to have a plan for conversion to human use, including plans for care of animals.

MOBILE MEDICAL FACILITIES CASE STUDY

Mobile Field Hospital in Waveland, MS

During Hurricane Katrina, the Hancock County Medical Center was completely incapacitated, with mud covering the entire first floor. The State of Mississippi worked with HHS and the State of North Carolina through the Emergency Management Assistance Compact (EMAC) to deploy a mobile medical field hospital. The hospital was comprised of the North Carolina State Medical Assistance Team (SMAT) together with a tractor trailer from the Carolinas Medical Center in Charlotte.

In addition to the North Carolina SMAT, two Disaster Medical Assistance Teams from NDMS and a U.S. Air Force Expeditionary Medical Support system (EMED + 25) were among the many field medicine service providers rendering medical care to local residents of Hancock County. The North Carolina SMAT conducted medical operations for more than 7 weeks and treated more than 7,500 patients, including some surgeries. More than 500 health care professionals from North Carolina were deployed from all over the State to staff this field unit during the 2-month deployment.

Lessons learned from this experience include the following:

- The use of a self-contained mobile medical facility can be a significant asset in an austere environment with essentially no infrastructure; however, that asset must be deployed with "wraparound" logistics and must be truly self-sufficient to avoid becoming part of the burden on the requesting community. Logistical challenges diminished the intended capability of the tractor trailer medical unit. The prototypical unit proved to be less useful than originally planned and more than 95 percent of the patients were actually treated outside the unit in a tent style environment similar to Disaster Management Assistance Teams or the EMED + 25.

- A heliport was set up given the fact that the main ground evacuation route was underwater. Air medical services played an important role in this instance, highlighting the need to include such services in planning efforts.

- Issues of licensing, jurisdiction, malpractice, and reciprocity need to be addressed at the highest levels of government for the successful widespread use of similar mobile medical assets. EMACs give protection to assets owned by a State, but similar protection for non-State entities is less clear. Local medical assets that wish to deploy outside their jurisdiction must fall in line with the State system of emergency management to ensure proper asset placement and liability protection.

Converting Public Buildings to ACSs: Examples from Hurricane Katrina

During the response to Hurricane Katrina, there were many instances of converting public buildings to an ACS: Some of these are described below:

Reliant Arena Medical Clinic, Houston – Many thousands of evacuees from the New Orleans Super Dome and more than 700 patients from New Orleans hospitals were evacuated to Reliant City Astrodome in Houston. Fire department EMS personnel and clinicians from Baylor College of Medicine and the Harris County Hospital district oversaw medical operations at the Astrodome and established the Reliant Arena Medical Clinic. A triage system was set up to avoid persons directly dialing the 911 system and potentially overwhelming the Houston hospital system.

Convention Center Evacuee Medical Clinic, Houston – After the Astrodome reached capacity, a shelter was created at the George R. Brown Convention Center. In addition to health care professionals from the University of Texas Science Center at Houston, the clinic was staffed with volunteers, such as retired physicians from the Harris County Medical Reserve Corps.

Reunion Arena and Dallas Convention Center (DCC) Medical Unit, Dallas – Reunion Arena in Dallas was opened to accommodate more than 700 evacuees. As the Arena filled to capacity, the DCC was opened as a large shelter which housed 900-1,800 evacuees a night. A small aid station and standing ambulance were set up at the Reunion Arena, but a larger and more substantial medical clinic was set up at the DCC, encompassing more than 8,200 square feet of space. This clinic was administered by the University of Texas (UT) Southwestern Medical Center at Dallas and staffed by UT staff members as well as numerous volunteers.

Surge Hospital, Louisiana State University (LSU) Basketball Arena, Baton Rouge—The Louisiana Department of Health worked with LSU to establish an 800+bed surge hospital at the university's basketball arena and a special needs shelter in an adjacent field house. The surge hospital was an acute care center and received patients who had been evacuated by helicopter and ambulance from the disaster area and other health care facilities. The center was staffed initially by local Baton Rouge physicians and evacuated health care professionals. Additional medical staff members included those from the Illinois Medical Emergency Response Team, the New Mexico Disaster Medical Assistance Team, the U.S. Public Health Service, and other health care volunteers.

Shelter for Special Needs Evacuees, Tyler, TX – The Northeast Texas Public Health District worked with UT at Tyler to set up a special needs shelter at the university to accommodate special needs patients. Medical operations were overseen by the Texas Medical Rangers and additional staff members provided by the UT Health Center at Tyler.

Operation Safe Haven, Evacuee Processing Station and Medical Clinic, Denver – Through an EMAC agreement between Colorado and New Orleans, more than 300 displaced evacuees from New Orleans were transported to the former Lowry Air Force Base in Denver, now a part of the Colorado Community College System (CCCS). Using an ICS, the mothballed buildings were prepared for the first planeload of 150 evacuees within 24 hours by volunteers from various agencies, the CCCS, local utility companies, and work crews from local prisons for the first plane load of 150 evacuees. Medical operations included an initial triage station and a clinic in the evacuee dormitory that operated for 4 days until the evacuees were integrated into local Denver health clinics.

Converting Public Buildings to ACS: Lessons from Hurricane Katrina

Planning and Coordination - The coordination of logistics, personnel, space, and supplies was critical in quickly responding to situational needs. This involved coordinating not just those entities responsible for responding to public health emergencies but included colleges, universities, and other potential community resources. Planners considered the order in which buildings would be used, first using a large arena with another site available if the numbers of evacuees became too large. In general, establishing personal relationships among various agencies and branches of government before a disaster strikes is critical to operating effectively during an MCE. A well-defined ICS was critical to operations in most localities; any agency or volunteer organization that is part of a response operation must have a basic understanding of ICS.

Public Health Considerations – Large arenas and convention centers are not equipped to handle evacuees for long periods of time. Shower facilities and other amenities are limited, and planners need to consider ways to address this in advance to avoid dangerous public health conditions. Medical staff needs for personnel hygiene also need to considered, such as showering and washing providers' clothing.

Security – In crowded conditions with large number of evacuees, it was important to maintain a sense of control and security. Uniformed staff members from area hospitals and other sources of security personnel were helpful in maintaining a sense of order. In some centers, National Guard soldiers and college ROTC cadets provided security. A safety officer should be designated to coordinate security activities in an ACS.

Transportation – Dedicated ambulances stationed at large evacuee centers helped to reduce demand on local EMS, which in turn freed the local EMS to respond to the community's needs and its 9-1-1 system. In general, the ACS clinical services helped to prevent local hospital systems from being overwhelmed.

Planning Medical Supplies, Pharmaceuticals, and Food Supplies – Small over-the-counter pharmacies in evacuee centers can help address simple pharmacy needs. Planners need to consider options and can coordinate with local pharmacies, hospitals, and local businesses to provide pharmaceuticals and other supplies. In Houston, arrangements were made with a chain pharmacy and local health care system to set up a full pharmacy at the ACS clinic. Ordering of purchased supplies should be handled through one person who is a designated purchasing authority to reduce potential confusion. Controlling access to the pharmacy and central supply is a critical security issue to be addressed in preplanning. In a sustained event, donor-fatigue can set in; mechanisms therefore should be considered for coordinating an uninterrupted supply chain and spreading the financial impact of volunteer supplies. In Baton Rouge, a resource book of each type of volunteered equipment was maintained so that providers had a ready source of information.

Shelter Expectations for Standards of Operation – Municipalities that contract out the management of shelters to outside organizations, such as ARC and faith- and community-based organizations, need to establish a set of standards for how shelters will be run. In Dallas, admitting and accommodating the immediate medical needs of evacuees at shelters became confusing due to varying admittance standards. In addition, planners need to consider how best to accommodate the existing homeless population in the shelters that are accepting incoming evacuees.

Credentialing – Credentialing is an important planning issue due to the potential for rogue clinics and medical providers to operate in the early stages of an event. Coordination of staff members under an ICS can address this issue. The U.S. Public Health Service addressed screening and credentialing of volunteer health care providers in Baton Rouge's ACS. The Texas Board of Medical Examiners was proactive in facilitating credentialing of out-of-State physicians.

Staff Considerations – Emergency physicians working to triage patients in ACS enabled the internists, pediatricians, and other primary care provides to focus on direct patient care. Volunteer health care providers play a valuable role, but clinic operations should not be run solely by a collection of volunteers. In addition, leaders must assess whether volunteers are being helpful and remove individuals who are not contributing to the overall mission. Some ACSs used a volunteer coordinator to manage the number of people who came to volunteer. In Dallas, a Web portal was set up to schedule physicians and coordinate staff members. Another consideration is that ACS leadership should have training in emergency management and disaster medicine; in some instances, it may become necessary to rotate some of the leadership positions to include personnel with more hospital administration experience. It is important to identify teams of personnel in anticipation of an event, allow them to evacuate their families, and provide shelter for the staff at an ACS, clinic, or hospital. Quiet and restricted access space needs to be provided to the health care staff so that lack of rest will not have a negative impact on the quality of care.

Patient Tracking and Documentation – Planners will need to consider how to use and coordinate patient-tracking data and coordinate across all agencies and organizations, such as the ARC, faith-based and community-based organizations and government-supported ACSs. Some of these organizations may have rules regarding information sharing that need to be considered in advance. A system for registering and tracking patients helps with making patient flow as efficient and orderly as possible. In Baton Rouge, a charge nurse station was established to track each patient and list providers that were on duty. A real-time census was performed every 8 hours to maintain accountability. In one center, a system of identification tags was useful for tracking patients.

Communications – In some ACS, HAM radio operators provided helpful supplemental communications. Having a number of handheld walkie-talkies also facilitated communications.

Patient Screening – Initial evaluation of evacuees is important to determine those people whose health conditions have deteriorated during travel to the ACS. A medical triage/evaluation station was used in Denver to conduct a more thorough screening of evacuees as they were being processed at the reception center.

Pediatric Populations – The involvement of pediatricians with experience in emergency management is helpful for planning for the numerous special considerations of pediatric evacuees. Early and accurate identification of children is crucial to alleviate confusion and additional suffering for families. It is important to keep in mind that children have special considerations in terms of decontamination and treatment due to the differences in their body size and metabolism.

Psychiatric Services – Evacuees from a major disaster have suffered a huge mental trauma. Some ACSs set up tents so that persons with psychiatric or stress issues could be attended to in a quiet and secluded location. The mental health of providers is important as well; in Baton Rouge, provisions were made for postincident debriefings and ongoing psychological support for health care providers.

Special Needs – Patients with special needs were directed to shelters that focused on their care instead of a regular shelter. In Texas, patients requiring special needs were redirected to a special needs shelter.

Accessibility – Some ACSs did not have wheelchair access and other accommodations for evacuees with disabilities. Temporary ramps and other adjustments can be made and need to be planned in advance.

Pets – A number of people arrived at shelters with their pets. Local animal shelters and animal response teams were used to register, evaluate, and house pets that arrived.

Table 4. ACS Selection Matrix

	Aircraft Hangers	Churches	Community/ Recreation Centers	Convales-cent Care Facilities	Convention Facilities	Fairgrounds	Government Buildings	Hotels/ /Motels	Meeting Halls	Military Facilities	National Guard Armories	Same Day Surgical Centers /Clinics	Schools	Sports Facilities/ Stadiums	Trailer/Tents (Military/ Other)	USAF	Other
Infrastructure																	
Door sizes adequate for gurneys																	
Floors																	
Loading dock																	
Parking for staff and visitors																	
Roof																	
Toilet facilities/showers (#)																	
Ventilation																	
Walls																	
Total Sspace and Layout																	
Auxiliary spaces (Rx, counselors, chapel)																	
Equipment/supply storage area																	
Family area																	
Food supply and prep area																	
Lab specimen handling area																	
Mortuary holding area																	
Patient decontamination areas																	
Pharmacy area																	
Staff areas																	
Utilities																	
Air conditioning																	
Electrical power (backup?)																	
Heating																	
Lighting																	
Refrigeration																	
Water (hot?)																	
Communication																	
Communication (# phones, local/long distance, intercom)																	
Two-way radio capability to main facility																	
Wired for IT and Internet access																	
Other Services																	
Ability to lock down facility																	
Accessibility/proximity to public transportation																	
Biohazard & other waste disposal																	
Laundry																	
Ownership/other uses during disaster																	
Oxygen delivery capability																	
Proximity to main hospital																	
Total Rating/Ranking (Largest # indicates best site)																	

Rating System: 5 = Equal to or same as hospital. 4 = Similar to that of a hospital, but has SOME limitations (e.g., quantity/condition). 3 = Similar to that of a hospital, but has some MAJOR limitations (e.g., quantity/condition). 2 = Not similar to that of a hospital, would take modifications to provide. 1 = Not similar to that of a hospital, would take MAJOR modifications to provided. 0 = Does not exist in this facility or is not applicable to this event.

Chapter VII. Palliative Care

AUTHORS

Anne M. Wilkinson, Ph.D., M.S., Co-lead Author, Senior Social Scientist, Palliative Care Policy Center, RAND Corporation

Marianne Matzo, Ph.D., APRN, BC, FAAN, Co-lead Author, Professor Palliative Care, University of Oklahoma College of Nursing

Maria Gatto, M.A., APRN, Director of Palliative Care, Bon Secours Health System

Joanne Lynn, M.D., M.A., M.S., Senior Natural Scientist, RAND Corporation

This chapter addresses the overarching mass casualty planning issue of how to provide optimal support for the dying, those facing life-limiting illness or injury, and those caring for them. It defines palliative care and explores ways in which this care can be integrated into initial planning and response (including health care facilities and alternative care sites) for catastrophic events. The goal of this section is to offer recommendations and considerations to help community planners address palliative care in areas such as decisionmaking, communication, supplies, resources, training, and personnel.

Palliative Care in the Context of a Mass Casualty Event (MCE): Issues and Recommendations At A Glance

MAJOR PALLIATIVE CARE-RELATED CHALLENGES

The provision of palliative care in the context of an MCE is a new component of disaster planning; there is a lack of understanding of how to incorporate community-based health care, mental health and social service professionals into planning efforts.

RECOMMENDATIONS FOR PLANNERS

Leadership

- Request aid of disaster planning leadership at a national level to engender a network of leaders in home health, palliative and hospice care, and long-term care that will be engaged in disaster planning.

Incorporating Palliative Care into MCE Planning

- Incorporate community-based long-term care and palliative care providers in all phases of planning, response, and recovery as integral members of the response team.
- Integrate specific planning for those likely not to live long in all established scenarios ("all-hazards approach") and established response plans. Include pediatric-specific palliative care issues in planning.

Training

- Incorporate palliative care training for MCE responders as an integral part of exercises, planning, and response, building on existing disaster planning and command and control structures.

Triage and Treatment Decisions

- Work with first responder personnel and local and regional disaster response planners (e.g., EMS, fire, police, departments of public health, community health clinics, local and regional governmental entities) to identify and develop clear guidelines and protocols to address issues of:
  - Triage
  - Alternative care sites (ACSs) for palliative care
  - What levels of care are to be delivered in what settings and by whom
  - Lines of authority and the clear identification of responsible personnel

Background

As was demonstrated with Hurricane Katrina, a catastrophic MCE overwhelms all available personnel and resources, both locally and regionally. Other large disasters (e.g., major hurricanes, "dirty bombs," pandemic influenza) also have the potential to overload the health care and social service systems and disrupt existing services to persons who were already seriously ill. Under conditions of massive injury and loss, and even in the face of overwhelming economic and social disruption, human beings will be called on to act humanely. In any disaster, the first priority will be to save all those who can be saved and to reestablish societal structure. In the event of a catastrophic MCE, it must be assumed that some people may survive the onset of the disaster but will have incurred such serious illness or injury that they will live only for a relatively short time. In addition, there will be vulnerable individuals (e.g., the elderly in the community, those sick in the hospital, those in nursing homes or group homes, the disabled, children) who were already ill with severe preexisting conditions and who may be negatively impacted by the resulting scarcity of resources. These individuals will suffer harm

disproportionately during or following a catastrophic MCE, because they may not be able to seek help, care for themselves, or pursue other survival and recovery strategies pursued by nonvulnerable populations.

> "When the needs of the many outweigh the needs of the one, what happens to the one?"
>
> Sally Phillips, R.N., Ph.D.,
> Agency for Healthcare Research and Quality

The goal of an organized and coordinated response to a catastrophic MCE should be to maximize the number of lives saved. At the same time, the goal also should be to provide the greatest comfort and minimize the physical and psychological suffering of those whose lives may be shortened as a result of either an immediate surge of patients or long-term exposure following a catastrophic event.

Palliative Care in the Context of an MCE

Under ordinary circumstances, about 1 to 2 percent of the population lives at home or in long-term care facilities with serious illness, facing the last phase of life.

Most scenarios of catastrophic MCEs would create sudden large numbers of fatally injured or critically ill short-term survivors that are at least a few orders of magnitude larger than the existing vulnerable populations. Depending on the event, some victims will last only a few weeks (e.g., pulmonary injury from airborne chemicals) and some may last for months (e.g., pandemic influenza). In many cases, those who survive the onset usually will live for some time – days to months – but will not be "expected to survive" due to the event itself or to the ensuring resource scarcities it creates. Initial identification of those who might fit into the "not expected to survive" category following a catastrophic MCE may include:

- Those exposed to the event who are expected to die over the course of weeks (e.g., those with radiation exposure)
- The "already existing" palliative care population (e.g., those already enrolled in hospice or receiving palliative care in acute care settings)
- Vulnerable patients (e.g., advanced illness patients in long-term care facilities) whose situation will be worsened due to scarcities associated with the event
- Patients who are triaged as a result of scarce resources.

Those who are not expected to survive cannot be simply abandoned or ignored; nor should they overwhelm hospitals and EMS. By including these populations in existing disaster and MCE preparation, response, and management, most communities can ensure humane palliative care for all affected by such disasters.

WHAT IS PALLIATIVE CARE? Aggressive management of symptoms and relief of suffering is what generally have come to be called "palliative care." The World Health Organization defines palliative care as "an approach which improves the quality of life of patients and their families facing life-threatening illness, through the prevention, assessment, and treatment of pain and other physical, psychosocial, and spiritual problems."

While it is important to understand what palliative care is, it is also important to specify what palliative care is not. Palliative care is not abandonment of the patient or reduction or elimination of treatment. Rather, it involves active treatment for symptom management and support to address the comfort of the patients and their families. Finally, the aggressive and appropriate treatment of pain and other symptoms is not euthanasia; nor does it "hasten death" (See Table 1). The application of palliative care principles in an MCE would include:

Table 1.

Palliative Care Is:	**Palliative Care Is *Not*:**
Evidence-based medical treatment Vigorous care of pain and symptoms throughout illness Care that patients want	Abandonment Euthanasia Hastening death

- Recognizing that initial prognostication may change if additional resources become available or if the situation deteriorates
- Honoring the humanity of the dying and those who serve them (whether loved ones, professionals, or strangers) by providing comfort and social, psychological, and spiritual support.

The National Consensus Project for Quality Palliative Care states that palliative care focuses on the relief of suffering and distress for people facing serious, life-limiting illness to help them and their families to have the best possible quality of life, regardless of the stage of the disease or the need for other therapies. Palliative care is both a philosophy of care and an organized, highly structured system for delivering care. Palliative care expands traditional disease-model medical treatments to include the goals of enhancing quality of life for patient and family, optimizing function, helping with decisionmaking, and providing opportunities for personal growth. As such, it can be delivered concurrently with life-prolonging care or as the main focus of care.

In an MCE, standards of care will require adaptation, unfamiliar personnel will be providing services, supplies will be strained, and command and control lines of authority will need to be established. In the interest of maximizing good outcomes for as many patients as possible, and at the very least, providing palliative care to all, treatment decisions will have to balance utilitarian notions against other ethical values, with medical effectiveness as a key determinant. Priority access to scarce resources, including structural and skilled personnel resources, may be applied or moved to those with the greatest potential for survival. Thus, services to those expected to die soon will fall more heavily on people who do not have substantial prior health experience and expertise.

WHAT SERVICES WILL BE NEEDED? The need to care

for the dying in times of calamity has been a small part of military medicine for a long time: chaplains and morphine are standard issue in field operations. In addition, the need to care for the dying in routine civilian medical care has come to the fore with the advent of large numbers of people who live with serious chronic illness and increasing disability for a substantial time before dying. Optimal support of potential survivors, the dying, and those whose vulnerability or frailty will be exacerbated by the event itself depends, in part, on having done a good job in planning for the inevitability of mass casualties throughout the time of the disaster. Crafting services that enable comfort, support longevity, and permit meaningful activities and relationships has been a major commitment of modern health care and consolidated under the label "palliative and supportive care."

> "The needs of those who may not survive catastrophic mass casualty events and the 'existing' vulnerable populations affected by the event should be incorporated into the planning, preparation, response, and recovery management systems of all regions and jurisdictions."
>
> Joint Commission on Accreditation of Healthcare Organizations, 2004

Major Palliative Care-related Challenges

Community planners face several significant challenges in the integration of palliative care services and personnel into MCE response planning. First, the provision of palliative care in the context of an MCE is a new component of disaster planning. As such, there is a dearth of literature and expertise on the subject of palliative care in the context of an MCE. Second, palliative care, long-term care, and home care are already resource poor; thus, identifying and securing funding for palliative care services will be a significant challenge. Third, there is a lack of understanding of the potential utility of incorporating community-based health care, mental health, and social service professionals into MCE response planning efforts – even by the professionals themselves. Finally, there is a significant lack of public awareness regarding the limitations of the health care system under austere circumstances.

Integration of Palliative Care Services into MCE Planning and Response

The palliative care service aspect of community preparedness is new to disaster planning in the United States. Without deliberate planning and direction, stocking up on appropriate supplies, and the development of realistic guidelines, supportive care services for the dying in MCEs will be erratic, inefficient, disruptive, and potentially indefensible as the basis for social reorganization after the disaster.

In most disaster scenarios, the priority concern is for survivors. In situations of the scale of the Oklahoma City or World Trade Center bombings, the local health and social service systems were able to respond to the relatively small numbers of seriously injured and modest disruptions to supportive care and community services for the existing population. In recent catastrophic events such

as Hurricane Katrina, however, there were massive disruptions to local and regional response capabilities, and large numbers of critically ill survivors with few resources to respond to them.

Recommended Actions and Potential Barriers

Leadership

Knowledgeable professionals and organizations (e.g., geriatricians, palliative care clinicians, long-term care providers and organizations, home health providers, hospice providers) should be integrated into current local, State, and regional disaster preparedness planning to bring the palliative care perspective.

Recommended actions include:

- Build on existing relationships
- Have State and local home health, hospice, and long-term care organizations and professional associations contact leaders in their State and regional-area disaster preparedness planning bodies to get involved in these activities/processes
- Have disaster planning leadership at a national level help to engender a network of leaders in home health, palliative and hospice care, and long-term care to be engaged in disaster planning, supported by appropriate research support and development expertise, so that promising ideas are quickly shared and tested and so that cross-region support is available in times of crisis.

As noted earlier, the barriers to implementing these recommendations involve the fact that palliative care, long-term care, and home care are already resource poor; there is a lack of understanding of the potential utility of incorporating community-based health care, mental health, and social service professionals into planning, even by the professionals themselves; and there is a dearth of literature and expertise on the subject.

Roles of palliative care services in various disaster scenarios

The role of palliative care and the resources needed to incorporate it into disaster response must be anticipated and fully incorporated into the current State and local disaster planning/training guidelines, protocols, and activities.

Recommended actions include:

- Base planning on lessons learned from previous disasters (including war)
- Establish practical measures of success in palliative care services in MCEs
- Conduct “gap analyses” and existing tabletop exercises of how to integrate palliative care services into local, State, and regional systems

- Integrate specific planning for those likely not to live long in all established scenarios ("all hazards approach") and established response plans (e.g., link to local, regional, and State plans and agencies such as joint field offices and local emergency planning committees; link to the National Incident Management System and the National Response Plan)

- Incorporate community-based long-term care and palliative care providers in all phases of planning, response, and recovery as integral members of the response team

- Encourage attention to the needs of those with expected short survival in all four phases of emergency management (prevention, preparation, response, recovery) and in all relevant settings (prehospital, acute care hospital, and ACS)

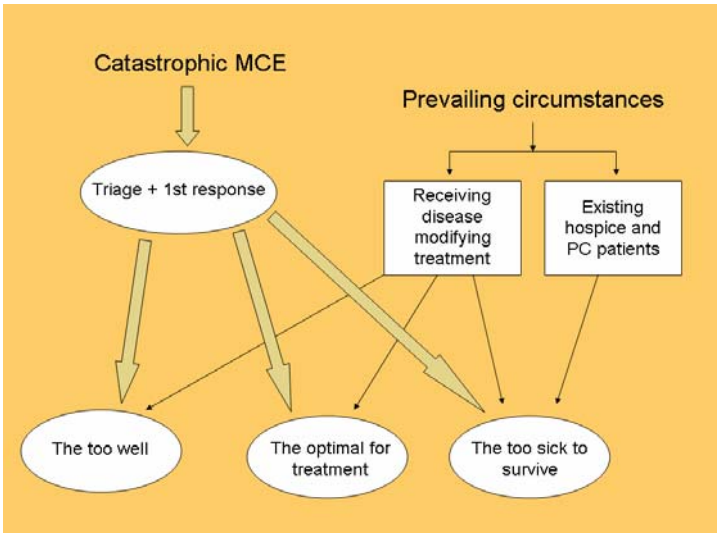
- Include pediatric-specific palliative care issues in all plans; failure to do so will hamper the ability of health care workers to move children into palliative care and develop guidelines for treating them.

The barriers to integrating palliative care services into MCE planning and response include substantial differences of perspective between palliative care providers and other planners; for example, there may be differences in perceptions between providing comfort and dignity and enhancing survival, even though these are often intertwined.

Triage and treatment decisions for those likely to die

A model of triage and response for victims of an MCE and the potential impacts on the prevailing health and social service system is depicted in Figure 1. Casualties would fall under three general categories: those unscathed by the event or too well to require emergency medical treatment, those too sick or injured to survive days or weeks, and those deemed appropriate for acute medical treatment and transport to an acute medical care facility. In addition, the existing "vulnerable" population likely will be affected by the event or the resulting disruption to their support system and may become palliative care patients due to the scarcity of resources. These patients also would be triaged over time to one or more of the casualty categories and casualty treatment sites, as their condition either worsens or improves.

Figure 1.
Catastrophic MCE: Triage and Response



In the event of a catastrophic MCE, casualties will be triaged at the site of the incident and again after transport to an ACS. Some will be deemed "likely to die" during the extreme circumstances of the catastrophe and

therefore will be triaged not to receive (or not to continue to receive) life-supporting treatment. For these casualties, death will be expected within a short period.

This reality poses substantial challenges for all involved, including the recognition that some people who might survive under other circumstances now will die. Given the usual focus of rescue in manageable disaster events, most patients, families, and emergency responders are likely to resist this designation and attempt to save all, potentially exacerbating an already overwhelmed medical care system. Thus, ACS and providers need to be identified and used for this population during catastrophic MCEs.

Recommended actions include:

- Build smooth links with supportive service organizations and personnel (e.g., home health, long-term care settings, hospice and palliative care providers) for those expected to die as part of catastrophic MCE response plans.
- Work with first responder personnel and local and regional disaster response planners (e.g., EMS, fire, police, departments of public health, community health clinics, local and regional governmental entities) to identify and develop clear guidelines and protocols to address issues of:
    - Triage
    - ACSs for palliative care
    - Who delivers treatment and support (e.g., spiritual, psychological) and how
    - What levels of care are to be delivered in what settings and by whom
    - Lines of authority and the clear identification of responsible personnel
    - Identification of location and use of stockpiles, supplies, and personal protection equipment
    - Training of providers for the provision of appropriate palliative care at all care treatment sites
- Disseminating guidebooks for the roles and activities involved
- Building strong support for triage and standards of care to respond to dire circumstances or scarce resources by redefining public expectations and training of palliative care and other health professionals. Actions would include:
    - Build in flexible methods of response for revising triage decisions and treatment when affected persons are doing better than expected
    - Build in psychological and ethical support for front-line responders
    - Expect anxiety and strong emotions, including mental illness and criminal activity, and having security and appropriate medications available

- Establish guidelines and protocols for "just-in-time" training and palliative service delivery of secondary providers at all treatment sites (e.g., the location of the event, alternative treatment sites, acute care hospitals, secondary referral sites such as nursing homes).

Barriers include public resistance to the overt rationing of health care resources. It is the role of the popular media and public health agencies to enhance public understanding regarding the limitations of the health care system under dire circumstances.

Medical supplies and equipment

Supply arrangements must be identified as part of the community planning effort not only to ensure that all potential palliative care supply sources are included, but to prevent multiple organizations from unknowingly relying on the same suppliers. Resources include people, equipment, food, and medical supplies. Mutual aid agreements should be made ahead of time with community agencies, other health care providers, and backup suppliers to ensure that resource needs for palliative care service delivery can be met.

Recommended actions include:

- Stockpile palliative care medications in each community for disaster response, including injectible morphine and dihydromorphone, injectible haloperidol, subcutaneous butterfly needles, tegaderm, antipyretics, steroids, and diuretics

- Plan for the needs of individuals chronically dependent on dialysis, ventilators, or other special supplies such as dressings, splints, syringes and oral droppers, incontinence supplies, beds or cushioned surfaces, and personal protective devices.

Barriers will include the need to stock supplies near the settings of service and preferably distant from hospitals and other sites of definitive care for survival. Long-term care facilities, inpatient hospice settings, or home nursing care offices are possibilities. Having controlled substances in strong lockboxes is probably most naturally sited at nursing homes, where systems are in place and storage of these drugs is already set up. Another option would be designated pharmacies. The effectiveness of these two options obviously would depend on their proximity to the disaster scene.

Training

Training in palliative care must occur prior to an MCE and will involve many layers of education and practice. Planners can incorporate experts now working with seriously chronically ill persons to be mobilized to serve those who might live and who are seriously ill. Thus, many of the physicians, nurses, and therapists who regularly serve the disabled or elderly will be needed to provide life-extending treatments. Planners could designate in advance certain leadership to remain in place and mobilize retired professionals and layperson volunteers.

Communities now provide Community Emergency Response Team training to engage citizens in community and family preparedness through public education, outreach, and training. Building on existing models of emergency response training, the planning team should identify a variety of training methodologies to incorporate palliative care services training for all disaster response members.

Cross-training of personnel from other areas (of expertise as well as from other areas of the country to provide "mutual aid" to the stressed community/region) will be important. In addition, laypeople should be recruited to serve (e.g., bus drivers, mail deliverers, anyone from the community who is willing to attend the training) due to the inevitable surge in demand for assistance that an MCE will engender. Moreover, education and training should be competency based, with programming specific to the individual's role in emergency response.

Recommended actions include the following:

- Incorporate palliative care training for first responders as an integral part of disaster and MCE preplanning and practice of events and response, which will build on existing disaster planning and command and control structures.
- Develop and implement competency-based evaluation and measurement.
- Identify cross-training opportunities of local and regional first responders along with integrated palliative care professionals.

PALLIATIVE CARE IS A NEW COMPONENT OF MCE PLANNING

Given that the issue of planning for palliative care during an MCE is a new component of disaster planning, both professional and layperson education is necessary and likely will take some time and persistence on the part of community planners. It may be appropriate to target retired health care professionals and volunteers for training. Both generic in-advance training and "just-in-time" curricula will need to be developed.

- Train all first responders to use oral and injectible morphine to manage pain and symptoms until licensed personnel are available to manage these symptoms. These medications should be stockpiled in the community as part of basic disaster planning, and the ways to locate and access it should be part of emergency response training.
- Provide personal protection and individual response training that first responders ordinarily receive to lay or professional individuals designated as responsible for providing care to those expected to die.
- Provide community and family member education regarding individual response actions and personal protection under various disaster scenarios or MCEs. Specifically, people will need to know how to protect themselves from contamination while still palliating symptoms for dying patients.

- Ensure that all first responders serving those who are expected to die soon know:
    - How to access the medication stockpile
    - The basics of psychosocial counseling and support for peer-to-peer support and provider/patient services in MCE scenarios.

Recruitment of professional providers and lay volunteers

With planning, a community could develop a reasonable reserve capacity for serving those who will live a short time before dying from a disaster. Palliative care, home health care, and long-term care professionals have valuable skills, but they are seldom called on for planning or for response during and after large-scale emergencies and disasters. Retired health care professionals often do not have a current skill set to be optimally useful in hospital settings, but their skills could be readily sufficient for medication and assessment in palliative care settings.

Furthermore, volunteering to help the dying has a long tradition among older persons and faith-based organizations.

Palliative care and long-term care professionals, retired health care professionals, and lay volunteers could be recruited and trained in their "defined roles" in disaster events in advance. Local palliative assistance teams could be recruited from a variety of practice settings (hospices, hospitals, long-term care, etc.) and disciplines (physicians, nurses, social workers, chaplains, etc.). These teams could be developed locally, potentially in conjunction with the Medical Reserve Corps (MRC). Potential groups that might serve as sponsors of these teams include senior centers, churches and synagogues, hospices, long-term care providers, nurses' organizations, senior organizations such as AARP, the National Hospice and Palliative Care Organization, and the American Academy of Hospice and Palliative Medicine as well as local hospitals, hospices, and palliative care programs.

These teams would be deployed to the site of an MCE, would assist with triaging victims as needed, and then would provide palliative care to patients deemed to be expectant (black tag) or in critical need of pain and symptom management. These rapid response teams would supplement, not replace, local palliative care services.

Recommended actions include the following:

- Create specialized rapid response teams made up of palliative care professionals and lay volunteers recruited and trained to serve as local, statewide, and regional providers.

- Consider incorporating these teams under the MRC, and the Community Response Team for deployment depending on the nature and scope of an incident.

- Consider extending the credentialing of palliative care disaster volunteers into the existing disaster response Federal/State and local legal/insurance systems in order to expand community capacity

through such mechanisms as the Emergency Systems for Advance Registration of Volunteer Healthcare Personnel (see page 87).

- Develop central registries of local health care providers and lay volunteers in the community who can be called on in the event of a disaster. Recruit these volunteers and providers into emergency response teams.

Barriers to implementing these recommendations include identifying sponsors and funding. In addition, it may be that some of the people who are dedicated to providing palliative care services in normal times may be unwilling to take on these roles under dire circumstances of a catastrophic MCE.

Mental health and spiritual care services

Dying, suffering, and death quite reasonably incite strong emotions and responses in patients, family members, professional caregivers, and bystanders. Reactions to disasters or MCEs will vary, and stress reactions can occur immediately following the disaster or many months later. In addition, because the medical community are the primary first responders in a catastrophic event or natural disaster, a broad-based mental health and counseling educational and service delivery plan (determined by the community that it will serve) for this group is essential. Local mental health providers, such as psychologists, chaplains, and health care providers, are a vital resource not only for the provision of palliative care services to mass casualties but also for the psychosocial support services that they can provide to the response providers. As the volume of patients triaged to palliative care expands, so will the strain of providing mass palliative care. These individuals also will need to have periodic emotional and psychological relief (e.g., by having them rotate to teams that are doing other types of work, such as delivering food); this would be important for the welfare and morale of the provider corps as a whole.

A number of behavioral, psychological, and spiritual response plans have been developed and should serve as the basis for the planning and delivery of these services in an MCE (see box).

Resources for Planners

- *Standing Together: An Emergency Planning Guide for America's Communities.* Joint Commission on Accreditation of Healthcare Organizations; 2005.
- *Preparing for the Psychological Consequences of Terrorism: A Public Health Strategy.* Institute of Medicine; 2003.
- *Mental Health All-Hazards Disaster Planning Guidance* (HHS Pub. No. SMA3839) and *Mental Health Response to Mass Violence and Terrorism: A Training Manual* (HHS Pub. No. SMA 3959). Both available at **http://nmhicstore.samhsa.gov/publications/browse.asp**. Accessed November 28, 2006.

While many individuals will die outright as a result of an MCE, there may be many more that are imminently dying or expected to die, in both the short and long terms. In times of crisis, many people look to clergy and other religious leaders for guidance. Spiritual counseling and support regarding the effects of the event should be made available to those not expected to survive and their families, as well as those expected to survive.

The potential post-traumatic stress and long-term psychological impacts of such disasters should be anticipated for those who are likely to survive and those experiencing the event but unharmed over the long term. Recommended actions include ensuring that response planning and activities include mental health and spiritual care services, especially for those not expected to survive and the first responders and health care professionals serving these populations. Mental health professionals and laypeople with training as well as pastoral and spiritual caregivers should be recruited and integrated into current disaster planning and response. Reluctance to integrate these nontraditional initial response professionals into catastrophic MCE planning and response could pose a barrier.

Communications and chain of command

Local and State leaders will have a great deal of influence over the individuals and community's expectations, understanding, and responses to an MCE. The management of the acute situation sets the tone for the ways society will respond. The accurate portrayal of ongoing efforts and successful forecasting of predictable events will enhance the credibility of authorities and diminish negative outcomes such as panic and chaos.

Two principal goals of communications in disaster events are (1) to establish and maintain a common operating picture and (2) to ensure accessibility and interoperability across jurisdictions and functional agencies. Establishing the role of communication in the integration of palliative care services in an MCE requires understanding how communications are transmitted and planning for alternative and backup communications and links.

Recommended actions include:

- Integrating information about service capacity in long-term care, home care, and hospice care and these professionals and laypersons into public education and disaster response training and activities
- Ensuring ways to communicate the need to transfer persons needing palliative care to designated ACSs as well as to transfer revised classification patients from palliative care treatment sites
- Ensuring ways for authorities to direct community members to palliative sites.

Planners should be aware that under the dire circumstances of a catastrophic MCE, training first responders either to classify as not expected to survive or to reclassify as expected to survive will not be an easy task. In addition, there will need to be clear lines of authority and responsibility for transfer to palliative care treatment sites.

Management of the dead

Recommended actions include the following:

- Pay attention to and be respectful of varying religious beliefs and approaches to body management.

- Do all that is possible to document the identity of the dead and the disposition of the body, for the benefit of the survivors. Deciding how to manage the dead has profound and long-lasting consequences for survivors and communities and is one of the most difficult features of disaster management. Immediately after a major disaster, the identification and disposal of human remains is typically handled by the local community.

  The remains typically pose no immediate health risk in the case of a natural disaster but may pose considerable risk in the case of an epidemic.

Disaster Mortuary Operational Response Teams (DMORTs) are composed of private citizens, each with a particular expertise, who are activated in the event of a disaster to deal with the myriad issues of victim identification and mortuary services. During an emergency response, DMORTs work under the guidance of local authorities, providing technical assistance and personnel to recover, identify, and process deceased victims.

- Address issues such as the supply of body bags, refrigerator trucks, ways to catalog bodies, and cremation with local funeral directors prior to an MCE. Communities may decide to purchase and stockpile body bags.

- Include the disaster mortuary operational response team (see box), public health planners, funeral directors, and medical examiners in disaster planning and drills.

Discussions with Key Informants

Given the fact that palliative care issues in the context of an MCE have not benefited from substantial prior work, the authors conducted telephone discussions with a sample of key informants from the fields of disaster planning and palliative care regarding the relevant issues and requirements for palliative care under a catastrophic MCE. General domains experts were asked to discuss:

1. How should decision guidelines for who receives this care be delivered? How do we handle large numbers of people expected to die and those already very sick or disabled?

2. What services/equipment/providers should be available? How should we use (or reuse) common supplies and equipment (e.g., gloves, gowns)?

3. What skills, materials, and memoranda of understanding are needed to shelter and/or evacuate people with supportive/palliative care needs?

4. What criteria would you suggest to allocate scarce and highly specialized clinical resources concerning supportive/palliative resources in the two scenarios?

5. What differences and similarities are there in the general considerations for the delivery of supportive/palliative care in an MCE such as bioterrorism and pandemic flu?

6. Is the current system given what is needed for shelter and evacuation sufficient, and if not, what if any additional support needs to be provided at the State and local levels?

7. Do you perceive a need for evacuation decisions for the supportive/palliative populations?

8. What are the vital skills for first responders to have?

9. How to maintain infection control and safe care environment?

10. How should we modify documentation standards to ensure enough information to support care and obtain legal protection without posing an undue administrative burden?

11. How to manage excessive deaths and the disposal of their bodies?

12. What are the clinical algorithms to make decisions regarding allocation of scarce resources?

13. What are the protocols for those who we need to help die comfortably?

14. What role does euthanasia play in disaster planning in supportive/palliative care? How do you communicate these tough decisions to the public?

Issues Related to Palliative Care in the Context of an MCE

1. All disaster planning and response should include plans for patients who will be unlikely to survive under catastrophic circumstances (e.g., events with mass casualties and/or long-term scarce resources), those already living with short prognosis in the community (since their existing services will be disrupted by the event), and those newly dying as a result of the event.

2. Most skilled professionals who usually serve those with fatal chronic illness may be diverted to active treatment settings to treat the medically salvageable, so first responders, less well-trained health care personnel, and potentially laypersons may have to fill in to care for the dying.

3. Health care personnel who are skilled in the principles of palliative care, long-term care, and hospice need to be involved in disaster response planning.

4. Specific palliative care supplies; disaster preparedness equipment; and health, mental health, and social service personnel (including volunteer laypersons) must be available and trained to use supplies such as narcotics and psychoactive drugs, dressings and splints, supportive surfaces, antipyretics or steroids, anti-infectives, and PPE.

5. Palliative care should be integrated into the case mix of ACSs or special locations: "palliative care" treatment sites should be established to treat those not expected to survive.

6. "First responders" and transport personnel should be trained in appropriate triage of patients so that palliative care patients do *not* overwhelm acute care hospitals.

7. The patients designated as "too sick to survive" initially should have their pain or other symptoms managed at the scene of the event and then should be transported to an ACS for continued palliative care services when transportation becomes available.

8. Locations ordinarily used to care for persons with eventually fatal chronic illnesses (e.g., nursing facilities, home health agencies) need to be ready to handle more severe complications. Plans should address the prospect of not transferring patients needing ventilator support if they are too sick to survive but prepared to provide appropriate palliative care services.

9. Preplanning for the provision of palliative care following a catastrophic event should not be seen as euthanasia or a cause of wrongful death. Managing the ethics interface requires thoughtful training, peer support, and extensive public education.

10. Long-term care providers and palliative care experts are encouraged to become part of all disaster planning and response activities.

11. The challenges of serving people who are frail or in need of palliative care prior to the disaster event should be addressed. At a minimum, this would include establishing a way to find and identify them.

12. There must be an honest recognition of death; this will be particularly difficult for certain groups such as children.

Chapter VIII. Influenza Pandemic Case Study

AUTHORS

Members of all writing teams contributed to this chapter.

Previous chapters highlighted important issues, concepts and strategies that need to be taken into consideration when preparing mass casualty event (MCE) response plans. This final chapter of the guide pulls much of that information together and applies it to a specific MCE case study: the hypothetical scenario of an influenza pandemic. This chapter provides an overview of the myriad challenges community planners need to consider when faced with the allocation of scarce resources as a result of a worldwide outbreak of influenza.

Overview

Preceding chapters of this report have discussed a broad range of issues that planners need to consider when developing their MCE preparedness and response plans. This chapter distills that information into a specific case study planning exercise. Specifically, the discussion in this chapter explores the implications of planning for a hypothetical MCE: that of an influenza pandemic. None has been "mitigated" to date.

An influenza pandemic would fall under the category of a developing impact MCE discussed in the introduction of this guide. A pandemic poses daunting challenges for planners in that it will occur in many areas simultaneously; there will not be a single disaster "site." Indeed, a pandemic will affect a large part of the population across the world and across all age groups, including the health care and emergency response workforce. The magnitude of the pandemic's impact will be felt in the large numbers of patients who quickly overwhelm hospitals and emergency departments and necessitate the allocation of scarce resources.

The National Strategy for Pandemic Influenza Implementation Plan is available at **www.whitehouse.gov/homeland/nspi_implementation.pdf.**

The Department of Health and Human Services Pandemic Influenza Plan is available at **www.hhs.gov/pandemicflu/plu/pdf.**

The National Strategy for Pandemic Influenza Implementation Plan puts the bulk of the planning and coordination responsibility on States and localities rather than the Federal Government. The ubiquitous nature of an influenza pandemic requires such shared responsibility. State and local health authorities and community planners, therefore, represent the front lines of pandemic preparedness response planning efforts.

Consistent with the messages from the other chapters of this guide, planners need to create their pandemic preparedness plans now, practice and exercise the plans and revise them when necessary. The range of issues that planners need to consider as they prepare for an event likely to place overwhelming demand not only on each community's health care system, but on essential services as well, is indeed staggering.

While an important component of all disaster responses, clear communications with the public assumes even greater prominence in pandemics. Effective and coordinated risk communication, domestically and internationally, before and during a pandemic, is essential to helping the public understand the rationale for recommended protective actions and in accepting the prioritization of scarce resources.

Communications activities include the identification of credible spokespersons at all levels of government to effectively coordinate and communicate helpful, informative messages in a timely manner. In the pre-pandemic period, for example, the public can be educated about infection control behaviors and the specific actions individuals likely will be asked to take during a pandemic, such as self-isolation and protection of others, if they themselves become ill with the flu.

The National Governors Association primer for Governors and Senior State Officials, *Preparing for a Pandemic Influenza* notes that "Managing during a pandemic--with considerable loss of staff, depleted resources, a struggling economy and a nervous public--will be a considerable challenge to local and State leadership."

The NGA primer is available at **www.nga.org**

Preparedness activities that planners need to consider include using available communications tools (see box) to develop messages to address the difficult topics discussed in this guide, including decisions regarding the uses of scarce resources and caring for the sick at home.

RISK COMMUNICATIONS TOOLS FOR PLANNERS

Activities are underway to develop training modules to assist communities prepare for all public health crises. Training guides, publications, and other risk communications documents are available at **www.pandemicflu.gov/rcommunication**.

Given the range of issues to be considered and the potential scope of the pandemic's impact, communities are encouraged to identify what resources will be needed, what processes and systems need to be put in place and to *prepare their plans now* to help mitigate the impact of a pandemic; decrease the amount of infection; and, by extension, reduce hospitalizations and deaths.

The first sections of this chapter set the stage for our hypothetical case study with an overview discussion of influenza and the implications of a pandemic. The succeeding sections of the chapter focus on the key concepts and strategies that planners need to consider when faced with the challenge of planning for a potential flu pandemic and the requisite allocation of scarce resources.

Background

Not all influenza strains are alike. Avian influenza, for example, a strain that occurs naturally among birds, differs markedly from what we know as the seasonal human influenza that claims an average of 36,000 lives annually in the United States (see Table 1).

While these viruses usually do not infect humans, a lethal strain of avian influenza known as H5N1 did appear among humans in Hong Kong in 1997, sending 18 people to the hospital and killing 6 people. The H5N1 strain reappeared in Hong Kong in 2003, killing one person. Since that time, the virus has extended its geographic reach to other nations in Asia, Europe, and the Middle East. According to the World Health Organization, more than 50 percent of the people that have been infected with the virus to date have died.

What is particularly troubling to experts is the knowledge that all influenza viruses are capable of mutating. If the current strain circulating were to gain the capacity to spread easily from person to person, a worldwide influenza pandemic could ensue. While no one can tell if this may happen, experts are concerned about – and are monitoring closely – the evolving H5N1 virus situation in Asia, Africa, and Europe in preparation for a possible pandemic.

Despite the uncertainty about whether or when a pandemic will hit, we do have prior experience with pandemics. Over the course of the last century, the world witnessed three pandemics: the

Table 1. How Seasonal Flu Differs from Pandemic Flu

SEASONAL FLU	PANDEMIC FLU
Outbreaks follow predictable seasonal patterns; occurs annually, usually in winter, in temperate climates	Occurs rarely (three times in 20th century – last in 1968)
Usually some immunity built up from previous exposure	No previous exposure; little or no preexisting immunity
Healthy adults usually not at risk for serious complications; the very young, the elderly and those with certain underlying health conditions at increased risk for serious complications	Healthy children and adults, along with other seasonal high risk groups, may be at increased risk for serious complications
Health systems can usually meet public and patient needs	Health systems may be overwhelmed
Vaccine developed based on circulating flu strains and available for annual flu season	Vaccine probably would not be available in the early stages of a pandemic
Adequate supplies of antivirals usually available	Effective antivirals may be in limited supply
Average U.S. deaths approximately 36,000/year	Number of deaths could be quite high (e.g., U.S. 1918 death toll approximately 675,000)
Symptoms: fever, cough, runny nose, muscle pain. Deaths often caused by complications, such as pneumonia.	Symptoms may be more severe and complications more frequent
Generally causes modest impact on society (e.g., some school closing, encouragement of people who are sick to stay home)	Sever pandemic may cause major impact on society (e.g., widespread restrictions on travel, closings of schools and businesses, cancellation of large public gatherings)
Manageable impact on domestic and world economy	Potential for severe impact on domestic and world economy
Source: **www.pandemicflu.gov**	

"Spanish influenza" of 1918, which resulted in a worldwide death toll of more than 50 million lives; the "Asian influenza" in 1957, which resulted in one-to-two million deaths worldwide; and the "Hong Kong influenza" in 1968, with 700,000 deaths worldwide.

Given the significant growth in not only the human population but animal populations as well since the last pandemic, the current environment may be even more conducive for the reassortment between animal and human influenza strains leading to a novel influenza virus that spreads between people and could cause a pandemic. The sharp increase in worldwide travel over the past 40 years would fuel the rapid spread of the virus even further. Since viruses such as avian flu are not usually transmitted to humans, there is little or no immune protection against them, so most people are susceptible. The supply of antiviral drugs may be inadequate and the development of a vaccine will take a significant amount of time. Moreover, there may be a shortage of supplies, equipment, and hospital beds to cope with a pandemic.

Potential shortages of ventilators could be particularly problematic. In the case of such a pandemic, hospitals may not have an adequate supply of reserve ventilators required to treat patients suffering from acute respiratory failure. The Centers for Disease Control and Prevention (CDC) has a reserve supply of thousands of mechanical ventilators under the Strategic National Stockpile, and is planning to procure additional ventilators in 2007. To help prepare for a potential pandemic, the American Association for Respiratory Care (AARC) has issued a set of guidelines and recommendations (see box).

Key AARC Ventilator Capacity Recommendations

- Increase human resources to assist respiratory therapists and physicians and have easy-to-use ventilators available in the event the respiratory therapists on the hospital staffs cannot handle the volume and noncritical care professionals must be enlisted.
- Extend ventilator capacity for any mass casualty response, expanding the Strategic National Stockpiling Program by 5,000 to 10,000 ventilators. Additional ancillary supplies for ventilator use also should be stockpiled.*
- Develop a distribution plan for ventilators at both the local and national levels.
- Intubation (placing a breathing tube down the windpipe) is recommended for patients suffering acute respiratory failure during a pandemic flu, because ventilation by mask may increase the risk for infection to staff and other patients.
- Prepare for a power outage: each medical center should identify emergency power sources for electricity and compressed gas.

The guidance document is available at **www.aarc.org.**

* HHS has since allocated $25 million toward ventilator procurements.

The impact of the pandemic will be felt in the closing of schools and businesses, with high worker absenteeism as employees remain at home either due to their own illness or to care for a sick family member.

Current State of U.S. Emergency Medicine and Disaster Preparedness

Pandemic response planning efforts will not take place in a vacuum; planners need to be aware of the overall environment in which any disaster preparedness effort will operate. Unfortunately, planners will not be working necessarily from a position of strength in terms of the current state of emergency health care and disaster preparedness in the United States.

> "It became evident to me that [emergency preparedness] was a major part of my responsibility. [September 11] has created a need for an even deeper inspection of our readiness throughout the country. The people of Salina, Kansas weren't really worried about terrorists coming to their town, but they have reason to be concerned about a [flu] pandemic."
>
> – Michael O. Leavitt, Secretary
> U.S. Department of Health and Human Services

According to a recently issued Institute of Medicine report, *Hospital-based Emergency Care: At the Breaking Point*, the U.S. emergency medical care system is seriously unprepared for a national crisis such as a pandemic or terrorist attack. The report concluded that our current emergency medical system is already strained to the breaking point and suffers from inadequate funding along with weak communications and coordination across levels and geographic areas, with little if any surge capacity to deal with a disaster of the magnitude of a flu pandemic or other crisis.

> Many hospitals are already operating at or over capacity. Because major hospitals and emergency departments are already crowded with patients and even may be boarding large numbers of inpatients, there is little or no surge capacity to absorb a large influx of patients from an MCE.
> *Hospital-Based Emergency Care: At the Breaking Point.* Institute of Medicine. June 2006.

It is within this context that every community must address the daunting task of developing a pandemic preparedness response plan. Given the current state of emergency medicine, it is important to reemphasize the key message of the earlier chapters of this guide: advance planning is critical.

Setting the Stage: Progression of a Hypothetical Flu Pandemic

For the purposes of this case study, the Expert MCE Working Group devised a hypothetical pandemic scenario that can be grouped into four periods.

PRE-PANDEMIC PERIOD. The pre-pandemic period is the period in which we currently find ourselves. A limited number of human cases of avian flu H5N1 have occurred in persons

having close contact with infected birds or poultry, and only limited human to human transmission has occurred. This is the period in which the bulk of the planning effort should be completed. Indeed, the discussions throughout this planning guide have emphasized the importance of advance planning for an MCE; it is precisely here in this early pre-pandemic alert period that most of the advance planning for a potential flu pandemic needs to take place.

INITIAL PANDEMIC ALERT: NO CASES IN U.S. The next period in our hypothetical case study involves the confirmation of an outbreak of sustained human-to-human transmission of a strain of H5N1 in a small village in Thailand. The World Health Organization then commits 3 million courses of Tamiflu to the region and requests additional donations from industrialized nations with stockpiles. Thailand also requests additional countermeasures directly from the United States. Other Southeast Asian countries subsequently institute restrictions on movement to protect their populations and prevent the disease from spreading further. By the end of the first phase, there are 446 cases of the disease and 18 deaths in Southeast Asia.

PANDEMIC ALERT: GLOBAL SPREAD AND FIRST CONFIRMED CASES IN U.S. The next period of our pandemic scenario sees the H5N1 virus spreading beyond Southeast Asia to major municipalities, countries, and regions worldwide, with sustained human-to-human transmission. The number of reported infections rises to 158,487 cases worldwide and 6,318 deaths. This period ends with the appearance of the first flu case from the H5N1 virus in the United States.

PANDEMIC PERIOD: WIDESPREAD U.S. PANDEMIC. The final period of our hypothetical pandemic scenario, the pandemic period, involves increased attention to the worsening conditions in the United States, where millions are infected and 2 percent of those infected ultimately die from the disease. Workplace absenteeism and disruption in trade and travel begin to take a large toll on world economies. Shortages of medical supplies, staff members, and facilities complicate treatment of the ill. Over the course of a 7-week period, the number of cases in the United States rises from 90 to nearly 5 million and the number of deaths increases from 1 to nearly 100,000.

Pandemic Flu Case Study: Important Concepts, Strategies, and Actions for Planners

The following sections detail important concepts, strategies, and actions that planners need to incorporate into their preparedness planning. The information is arranged according to the three periods of our hypothetical case study described above. Within each period of the pandemic, we highlight the important concepts to be considered as well as the strategies and actions to be taken within the prehospital, hospital, and alternative care site (ACS) sectors.

As noted earlier in this guide, the home will be particularly relevant in the case of a flu pandemic. Planners must emphasize the importance of the home as a "safe haven" and consider the use of primary care vans to go out into localities to provide services so that people may

remain in their homes. At the same time, planners need to recognize the vital role of primary care providers in deciding which patients may remain at home and which patients need to go to the hospital. In the case of a flu pandemic, primary care providers may be the first medical personnel contacted. Moreover, the ambulatory care system will be a critical element of a system to keep the hospitals from being overwhelmed during a pandemic.

Finally, in addition to looking at the flu pandemic planning considerations in each health care setting, we also detail important palliative care-related issues to be considered.

Not all the material provided in this chapter will be appropriate to each community planner. Indeed, many of the concepts presented here will need to be tailored to the resources available and the systems that are in place in the specific community, locality, region, or State. It is hoped that planners can use this information to help fill in the gaps in their pandemic preparedness plans by answering the questions, "What do I do, and when do I do it?" This chapter aims to provide community planners with options to consider in terms of preparing for a potential flu pandemic.

This chapter presents a hypothetical case study, and the material provided, while extensive, is not exhaustive. Planners are encouraged to consult the wealth of excellent pandemic influenza planning documents for detailed information and recommended actions.

PANDEMIC PREPAREDNESS RESOURCES

A sample of the many valuable resources for community planners include:

State and local government pandemic planning and response avian and pandemic flu information can be found at **www.pandemicflu.gov.**

HHS Pandemic Influenza Plan: **www.hhs.gov/pandemicflu/plan.**

CDC Pandemic Influenza information for Health Professionals: **http://www.cdc.gov/flu/pandemic/healthprofessional.htm.**

World Health Organization materials on influenza preparedness: **http://www.who.int/csr/disease/avian_influenza.**

State health planning information from The Association of State and Territorial Health Officials: **www.astho.org.**

The National Governors Association Primer for Governors and Senior State Officials: **www.nga.org**

Pre-Pandemic Period

This pre-pandemic period represents the period in which we currently find ourselves. This period is where most of the advance planning for a pandemic needs to take place. An overview of issues and activities that community planners need to consider is listed below.

I. General Coordination and Planning Issues

Command Structure

- **Determine the trigger for emergency health powers provision** (see discussion of legal issues in Chapter IV of this guide). Conduct discussions with hospital associations and local and State Public Health officials on when the trigger would be pulled on emergency health powers provisions and who makes that decision.

- **Develop continuity of government and leadership protocols** in the event that senior leadership becomes missing, incapacitated, or deceased.

- **Conduct regional exercises** that are inclusive, use realistic scenarios, involve all responders, and embrace participation from agencies that are often not included.

- **Include local and State political representatives** using education and exercises to get them involved, committed, and supportive.

- **Consider the special needs population and children** in all planning scenarios.

Communications

- **Begin a public communication campaign.** Focus the messaging campaign on managing expectations; and providing updates on the community plan for pandemic response, including community care sites. This communications campaign should be a joint effort by hospitals, hospital partners, and Public Health departments.

- **Emphasize prevention.** Inform and educate the public about influenza. Provide advice and information on prevention and interventions to reduce virus transmission so that if and when the virus arrives the public is knowledgeable about reducing the spread of the virus.

II. Prehospital

- **Prepare universal precautions** for every patient encounter.
- **Pre-plan community staging locations**, which would be pre-designated sites that could be opened ahead of time for alternative care and EMS staging.
- **Locate transport assets** in advance.

Planners are encouraged to consult the EMS planning checklist available at **www.pandemicflu.gov/plan/pdf/EMS.pdf.**

- **Arrange mutual aid agreements** for acquisition and use of specialized assets. This would be accomplished by meeting with local and regional transportation authorities or businesses and agreeing by Memorandum of Understanding (MOU) on deployment, available assets, and staging locations (e.g., buses, other means of transports, staff augmentation). The MOU could be further enhanced by the development of a pre-event contractual agreement between the government and these institutions.
- **Evaluate triage models** such as JUMPSTART, Israel, and SACO.
- **Develop and publicize call centers** to minimize load on hospitals and clinics.

III. Hospital

Planners are encouraged to consult the detailed hospital pandemic preparedness checklist available at **www.hhs.gov/pandemicflu/plan/sup3htmt#app2** as well as overall hospital pandemic planning information at **www.hhs.gov/pandemicflu/plan/sup3.html#s3-III.**

- **The Hospital Planning Committee should complete all components** of hospital pandemic influenza preparedness and response plans (multidisciplinary committee including a range of response partners).
  - Develop hospital guidance for flu pandemic control measures

- Work with other local hospitals, community organizations, State and local health departments to coordinate pandemic response actions.

The hospital pandemic influenza planning committee may include representatives from the following departments, among others:

- Administration
- Legal counsel
- Infection control/hospital epidemiology
- Hospital disaster/emergency coordinator
- Risk management
- Facility engineering/physical plant/institutional safety

- Nursing administration
- Medical staff
- Intensive care
- Emergency Department
- Laboratory services
- Respiratory therapy
- Psychiatry
- Environmental services (housekeeping, laundry)
- Public relations

- Security
- Materials management
- Education/training/Staff development
- Occupational health
- Diagnostic imaging
- Pharmacy
- Information technology
- Other members (infectious diseases, mental health, social work, critical care medicine, pathology, among others)
- Representatives from State and local health departments and community partners such as EMS, local law enforcement, and community service agencies, among others

Source: HHS Pandemic Influenza Plan at **www.hhs.gov/pandemicflu/plan/sup3.html#box1.**

- **Assess surge capacity** (beds, ventilators, etc.) to meet expected increased needs during a pandemic.

- **Develop plan to expand staff capacity.** Determine how the hospital will meet staffing needs during a pandemic.

- **Draw up** preference list of supplemental providers.

  - Consider volunteers, ESAR VHP, CERTs, MRC, clinic staff, out-of-State licensed staff, military, retirees, non-health-care staff, among others.

  - Ensure policies are in place to test and manage deployment of nonhospital personnel at both the community and hospital levels.

  - Ensure that a plan for managing volunteers is in place.

- **Develop contingency plans** for staff absences during a pandemic, particularly ER staff.

- **Initiate discussions** of allocation of hospital resources during a pandemic; hospital administrators to meet with hospital ethics committee early on in planning process:

- **Establish hospital process** for scarce resource allocation
- **Develop communication process** so community understands the rationale behind resource allocation policies.

- **Stockpile** supplies and equipment:
  - PPE equipment (e.g., gloves, masks)
  - Estimate increased need for respiratory care equipment and develop strategy to acquire additional equipment if needed
  - Consult with local and State health departments about access to the national stockpile during a pandemic.
- **Develop** facility access guidelines**.**
  - Define "essential and "non-essential" visitors and develop policies for restricting visitors during a pandemic (and mechanisms for enforcing the policies)
  - Plan to limit hospital entry to a few key entrances
  - Plan for increased security needs during a pandemic.

IV. Alternative Care Sites

Planners are encouraged to consult the HHS Influenza Plan for Alternative Care Sites at **www.hhs.gov/pandemicflu/plan/sup3.html#altcare.**

A major challenge for planners is that in contrast to hospitals and EMS, ACSs do not currently exist as operating medical care systems. In fact, in many communities, ACSs have not even been carefully considered as an option for patient care. Therefore, it is imperative that the planning process for ACSs begin as early in the initial pandemic planning process and include the following activities:

- **Define** ownership, command, and control of ACS.
- **Perform** site selection based on best estimates of need.
- **Decide** on the scope of care to be provided in the ACS.
- **Establish** functional requirements based on the level of care to be provided:

- Acquire supplies, equipment, and pharmaceuticals (including communications equipment).
- Perform staffing planning, taking into account absentee rates from potential sources of staff members.

- **Develop** MOUs for operational support of the ACS.
  - Include housing for health care workers.
- **Develop** policies of operation for the ACS, including:
  - Incident command
  - Criteria for admission, discharge, and transfer
  - Clinical roles and responsibilities
  - Infection control
  - Pharmacy and medication control
  - Safety and security
  - Housekeeping
  - Food service
  - Finances and documentation
- **Develop** a health care risk communication message, including criteria for seeking health care, such as postponement of non-emergency procedures or surgeries.
- **Develop** criteria for hospital decompression.

V. Palliative Care

- **Hold planning discussions of limited treatment options due to scarce resources**. In a situation of scarce resources, decisions will need to be made that typically would not be considered under usual circumstances. The standards of care and treatment decision options will be appropriate to the situation at the time the decision is made. Community planners need to be aware that:
  - It may not be possible always to save a life during a pandemic.

- It is important to have these difficult discussions prior to the occurrence of a pandemic.

- **Establish and maintain standards of palliative care**. Ensure that standards of palliative care are published and available for consideration in pandemic planning efforts.

- **Provide education and training for palliative care responders** in basic preparedness for understanding, recognizing and establishing response actions in a pandemic flu situation.

  - Include instruction about self-protection and avoidance of the spread of disease.

Pandemic Alert Period: Cases Overseas but No Confirmed Cases in U.S.

In this pandemic alert period, there have been confirmed cases of sustained human-to-human transmission of the avian H5N1 influenza virus in Asia. Asian nations request aid from the United States and take steps to protect their populations and prevent the disease from spreading further. By the end of this period in our hypothetical case study there are nearly 500 people infected with the virus and nearly 20 deaths from the disease. Planning activities to consider in this period, after laboratory-confirmed virus changes that predict sustained human-to-human transmission, are listed below.

I. Prehospital

Command Structure

- **Establish an Emergency Operations Center (EOC)**
  - The EOC should include, but not be limited to, representatives of the following groups: community health centers, home health care organizations, hospitals, Public Health agencies (local, State, and Federal), Metropolitan Medical Response Systems, long-term care organizations, and other health-related groups.
  - The EOC will coordinate all EMS resources by including public, private, and volunteer representatives.
  - The EOC should encourage the use of health area operation centers. This will allow the EOC to communicate directly with a larger medical community, which could provide guidance and direction.

Communications

- **Establish a comprehensive public information strategy**
  - Use mass media to provide the public information on preventive measures, home care management, and the appropriate time to seek health care services.
  - Use community health care call centers to reinforce mass messaging and to provide additional and more tailored information to individuals with questions and concerns. Review these issues for their value as potential mass media messages.

- Use community call centers to assist with outpatient (home care) monitoring and support, thereby helping to extend the reach of public health and healthcare systems into households.

- Use information collected by the call centers for situational awareness and disease outbreak management and control.

II. Hospital

Command Structure

- **Partially activate the Hospital Incident Command System (HICS)** with the assignment of an Incident Commander (IC).

- **Hold briefings for administrators and staff members.** Review talking points and discuss general action plans to be followed in the event that a flu pandemic should spread to the United States.

- **Establish the hospital process for allocating scarce resources.** Activate/test internal hospital committees on standards of care if necessary. Review policies and protocols.

Training

- **Conduct Just-in-time-training** for staff members, including influenza transmission, general information, infection control information, ventilator management, and hospital plans. Training is to be conducted via e-mail, informational posters, and shift briefings.

- **Conduct Personal Protection Equipment (PPE) Training**. Perform fit testing for the outpatient and inpatient staff, donning/doffing instruction, practice, and competencies. This training is to be checked by nursing unit, PPE inventory, and parameters for use per infection control.

Supplies

- **Increase hospital supplies** from the usual baseline of 3-day supply to 7-day supply if possible (based on an estimated 150 percent occupancy rate). Specific actions to focus on include:

  - Order, inventory, and increase par levels of IV fluids, medicines, linens, and other consumable medical goods.

Communications

- **Establish lines of communication** among Public Health officials, hospitals, EMS and emergency medicine to provide daily updates.
  - Identify personnel/procedures to run the Joint Information Center (JIC).
- **Ensure daily communications** with Public Health and EMS.
  - Designate a public relations person as the hospital Public Information Officer.
  - Reinforce the public information messaging begun in Pre Pandemic period.

Drills, Tests and Reviews

- **Test the initiation process** with partner facilities (e.g., durable supplies stored in a local convention center, disposables from a local Target store and partner hospitals via pre-agreement and increased par levels), drill action planning cycles, and notifications.
- **Test Health Alert Network (HAN)** to include off hours and notification of HAN alerts from the ED to infection control.
- **Review plans for security, behavioral health, and general disaster contingencies.** Review the facilities plan, including HVAC and other cohorting plans.

Monitor Outbreak; Screen Outpatients

- **Establish a local Public Health point of contact.** Begin Department of Health (DOH) monitoring of influenza-like illness (outpatient and inpatient).
- **Screen outpatients per CDC guidance** for influenza symptoms based on fever and/or respiratory symptoms and travel history. Begin screening at the Emergency Department and outpatient clinic check-in points.
- **Verify referral agreements with local hospitals** in order to ensure that patients will be accepted. Clarify patient movement for infectious cases between hospitals (e.g., EMS protocol for transfer patients) and within a hospital (e.g., protocol for elevator transport of pandemic patients).
- **Reinforce infection control and respiratory etiquette** for those with respiratory symptoms using posters, staff reminders, educational materials, and patient masks and tissues at triage and clinic registration points as well as near common points such as elevators and major entrances.

- **Plan for Vaccine Distribution.** Arrange internal distribution to staff members based on prior planning and in concert with State and regional plan criteria for essential personnel.

III. Alternative Care Sites

The following measures need to be undertaken to prepare for operation of the ACS:

- **Perform** resource assessment for standing up an ACS
  - Include acquisition of additional necessary disposable supplies
- **Finalize** policies of operation for the ACS
- **Exercise** the ACS if possible
  - As early as possible, explore the legal issues around standing up an ACS for full functional exercise with patients
- **Test** communications
- **Identify** and roster the ACS staff
- **Establish** a process of immunization and prophylaxis of potential staff members
- **Develop** a patient transport plan for movement of ACS patients to and from area hospitals

Pandemic Alert Period: Global Cases and First Confirmed Cases in the U.S.

In this period of our hypothetical pandemic case study scenario, the avian H5N1 flu virus begins to spread from Asia to other nations around the world. The number of people infected rises significantly as does the number of deaths. The second period ends with the first appearance of the avian flu virus in the United States. In this second period planners need to consider the following activities.

I. Prehospital

- **Prepare** to open community staging locations
- **Engage** mutual aid partners
- **Consider home care preparations.** During a pandemic, it is likely that the home will serve as a major care site. Planners may want to consider the following steps:
  - Ensure adequate stock of routine, chronic care medications is available to the community.
  - Ensure adequate stock of basic first aid supplies, including bandages, antipyretic medications (acetaminophen, ibuprofen), oral electrolyte solutions), and thermometers.
  - Ensure that backup utility support is in place should the power grid be disrupted by decreased staffing for those patients requiring electricity support for medical devices.
  - Provide advice on the establishment of a "sick room" in the home for primary management of ill household members.
  - In the event of caring for patients with advanced symptoms "too sick" for hospital care, provide symptom palliation with a home care team coordinated by local public health authorities.
  - Ensure availability of a bedside commode or bedpan.
  - Ensure availability of a bedside humidifier if possible.

II. Hospital

Command Structure

- **Fully activate the HICS** and open a hospital command post.

Patient Screening

- **Continue to limit hospital entry** to a few key entrances.
- **Screen patients for symptoms of influenza** (fever, respiratory symptoms) and relevant travel history (if defined enough) and with rapid diagnostic tests if available in the tent adjacent to the triage entrance.
- **Mask patients** with suspect symptoms and make sure that providers wear appropriate PPE until a potential influenza case is ruled out.

Anticipate Hospital Surge

- **Schedule** and, to the extent possible, perform all elective surgeries within the next few weeks.
- **Ramp up outpatient services** by increasing clinic hours and personnel to provide nonurgent services (such as annual exams, prenatal checks, and rechecks) that would be difficult to obtain during a pandemic. Extra staffing will be needed because outpatient services will be a likely place for screening of those who are concerned that they may have the flu.
- **Communicate with the public** about the need to get nonemergency services taken care of sooner rather than later. Use mass media to reinforce this message: *"During a pandemic, you will not be seen in the clinics for nonurgent conditions."*
  - Establish a hospital hotline and enable the prerecorded greeting to triage calls for information to nonclinical staff and clinical inquiries to appropriate staff at the department of health.
- **Create temporary anterooms** on medical surgical floors, and utilize the intensive care unit (ICU) as a cohorting area during the early phase of a pandemic.
- **Prepare flat space areas** in conference rooms, auditoriums, etc., for patient care (organize cots, linens, etc.).

- **Open a joint information center (JIC)** with the hospital association acting as liaison with all hospitals in the region. The regional coordinating hospital provides updates and solicits baseline availability of ventilators and patient beds.

III. Alternative Care Sites

- **Establish incident command structure for ACS.** Planners should ensure that ACS is integrated with community, regional and State incident command systems.
- **Unpack and inventory supplies** at the selected site(s)
- **Enable the security protection systems** of the ACS to protect the supplies.

IV. Palliative Care

- **Discuss goals of care.** Each person who is infected with the flu has the potential of developing complications, either based on their previous health history or as a consequence of the flu itself. These complications may lead to a situation where the individual becomes too sick to survive. While the health care professional is helping this person through the various stages of their disease, it may become necessary to have a discussion regarding the goals of care and patient preferences. Establish goals of care, acknowledging that individuals may die as a result of influenza.
- **Provide information on treatment options**. Patients and families need to have updated information so they may understand their condition and treatment options.
  - The decisionmaking process about the patient's care plan must be sensitive not only to changes in the patient's condition but also to the availability of community resources.
  - Address pain and symptom control, psychosocial distress, spiritual issues, and practical needs with the patient and their family throughout the continuum of care.

V. Home Care Issues

- **Address the myriad challenges of providing health care services** in the home setting to people with substantial disability and/or an established illness or without family or other resources to provide care. Community planners should consider the following issues related to providing care in the home setting:

  - Develop alternative ways to provide care to people in the community such as primary care vans that go into neighborhoods to provide care, answer questions, and provide resources.

  - Establish telephone hotlines to answer questions regarding the avian flu virus, such as using "Ask-A-Nurse"-type telephone support services and make use of existing hotlines.

- **Consider ways to provide incentives for people to work during times of crises**. Planners should be aware that health care workers may not want to leave their families to care for flu patients and should consider incentives (e.g., giving them priority status for vaccines).

Pandemic Period: Increased and Sustained Transmission in U.S. Population

In this the final period of our hypothetical case study planning exercise, the avian flu virus has spread to communities across the U.S. Millions of individuals are infected with the virus and the death toll is increasing steadily. In this final period of the pandemic, planners need to consider the following measures.

I. Prehospital

Set Up and Utilize Casualty Treatment Areas

- **Use formal triage and treatment protocols** and have triage and treatment completed in nontraditional triage/treatment areas by bringing prehospital personnel to casualty treatment areas.
- **Determine who can be treated** on site to include those triaged with moderate (yellow) and minor (green) status.
- **Determine who should be transported** to area hospitals and by what means, with the sickest casualties with a reasonable chance of survival are treated and transported first.
- **Bring in prehospital personnel** to staff these areas.
- **Prepare equipment caches** containing MCE-specific supplies so they are readily deployable. Examples would include staffing and additional field-related treatment modalities for both advanced life support (drugs, airway, etc.) and basic life support (splints, oxygen, dressing, etc.) as well as easily deployable tents with portable generation.
- **Consider suspension of some medical protocols** (e.g., base contact for certain interventions, expansion of scope of practice, appropriate standard of care).
- **Consider bringing medical care** to the people triaged with moderate (yellow) and minor (green) status.
- **Consider secondary triage methodologies** such as one hospital triaging patients to another.

911 Dispatch Issues

- **Dispatcher screening** of response need
- **Provide** precaution advice for scene responders
- **Limit** the number of responders to the minimal necessary response
- **Provide** a nonemergency information and advice line

Maximize Utilization of Available Personnel

- **Create modified shifts;** expand number of providers and vehicle types

Maximize Transport Capability

- **Staff ambulances** with one EMT and a non-EMT driver (firefighter, police officer, teacher, etc.).
- **Expand the use of paramedic-initiated** alternative transport mechanisms (e.g., buses, taxis, privately owned vehicles).
- **Load ambulances** with more than one patient (e.g., two critical, one critical plus one or more noncritical).
- **Air transport** probably will be of limited use.

Maximize Personal Protection Available to Personnel

- **Distribute vaccine** to personnel with the additional consideration for inclusion of family members.

Maximize Destination Choices

- **Encourage home care rather than transport,** if possible. Transport patients not only to hospitals but also to clinics and ACS.
- **Consider other potential sites** such as nursing homes, public buildings, etc.
- **Consider "batching" noncritical** calls in the same geographic area and transporting all patients to the closest appropriate facility rather than the facility of the patient's choice.

II. Hospital

Planning and Information

- **Institute action planning.** The planning section anticipates resource needs for the next operational period and gathers situational information from within the hospital and from regional/State entities. It also works with personnel to determine staffing and availability.

- **Activate the Joint Information Center opened during the pandemic alert period**. The JIC is managed by the hospital association liaison for all hospitals in conjunction with Public Health and EMS. The JIC will become responsible for providing daily media messages and holding press conferences.

  - Establish daily briefing cycle for staff members and media (arranged with the JIC).

Activate Multiagency Coordination System

- **Have key representatives** from Public Health, Emergency Medicine, EMS, and hospital staff monitoring information on the system status from all agencies/hospitals (including liaisons from neighboring States).

- **Conduct action planning** at the regional level.

- **Compare** the "triage levels" at area facilities to assure consistency.

- **Request resources** (when possible) via jurisdictional Emergency Medicine.

- **The Staffing Coordinator manages** Public Health, Emergency Medicine, EMS, and hospital requests for staffing and allocates them based on the sources available, including the Medical Reserve Corps and ESAR VHP.

- **Communicate** with the State EOC or the State DOH about regional resource and policy needs.

- **Ensure** Public Health coordination with home care agencies and messaging, hotline and Internet support for families.

Review Staffing Plans

- **Use families to provide basic patient care.** The hospital should engage the patients' families (one person at a time) to provide basic patient care, such as feeding. Nurses (including Medical Reserve Corps, ESAR VHP, and retirees

with appropriate mentorship by current staff nurses) provide medications and assessments and review vital signs.

- Respiratory therapy manages ventilators only; other respiratory care services are to be provided by nurses. Floor nurses are to receive training in basic ventilator monitoring, with floor units supervised by a roving ICU nurse to monitor ventilated patients.

- Physicians see patients on an as-needed basis, providing critical interventions and assessment for interventions, transfer, and discharge.

- **Consider expanding staff capacity** with changes in staff scheduling (e.g., duration of shifts, staffing ratios, changes in staff assignments), though it is important to note that longer shift duration during an infectious event may be detrimental to staff who do not adhere to PPE recommendations when fatigued.

Review Use of Hospital Space and Supplies

- **Set up cohort areas of inpatient and outpatient units** for infectious patient care. These areas are to be used when volume allows (the entire facility may be a cohort during peak periods).

- **Select operating room and procedure room space** to be used for additional ventilated patient care.

- **Use minimal documentation**. Use short assessment and plan notes – medication and vital signs documentation, for example.

- **Reuse disposable supplies** when possible.

Clinical Care Committee

- **Institute daily meetings of the clinical care committee** to examine new guidance, the situation at the hospital, and the regional situation and to determine appropriate levels of care to be offered based on staffing and other resources. The committee adapts State guidance to the hospital level and reviews any updates.

  - The Committee submits recommendations to the Planning Chief and then to the IC.

  - On approval of the IC, any changes to the previous day's triage, treatment, and diagnosis protocols are communicated to the ED, outpatient, and inpatient areas. These changes may include:

    - Guidance on laboratory and x-ray testing (both influenza case testing and clinical lab/x-ray guidance)

- Guidance on outpatient/ED denial of service (e.g., deny care to those who will not be seen due to their injury/illness being too minor)
- Updated information for all patients and family members presenting to the facility to be handed out by a triage nurse and reviewed with the patient's nurse or physician
- Inpatient care guidelines (staff responsibilities)
- Inpatient triage/resource situation
- Anticipated events/trends in the next operational period.

Patient Triage

- **Set up a triage team** (may consist of one critical care and one infectious disease physician, among others) to review conflicting resource needs (e.g., two patients needing a single ventilator) on a case-by-case basis.
  - The team recommends assigning the resource to the patient with the better prognosis – using decision tools supplied via the State and the clinical care committee.
  - Physicians are to provide patient care when not performing triage functions.
- **Identify a Bed Czar** to monitor the bed and "hard" resource statuses (e.g., ventilators), make assignments based on availability, and implement triage team recommendations.
  - The bed czar receives input from clinical units about patient statuses (improving, deteriorating, etc.) on a scheduled basis.

Enable Hospital Decompression

- **Establish alternative care sites** in conjunction with other area hospitals as well as in conjunction with Public Health and Emergency Medicine to enable hospital decompression.
- **Notify** EMS, Public Health, and others of need to decompress the hospital, as needed.
- **Transfer patients** to and from facilities as needed based on hospital resources; critical care to be concentrated in hospitals.

Establish a Regional Home Death Management Process

- **Set up regional hubs** for body retrieval and processing with a review by the Medical Examiner, a registration process, and a temporary holding place awaiting definite management.
- **Deploy refrigerated trucks** from the hospital for body management, exchanged daily to regional processing sites.
- **Arrange for Web-based death certificate** processing and secure tracking to the Department Of Health.

Hospitals in Rural Areas

Some of the issues that planners need to consider that are more likely to apply to hospitals located in rural areas, include:

- **The triage physician** (and/or nurse) implementing decisions at the hospital/ward level.
- **Promoting a regional hospital and multiagency coordination system** to share staff and resources as possible and help hospitals in the region share information. Coordinate the setup of a regional ACS when needed (under the host city's jurisdictional umbrella).
  - **Patient referral** to regional hospitals (when possible) or supportive care provided to the extent possible at the facility.
  - **Offsite care (may be a single regional facility).** The ACS is the screening and care point for noncritical patients (the ACS fulfills the need for additional screening/minor treatment in a rural area, whereas in an urban area it is opened for referral transfers from hospitals only). In smaller communities, hospitals and clinics may not have the space and resources for screening that urban areas have, so bottlenecks may occur in outpatient assessment as well as inpatient care.
- **Coordination of care** with home care/families
- **The hospital coordinates with local public health agency** to determine the scope of care in the community and facilitate home and ;palliative care.
- **Transfers** from the hospital morgue to a regional processing point or local undertakers with the Medical Examiner as needed.

III. Alternative Care Sites

- **Ensure all ACSs** are fully operational.
- **Investigate the need** for the establishment of other functional sites for the potential purposes of supplying ambulatory care, inpatient care, quarantine, and/or palliative care.
- **Establish criteria for terminating operation** of the ACSs as the pandemic eventually passes.

IV. Palliative Care

Patient Triage

- **Establish patient triage criteria** by levels of care
  - **Classification of patients** who are already chronically ill, extremely old, or in long-term care facilities (e.g., by physician prognosis).

Establish Plans for Use of Long-term Care Facilities

- **Nursing homes also could provide a preventive care response** to an influenza pandemic (e.g., immunizations, drug management), thereby providing relief to hospitals. Nursing homes have not only the medical expertise, but also the capability to maintain supplies that could prove useful in a pandemic.

Appendix A: Participant List

Expert Meeting on Providing Mass Medical Care with Scarce Resources

L'Enfant Plaza Hotel

480 L'Enfant Plaza, S.W.

Washington, DC

June 1–2, 2006

Writing Teams

Ethical Considerations in Community Disaster Planning

Marc Roberts, Ph.D.
Professor of Economy
Department of Health Policy Management
Harvard University

Evan G. DeRenzo, Ph.D.
Bioethicist
Center for Ethics
Washington Hospital Center

Alternative Care Sites

Stephen Cantrill, M.D.
Associate Director
Department of Emergency Medicine
Denver Health Medical Center

Carl Bonnett, M.D.
Emergency Medical Services Fellow
Department of Emergency Medicine
Denver Health Medical Center

Dan Hanfling, M.D., FACEP
Director
Emergency Management and Disaster Medicine
Inova Health System

Peter Pons, M.D. (Also in Prehospital Care)
Professor of Emergency Medicine
Department of Surgery
University of Colorado Health Sciences Center
Senior Technical Physician, Emergency Department
Denver Health Medical Center

Assessing the Legal Environment Concerning Mass Casualty Event Planning and Response

James G. Hodge, Jr., J.D., LL.M.
Associate Professor
Johns Hopkins Bloomberg School of Public Health
Executive Director, Center for Law and the Public's Health
Georgetown and Johns Hopkins Universities

Hospital/Acute Care

John L. Hick, M.D.
Assistant Professor
Emergency Department
Hennepin County Medical Center

Gabor Kelen, M.D.
Director, Office of Critical Event Preparedness and Response (CEPAR)
Professor and Chair, Director of Research
Department of Emergency Medicine
The Johns Hopkins University

Daniel O'Laughlin, M.D.
Assistant Professor of Emergency Medicine
University of Minnesota/Abbott Northwestern Hospital

Lewis Rubinson, M.D., Ph.D.
Health Officer
Division of Pulmonary and Critical Care Medicine
Deschutes County Health Department
Bend Memorial Clinic

Richard Waldhorn, M.D.
Distinguished Scholar
Center for Biosecurity
University of Pittsburgh Medical Center

Dennis P. Whalen
Executive Deputy Commissioner
New York State Department of Health
Empire State Plaza

Palliative Care

Marianne Matzo, Ph.D., APRN, BC, FAAN
Professor and Frances E. and Earl Ziegler Chair in Palliative Care
Palliative Care Nursing
University of Oklahoma College of Nursing
University of Oklahoma Health Sciences Center

Anne M. Wilkinson, M.S., Ph.D.
Senior Social/Behavioral Scientist
Palliative Care Policy Center
RAND Corporation

Maria Gatto, M.A., APRN
Director of Palliative Care
Bon Secours Health System

Joanne Lynn, M.D., M.A., M.S.
Senior Natural Scientist
RAND Corporation

Prehospital Care

Edward Gabriel, M.P.A., AEMT-P
Director of Crisis Management
The Walt Disney Corporation

George Foltin, M.D.
Associate Professor of Pediatrics and Emergency Medicine
Center for Pediatric Emergency Medicine
Bellevue Hospital

Paul Maniscalco, M.P.A., EMT-P
Assistant Professor/Chief Researcher
Homeland Security Policy Institute
The George Washington University

Richard Serino, EMT-P
Chief
Boston Emergency Medical Service

Meeting Participants

Michael B. Anderson, M.H.A.
Senior Advisor for Public Health and Emergency Preparedness
Preparedness Directorate
Office of Grants and Training
U.S. Department of Homeland Security

Knox Andress, R.N.
Weapons of Mass Destruction Response Coordinator
CHRISTUS Schumpert Health System
Emergency Preparedness Committee
Emergency Nurse Association

Lynne Bergero, M.H.S.A.
Project Director
Division of Standards and Survey Methods
Joint Commission on Accreditation of Healthcare Organizations

Sumner L. Bossler, R.N., CEN
Senior Public Health Analyst
Health Care Emergency Preparedness
Bioterrorism Hospital Preparedness Program
Health Resources and Services Administration
U.S. Department of Health and Human Services

James Geiling, M.D.
Chief of Medicine
Veteran Affairs Medical and Regional Office Center
White River Junction, VT

Robert M. Gougelet, M.D.
Assistant Professor of Emergency Medicine
Dartmouth Hitchcock Medical Center
Medical Director, Disaster Response
Dartmouth Medical School

James G. Hodge, Jr., J.D., LL.M.
Associate Professor
Johns Hopkins Bloomberg School of Public Health
and Executive Director
Center for Law and the Public's Health at
Georgetown and John Hopkins Universities

Richard C. Hunt, M.D., FACEP
Director
National Center for Injury Prevention and Control
Division of Injury and Disability Outcomes and Programs
Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

Brian Kamoie, J.D., M.P.H.
Special Assistant
Department of Health Policy and Department of Health Services Management and Leadership
Office of the Assistant Secretary for Preparedness and Response
U.S. Department of Health and Human Services

Ann Knebel, R.N., D.N.Sc., FAAN
Deputy Director for Preparedness Planning
Office of Preparedness and Emergency Operations
Office of the Assistant Secretary for Preparedness and Response
U.S. Department of Health and Human Services

William J. Kormos, USAF, M.Sc., CHE
CONUS Medical Planner
Force Health Protection and Readiness
Office of the Assistant Secretary of Defense
U.S. Department of Defense

Julie Krueger
Public Health Fellow
Office of Emergency Medical Services
National Highway Traffic Safety Administration
U.S. Department of Transportation

Deborah A. Levy, Ph.D., M.P.H.
Senior Advisor for Healthcare Preparedness
Division of Healthcare Quality and Promotion
National Center for Infectious Diseases
Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

David Marcozzi, M.D., FACEP
Senior Medical Advisor
Office of Preparedness & Emergency Operations
U.S. Department of Health and Human Services

F. Christy Music, M.S., M.T., ASCP, SBB
Senior Advisor, Health Affairs and Medical Homeland Security Policy
Office of the Assistant Secretary of Defense for Homeland Defense
U.S. Department of Defense

La Forice Nealy
Director of Response and Emergency Communication
The American Red Cross of Greater Chicago

Ann E. Norwood, M.D.
Senior Analyst
Office of the Assistant Secretary for Preparedness and Response
U.S. Department of Health and Human Services

Nicki T. Pesik, M.D.
Deputy Science Team Medical Officer
Bioterrorism and Preparedness and Response Program
Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

Sally J. Phillips, R.N., Ph.D.
Director, Public Health Emergency Preparedness Research Program
Center for Primary Care, Prevention, and Clinical Partnerships
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services

Melissa Sanders, R.D.
Branch Chief
Health Care Emergency Preparedness
Bioterrorism Hospital Preparedness Program
Health Resources and Services Administration
U.S. Department of Health and Human Services

Scott Sasser, M.D.
National Center for Injury Prevention and Control
Department of Emergency Medicine
Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

Kevin Yeskey, M.D.
Director, Office of the Secretary
Office of the Assistant Secretary for Preparedness and Response
U.S. Department of Health and Human Services

Appendix B. Bibliography

Chapter 1. Introduction

Agency for Healthcare Research and Quality. Altered Standards of Care in Mass Casualty Events: Bioterrorism and Other Public Health Emergencies. AHRQ Publication No. 05-0043. Rockville, MD: Agency for Healthcare Research and Quality; April 2005, 16-18. Available at: http://www.ahrq.gov/research/altstand/index.html. Accessed November 27, 2006.

Chapter 3. Assessing the Legal Environment Concerning Mass Casualty Event Planning and Response

50 U.S.C. §§ 1601(b) (2006).

Agency for Healthcare Research and Quality. Altered Standards of Care in Mass Casualty Events: Bioterrorism and Other Public Health Emergencies. AHRQ Publication No. 05-0043. Rockville, MD: Agency for Healthcare Research and Quality; April 2005, 16-18. Available at: http://www.ahrq.gov/research/altstand/index.html. Accessed November 27, 2006.

The Americans with Disabilities Act of 1990. Pub. L. No. 101-336.

Center for Law and the Public's Health. *Model State Emergency Health Powers Act.* (2001). Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf. Accessed April 15, 2006.

Center for Law and the Public's Health, Health Resources and Services Agency. Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) – Legal and Regulatory Issues. 2006:23.

Center for Law and the Public's Health. *MSEHPA Legislative Surveillance Table,* July 15, 2006. Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA%20Surveillance.pdf. Accessed November 27, 2006.

Center for Law and the Public's Health. Public health emergency legal preparedness checklist on interjurisdictional legal coordination. 2004. Available at: http://www.publichealthlaw.net/Resources/BTlaw.htm. Accessed November 27, 2006.

Center for Law and the Public's Health. Checklist on local government public health emergency legal preparedness and response. Available at: http://www.publichealthlaw.net/Resources/BTlaw.htm. Accessed November 27, 2006.

Emergency Management Assistance Compact (EMAC), Pub. L. No. 104-321.

Fox P. Cross-border assistance in emergencies: the New England/eastern Canadian model. *New England Journal of International Contemporary Law*. 2004;11:75.

Federal Volunteer Protection Act of 1997. Pub. L. No. 105-19, § 4, 111 Stat. 218, 219 (1997), 42 U.S.C. § 14503 (2000); Ala. Code. § 6-5-336(d)(1) (LexisNexis 2005); Miss. Code Ann. § 95-9-1(3) (LexisNexis 1972).

Gostin LO. *Public Health Law: Power, Duty, Restraint*. Berkeley: University of California Press; 2002:263-265.

Gostin, LO, Hodge JG Jr. The Model State Emergency Health Powers Act – A Brief Commentary. Seattle: Turning Point Statute Modernization Collaborative, 2002; 1-42. Available at: http://www.publichealthlaw.net/Resources/Modellaws.htm#MSEHPA. Accessed November 27, 2006.

Gostin LO, Sapsin JW, Teret SP, Burris S, Mair JS, Hodge JG Jr., Vernick JS. The Model State Emergency Health Powers Act: planning for and response to bioterrorism and naturally occurring infectious diseases. *JAMA*. 2002;288:622.

Hodge JG Jr. Bioterrorism law and policy: critical choices in public health. *Journal of Law, Medicine, & Ethics*. 2002;30:254-255.

Hodge JG Jr. *Delaware Public Health Emergency Law - Review, Recommendations, and a Blueprint for Reform.* Dover, DE: Delaware Department of Health and Social Services; 2004;1-62.

Hodge JG Jr. The intersection of Federal health information privacy and State administrative law: the protection of individual health data and worker's compensation. *Administrative Law Review*. 1999;51:117-144.

Hodge JG Jr. Legal issues concerning volunteer health professionals and the hurricane-related emergencies in the Gulf Coast region. *Public Health Report*. 2006;121:205-207.

Hodge JG Jr. Legal triage during public health emergencies and disasters. *Administrative Law Review.* In press.

Hodge JG Jr, Calves S, Gable LA, Meltzer E, Kraner S. Risk management in the wake of hurricanes and other disasters: Hospital civil liability arising from the use of volunteer health professionals during emergencies. *Michigan State University Journal of Medicine and Law*. In press.

Hodge JG Jr, Gable LA, Calves S. The legal framework for meeting surge capacity through the use of volunteer health professionals during public health emergencies and other disasters. *Journal of Contemporary Health Law and Policy*. 2006;22:5-71.

Hodge JG Jr, O'Connell J. The legal environment underlying influenza vaccine allocation and distribution strategies. *Journal of Public Health Management and Practice.* 2006;12(4):340-348.

Intergovernmental Mutual Aid Agreement for the establishment of the Illinois Public Health Mutual Aid System. Available at: http://www.idph.state.il.us/local/mutualaidagree_9.30.04.pdf . Accessed November 27, 2006.

M.C.L. §§ 418.161(g), 30.411 Sec. 11(1)(b)-(c).

Md. Code Ann., Public Safety §§ 14-3A-03(c), 14-3A-08 (Supp. 2004).

Massachusetts General Laws Annals. ch. 112, § 12B, ch. 111C, § 20 (West 2003).

Mid-America Alliance: Mutual Assistance for Public Health Preparedness (2005). Available at: http://app1.unmc.edu/midameria. Accessed November 27, 2006.

The New York "Human Rights Law," New York Executive Law Art. 15 §290 et seq.

Public Health Service Act, 42 U.S.C. § 201 et seq. (2006). Public Health Security and Bioterrorism Preparedness and Response Act of 2002, 42 U.S.C. § 247d. 2003.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-5206 (2002).

The Uniform Emergency Healthcare Services Act § 7(c). In press.

University of Maryland Center for Health and Homeland Security. *Maryland Public Health Emergency Preparedness Legal Handbook*. 2005:31.

The White House. The Federal Response to Hurricane Katrina: Lessons Learned. 2006:58. Available at: http://www.whitehouse.gov/reports/katrina-lessons-learned/2006:58. Accessed November 27, 2006.

Chapter 4. Prehospital Care

Avitzour M, Libergal M, Assaf J, et al. A multicasualty event: out-of-hospital and in-hospital organizational aspects. *Academic Emergency Medicine*. 2004;11:1102–1104.

Briggs SM, Brinsfield KH. *Advanced Disaster Medical Response Manual for Providers*. Cambridge, MA: Harvard Medical International Trauma & Disaster; 2003.

Christen HT, Maniscalco PM. *The EMS Incident Management System – EMS Operations for Mass Casualty and High Impact Incidents*. Upper Saddle River, NJ: Brady – Prentice Hall; 1998.

Christen HT, Maniscalco PM. *Mass Casualty and High Impact Incidents: An Operations Guide*. Upper Saddle River, NJ: Brady – Prentice Hall; 2002.

de Boer J. An attempt at more accurate estimation of the number of ambulances needed at disasters in the The Netherlands. *Prehospital and Disaster Medicine*. 1996;11:125–128.

de Boer J, Debacker M. A more rational approach to medical disaster management applied retrospectively to the Enschede fireworks disaster, 13 May 2000. *European Journal of Emergency Medicine*. 2003;10:117–123.

Dow AA, Clark WE, Farmer JC, et al. Disaster management. Organizations and academic perspective. *Critical Care Clinics*. 1991;7:257–270.

Doyle CJ. Mass casualty incident. Integration with prehospital care. *Emergency Medical Clinics of North Americ*a. 1990;8:163–175.

Farmer CJ, Jimenez EJ, Talmor D, Zimmerman JL. *Fundamentals of Disaster Management*. Des Plains, IL: Society of Critical Medicine; 2003.

Farmer JC, Carlton PK, Jr. Providing critical care during a disaster: the interface between disaster response agencies and hospitals. *Critical Care Medicine*. 2006;34(3 Suppl):S56–S59.

Fenn J, Rega P, Stavros M, Buderer NF. Assessment of U.S. helicopter emergency medical services' planning and readiness for disaster response. *Air Medical Journal*. 1999;18:12–15.

Fitzgerald DJ, Sztajnkrycer MD, Crocco TJ. Chemical weapon functional exercise – Cincinnati: observations and lessons learned from a "typical medium-sized" city's response to simulated terrorism utilizing weapons of mass destruction. *Public Health Report*. 2003;118:205–214.

Flowers LK, Mothershead JL, Blackwell TH. Bioterrorism preparedness II: The community and emergency medical services systems. *Emergency Medical Clinics of North America*. 2002;20:457–476.

Graham CA, Hearns ST. Major incidents: training for on site medical personnel. *Journal of Accident & Emergency Medicine*. 1999;16:336–338.

Grissom TE, Farmer JC. The provision of sophisticated critical care beyond the hospital: lessons from physiology and military experiences that apply to civil disaster medical response. *Critical Care Medicine*. 2005;33(1 Suppl):S13–S21.

Jacobs LM, Gabram SG, Stohler SA. The integration of a helicopter emergency medical service in a mass casualty response system. *Prehospital and Disaster Medicine*. 1991;6:451–454.

Key CB. Operational issues in EMS. *Emergency Medical Clinics of North America*. 2002;20:913–927.

Maningas PA, Robison M, Mallonee S. The EMS response to the Oklahoma City bombing. *Prehospital and Disaster Medicine*. 1997;12:80–85.

Maniscalco PM, Christen HT. *Public Health Guide for Emergencies, First Edition*. Baltimore: The Johns Hopkins University School of Hygiene and Public Health and The International Federation of Red Cross and Red Crescent Societies; 2000.

Maniscalco PM, Christen HT. *Understanding Terrorism and Managing its Consequences*. Upper Saddle River, NJ: Brady – Prentice Hall; 2001.

Martchenke J, Rusteen J, Pointer JE. Prehospital Communications during the Loma Prieta earthquake. *Prehospital and Disaster Medicine*. 1995;10:225–231.

Martchenke J, Lynch T, Pointer J, Rooker N. Aeromedical helicopter use following the 1989 Loma Prieta earthquake. *Aviation, Space, and Environmental Medicine*. 1995;66:359–363.

Palafox J, Pointer JE, Martchenke J, Kleinrock M, Michaelis J. The 1989 Loma Prieta earthquake: issues in medical control. *Prehospital and Disaster Medicine*. 1993;8:291–297.

Peleg K, Michaelson M, Shapira SC, Aharonson-Daniel L. Principles of emergency management in disasters. *Advances in Renal Replacement Therapy*. 2003;10:117–121.

Prezant DJ, Clair J, Belyaev S, et al. Effects of the August 2003 blackout on the New York City healthcare delivery system: a lesson for disaster preparedness. *Critical Care Medicine*. 2005;33(1 Suppl):S96–S101.

Risavi BL, Salen PN, Heller MB, Arcona S. A two-hour intervention using START improves prehospital triage of mass casualty incidents. *Prehospital Emergency Care*. 2001;5:197–199.

Stohler SA, Jacobs LM, Gabram SG. Roles of a helicopter emergency medical service in mass casualty incidents. *Journal of Air Medical Transport*. 1991;10:7–13.

Thomas SH, Harrison T, Wedel SK, Thomas DP. Helicopter emergency medical services roles in disaster operations. *Prehospital Emergency Care*. 2000;4:338–344.

U.S. Agency for International Development for Humanitarian Response (USAID), Office of Foreign Disaster Assistance. *Field Operations Guide for Disaster Assessment and Response*, v. 3.0. Washington: USAID; 1998.

Walsh DW, Christen HT, Miller GT, Callsen CE, Cilluffo FJ, Maniscalco PM. *National Incident Management System: Principles and Practice*. Sudbury, MA: Jones & Bartlett Publishers; 2005.

Withers MR, Christopher GW. Aeromedical evacuation of biological warfare casualties: a treatise on infectious diseases on aircraft. *Military Medicine*. 2000;165(11 Suppl):1–21.

Chapter 5. Hospital/Acute Care

Agency for Healthcare Research and Quality (AHRQ). *Altered Standards of Care in Mass Casualty Events: Bioterrorism and Other Public Health Emergencies*. AHRQ Publication No. 05-0043. Rockville, MD: AHRQ; April 2005. Available at: http://www.ahrq.gov/research/altstand/.

Agency for Healthcare Research and Quality (AHRQ). *Health Emergency Assistance Line and Triage Hub (HEALTH) Model*. Rockville, MD: AHRQ; March 2005. Available at: http://www.ahrq.gov/research/health/.

Agency for Healthcare Research and Quality (AHRQ). *Rocky Mountain Regional Care Model for Bioterrorist Events: Locate Alternate Care Sites During an Emergency*. Rockville, MD: AHRQ; December 2004. Available at: http://www.ahrq.gov/research/altsites.htm.

Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*. 2002;288(16):1987–1993.

Alexander GC, Werner RM, Ubel PA. The costs of denying scarcity. *Archives of Internal Medicine*. March 22, 2004;164(6):593–596.

Alexander GC, Wynia MK. Ready and willing? Physicians' sense of preparedness for bioterrorism. *Health Affairs*. September–October 2003;22(5):189–197.

American College of Emergency Physicians. Code of ethics for emergency physicians. *Annals of Emergency Medicine*. 1997;30:365–372.

American College of Emergency Physicians (ACEP). The duty to respond to out-of-hospital emergencies and disasters. *ACEP 2006 Policy Compendium*. Dallas: ACEP; 2006;35(3)(d).

American Hospital Association. *Hospital Preparedness for Mass Casualties*. August 2000. Available at: http://aharc.library.net/.

American Medical Association Council on Ethical and Judicial Affairs. Ethical considerations in the allocation of organs and other scarce medical resources among patients. *Archives of Internal Medicine*. 1995;155:29–40.

Barbera J, Macintyre A. *Medical and Health Incident Management System: A Comprehensive Functional System Description for Mass Casualty Medical and Health Incident Management*. Washington: George Washington University Institute for Crisis, Disaster, and Risk Management; December 2002. Available at: www.gwu.edu/~icdrm.

Barbera J, McIntyre A. *Medical Surge Capacity and Capability: A Management System for Integrating Medical and Health Resources During Large-Scale Emergencies*. Alexandria, VA: CNA Corporation; August 2004. Available at: http://www.cna.org/documents/mscc_aug2004.pdf.

Barbisch DF. *Surge Capacity: Seamless Emergency Medical Logistics Expansion System*. Presented at the National Disaster Medical System Conference, Dallas; 2004. Available at: http://ndms.chepinc.org/data/files/3/142.pdf.

Benson M et al. Disaster triage: START, the SAVE. *Prehospital and Disaster Medicine*. 1996;11:117–124.

Center for Law and the Public's Health – Georgetown and Johns Hopkins Universities. *Turning Point State Legislative Update Table*. Available at: http://www.publichealthlaw.net/Resources/Modellaws.htm#TP.

Centers for Disease Control and Prevention. Tiered use of inactivated influenza vaccine in the event of a vaccine shortage. *MMWR Weekly*. 2005;54:749–750.

Cheung TMT et al. Effectiveness of non-invasive positive pressure ventilation in the treatment of acute respiratory failure in severe acute respiratory syndrome. *Chest*. 2004;126:845–850.

Church J. *Modular Emergency Medical System – Expanding Local Healthcare Structure in a Mass Casualty Terrorism Event*. Washington: Department of Defense; June 1, 2002. Available at: http://www.nnemmrs.org/documents/.

Clarke SP, Sloane DM, Aiken LH. Effects of hospital staffing and organizational climate on needlestick injuries to nurses. *American Journal of Public Health*. 2002;92(7):1115–1119.

CNN.com. Sniper Fire Halts Hospital Evacuation: Gunmen fire at medical workers and patients at Charity Hospital. September 1, 2005. Available at: http://www.cnn.com/2005/WEATHER/09/01/katrina.hospital.sniper/index.html.

Cone DC, Koenig KL. Mass casualty triage in the chemical, biological, radiological, or nuclear environment. *European Journal of Emergency Medicine*. December 2005;12(6):287–302.

Cone DC, MacMillan DS. Mass-casualty triage systems: a hint of science. *Academic Emergency Medicine*. 2005;12(8):739–741.

Cook R, Cook D, Tilley J, Lee K, Marshall J; Canadian Critical Care Trials Group. Multiple organ dysfunction: baseline and serial component scores. *Critical Care Medicine*. 2001;29(11):2046–2050.

Dacey MJ. Tragedy and response – the Rhode Island Nightclub Disaster. *New England Journal of Medicine*. 2003;349:1990–1991.

Daniels N. Accountability for reasonableness. *British Medical Journal*. 2000;321:1300–1301.

Daniels N. *Am I My Patient's Keeper? An Essay on Justice Between the Young and Old*. New York: Oxford University Press, 1988.

Daniels N, Sabin J. *Setting Limits Fairly: Can We Learn to Share Scarce Medical Resources?*. New York: Oxford University Press; 2002.

Derse AR. Law and ethics in emergency medicine. *Emergency Medicine Clinics of North America*. 1999;17(2):307–325.

Diaz GG et al. Non-invasive positive pressure ventilation to treat hypercapneic coma secondary to respiratory failure. *Chest*. 2005;127;952–960.

Emanuel EJ, Wertheimer A. Public health. Who should get influenza vaccine when not all can? *Science*. May 12, 2006;312:854–855.

Eschun GM, Jacobsohn E, Roberts D, Sneiderman B. Ethical and practical considerations of withdrawal of treatment in the intensive care unit. *Canadian Journal of Anaesthesia*. 1999;46(5):497–504.

Federal Emergency Management Agency. *National Incident Management System*. Available at: http://www.fema.gov/emergency/nims/index.shtm.

Gomersall CD, Tai DY, Loo S, Derrick JL, Goh MS, Buckley TA, Chua C, Ho KM, Raghavan GP, Ho OM, Lee LB, Joynt GM. Expanding ICU facilities in an epidemic: recommendations based on experience from the SARS epidemic in Hong Kong and Singapore. *Intensive Care Medicine*. March 29, 2006;30:381–387.

Goold SD. Allocating health care: cost-utility analysis, informed democratic decision-making, or the veil of ignorance? *Journal of Health Politics, Policy, and Law*. 1996;21:68–97.

Gostin LO, Saprin JW, Teret SP, et al. The model State emergency health powers act. *JAMA*. 2002;288:622–628.

Greater New York Hospital Association. *Hospital Resources for Preparedness and Response*. Available at: http://www.gnyha.org/eprc/general/ics/.

Greater New York Hospital Association. *Security Planning Information for Hospitals*. Available at: http://www.gnyha.org/eprc/general/security/.

Grow R, Rubinson L. The challenges of hospital infection control in response to bioterrorist attacks. *Biosecurity and Bioterrorism*. 2003;1:215–220.

Health Resources and Services Administration. *Bioterrorism Hospital Preparedness Program 2006 Grant Guidance*. Available at: http://www.hrsa.gov/bioterrorism/default.htm.

Herridge MS. Prognostication and intensive care unit outcome: the evolving role of scoring systems. *Clinics in Chest Medicine*. 2003;24(4):751–762.

Hick JL, Hanfling D, Burstein JL, DeAtely C, Barbisch D, Bogdan G, Cantrill S. Healthcare facility and community strategies for patient care surge capacity. *Annals of Emergency Medicine*. 2004;44:253–261.

Hick JL, O'Laughlin DT. Concept of operations for triage of mechanical ventilation in an epidemic. *Academic Emergency Medicine*. 2006:13(2):223–229. Available at: http://www.aemj.org/cgi/content/full/13/2/223.

Iserson KV. Principles of biomedical ethics. *Emergency Medicine Clinics of North America*. 1999;17(2):283–306.

Iserson KV, Pesik N. Ethical resource distribution after biological, chemical, or radiological terrorism. *Cambridge Quarterly of Healthcare Ethics*. 2003;12:455–465.

Joint Commission on Accreditation of Healthcare Organizations (JCAHO). Disaster privileging standard. *Comprehensive Accreditation Manual for Hospitals*. Medical Staff Section MS.5.14.4.1. Oakbrook Terrace, IL: JCAHO; January 1, 2003.

Joint Commission on Accreditation of Healthcare Organizations (JCAHO). *Healthcare at the Crossroads: Strategies for Creating and Sustaining Community-Wide Emergency Preparedness Systems*. Oak Terrace, IL: JCAHO; 2004.

Joint Commission on Accreditation of Healthcare Organizations (JCAHO). *Surge Hospitals: Providing Safe Care in Emergencies*. Chicago: JACHO; 2006. Available at: http://www.jcrinc.com/generic.asp?durki=11627&site=11&return=http://www.ahrq.gov/research/altstand/405.

Joint Commission on Accreditation of Healthcare Organizations (JCAHO). *The 2001 Joint Commission Comprehensive Accreditation Manual for Hospitals*. EC 1.4 and 1.6 (rev). Oakbrook Terrace, IL: JCAHO; 2001.

Karnofsky DA. The use of nitrogen mustards in the palliative treatment of carcinoma. *Cancer*. 1948;1:634.

Katz S. Studies of illness in the aged. The index of ADL: a standardized measure of biological and psychosocial function. *JAMA*. 1963;185:914.

Kelen, G. Reverse triage: criteria for immediate inpatient disposition for creation of hospital surge capacity (abstract – 14th World Congress on Disaster and Emergency Medicine). *Prehospital and Disaster Medicine*. 2006;20(S1):S9–S10. Available at: http://pdm.medicine.wisc.edu/20-2%20PDFs/aedinburgh.pdf.

Koenig KL, Cone DC, Burstein JL, Camargo CA, Jr. Surging to the right standard of care. *Academic Emergency Medicine*. 2006;13(2):195–198.

Koenig KL, Dinerman N, Kuehl AE. Disaster nomenclature – a functional approach: the PICE system. *Academy of Emergency Medicine*. 1996;3(7):723–727.

Koenig KL, Goans RE, Hatchett RJ, Mettler FA, Jr., Schumacher TA, Noji EK, Jarrett DG. Medical treatment of radiological casualties: current concepts. *Annals of Emergency Medicine*. 2005;45(6):643–652.

Lanzilotti SS, Galanis D, Leoni N, Craig B. Hawaii medical professionals assessment. *Hawaii Medical Journal*. August 2002;61(8):162–173.

Larkin GL, Arnold J. Ethical considerations in emergency planning, preparedness, and response to acts of terrorism. *Prehospital & Disaster Medicine*. July–September 2003;18(3):170–178.

Larson EB. Scribner's legacy serves public good. *Seattle Post-Intelligencer*. July 9, 2003. Available at: http://seattlepi.nwsource.com/opinion/129982_scribner09.html.

Lemeshow S et al. Modeling the severity of illness in ICU patients: a systems update. *JAMA*. 1994;272:1049–1055.

Lemeshow S et al. Mortality probability models based on an international cohort of intensive care unit patients. *JAMA*. 1993;270:2478–2486.

Lemeshow S et al. Mortality probability models for patients in the intensive care unit for 48 or 72 hours: a prospective, multicenter study. Critical Care Medicine. 1994;22:1351–1358.

MacVittie TJ. Therapy of radiation injury. *Stem Cells.* 1997;15(Suppl 2):263–268.

Marshall JC, Cook DJ, Christou NV, et al. Multiple organ dysfunction score: a reliable descriptor of a complex clinical outcome. *Critical Care Medicine*. 1995;23:1638–1652.

McKneally MF, Dickens BM, Meslin EM, Singer PA. Bioethics for clinicians: 13. Resource allocation. *Canadian Medical Association Journal*. 1997;157(2):163–167.

Minnesota Department of Health (MDH). State/regional/local patient care responsibilities defined and outlined. *Patient Care Coordination Planning Guide*. Available on CD by request to the MDH Office of Emergency Preparedness: oep@health.state.mn.us.

Monchi M, Bellenfant F, Cariou A, Joly LM, Thebert D, Laurent I, Dhainaut JF, Brunet F. Early predictive factors of survival in the acute respiratory distress syndrome. A multivariate analysis. *American Journal of Respiratory & Critical Care Medicine*. October 1998;158(4):1076–1081.

Moreno R, Vincent JL, Matos R, Mendonca A, et al. The use of maximum SOFA score to quantify organ dysfunction/failure in intensive care. Results of a prospective, multicentre study. *Intensive Care Medicine*. 1999;25(7);686–696.

Needleman J, Buerhaus P, Mattke S, Stewart M, Zelevinsky K. Nurse-staffing levels and the quality of care in hospitals. *New England Journal of Medicine*. 2002;346(22):1715–1722.

Nickell LA, Crighton EJ, Tracy CS, Al-Enazy H, Bolaji Y, Hanjrah S, Hussain A, Makhlouf S, Upshur RE. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. *Canadian Medical Association Journal*. March 2, 2004;170(5):793–798.

Peres Bota D, Melot C, Lopes Ferreira F, Nguyen Ba, Vincent JL. The multiple organ dysfunction score (MODS) versus the sequential organ failure assessment (SOFA) score in outcome prediction. *Intensive Care Medicine*. 2002;28(11):1619–1624.

Pesik N, Keim ME, Iserson KV. Terrorism and the ethics of emergency medical care. *Annals of Emergency Medicine*. 2001;37(6):642–646.

Peters MJ, Tasker RC, Kiff KM, Yates R, Hatch DJ. Acute hypoxemic respiratory failure in children: case mix and the utility of respiratory severity indices. *Intensive Care Medicine*. 1998;24(7):699–705.

Pettila V, Pettila M, Sarna S, Voutilainen P, Takkunen O. Comparison of multiple organ dysfunction scores in the prediction of hospital mortality in the critically ill. *Critical Care Medicine*. August 2002;30(8):1705–1711.

Posner Z. Admi H. Menashe N. Ten-fold expansion of a burn unit in mass casualty: how to recruit the nursing staff. Disaster Management & Response. October–December 2003;1(4):100–104.

Public Engagement Pilot Project on Pandemic Influenza. *Citizen Voices on Pandemic Flu Choices*. Washington: National Academy Press; 2005.

Qureshi K, Gershon RR, Sherman MF, Straub T, Gebbie E, McCollum M, Erwin MJ, Morse SS. Health care workers' ability and willingness to report to duty during catastrophic disasters. *Journal of Urban Health*. September 2005;82(3):378–388.

Rizzo A, Colonel, USAF, MC, SFS Chief, Operations Division NORAD-USNORTHCOM/SG. *Deployable Oxygen Solutions for FEMA*. Briefing. Available at: http://www.denverhealth.org/bioterror/Document/DH2SupplyStaffing10-30-03.pdf (Appendix A).

Roccaforte JD. The World Trade Center attack. Observations from New York's Bellevue Hospital. *Critical Care*. 2001;5(6):307–309.

Rubinson L, Branson R, Pesik N, Talmor D. Positive pressure ventilation equipment for mass casualty respiratory failure. *Biosecurity and Bioterrorism*. 2006;4:1–12.

Rubinson L, Nuzzo JB, Talmor DS, O'Toole T, Kramer BR, Inglesby TV. Augmentation of hospital critical care capacity after bioterrorist attacks or epidemics: recommendations of the Working Group on Emergency Mass Critical Care. *Critical Care Medicine*. October 2005;33(10):2393–2403.

Sacco WJ, Navin DM, Fiedler KE, Waddell RK II, Long WB, Buckman RF, Jr. Precise formulation and evidence-based application of resource-constrained triage. *Academic Emergency Medicine*. 2005;12(8):759–770.

Saffle JR, Gibran N, Jordan M. Defining the ratio of outcomes to resources for triage of burn patients in mass casualties. *Journal of Burn Care & Rehabilitation*. November–December 2005;26(6):478–482.

San Mateo County Emergency Medical Services Agency. *Hospital Emergency Incident Command System III – January, 1998*. Available at: www.emsa.cahwnet.gov/dms2/heics3.htm.

Sever MS, Vanholder R, Lameire N. Management of crush-related injuries after disasters. *New England Journal of Medicine*. March 9, 2006;354(10):1052–1063.

Skidmore S, Wall W, Church J. *Modular Emergency Medical System Concept of Operation for the Acute Care Center: Mass Casualty Strategy for a Biological Terror Incident*. U.S. Department of the Army, Soldier and Biological Chemical Command. May 2003. Available at: http://www.nnemmrs.org/documents/.

Society of Critical Care Medicine Ethics Committee. Attitudes of critical care medicine professionals concerning distribution of intensive care resources. *Critical Care Medicine*. 1994;22:358–362.

Society of Critical Care Medicine Ethics Committee. Consensus statement on the triage of critically ill patients. *JAMA*. 1994;271:1200–1203.

State of Minnesota, Office of the Revisor of Statutes. *Minnesota Statutes 2006*, Chapter 12, 12.03 (Definitions). St. Paul: State of Minnesota; 2006. Available at: http://ros.leg.mn/bin/getpub.php?pubtype=STAT_CHAP_SEC&year=current&section=12.03

Tanabe P, Gimbel R, Yarnold PR, Kyriacou DN, Adams JG. Reliability and validity of scores on The Emergency Severity Index version 3. *Academic Emergency Medicine*. January 2004;11(1):59–65.

Tanabe P, Travers D, Gilboy N, Rosenau A, Sierzega G, Rupp V, Martinovich Z, Adams JG. Refining Emergency Severity Index triage criteria. *Academic Emergency Medicine*. 2005;12(6):497–501.

Tauber AI. A philosophical approach to rationing. *Medical Journal of Australia*. 2003:178(9):454–456.

Trachsel D, McCrindle BW, Nakagawa S, Bohn D. Oxygenation index predicts outcome in children with acute hypoxemic respiratory failure. *American Journal of Respiratory & Critical Care Medicine*. July 15, 2005;172(2):206–211.

Turai I, Veress K, Gunalp B, Souchkevitch G. Medical response to radiation incidents and radionuclear threats. *British Medical Journal. March 6, 2004;328:568–572.*

University of Toronto Joint Centre for Bioethics, Pandemic Influenza Working Group. *Stand on Guard for Thee: Ethical Considerations in Preparedness*. November 2005.

U.S. Department of Health and Human Services (HHS). *Food and Drug Administration Draft Guidance: Emergency Use Authorization of Medical Products*. Washington: HHS; June 2005. Available at: http://www.fda.gov/oc/bioterrorism/emergency_use.html.

U.S. Department of Health and Human Services. *HHS Pandemic Influenza Plan*. S3-III (A)(2)(h). Available at: http://www.hhs.gov/pandemicflu/plan/.

U.S. Department of Health and Human Services. *Hurricane Katrina: Waiver Under Section 1135 of the Social Security Act*. September 4, 2005. Available at: http://www.hhs.gov/katrina/ssawaiver.html.

U.S. Department of Health and Human Services. *National Disaster Medical System*. Available at: http://ndms.dhhs.gov/.

U.S. Department of Health and Human Services. *Pandemic Influenza Plan, Appendix D: NVAC/ACIP Recommendations for Prioritization of Pandemic Influenza Vaccine and NVAC Recommendations on Pandemic Antiviral Drug Use*. Available at: www.hhs.gov/pandemicflu/plan/appendixd.html.

U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA). *ESAR-VHP: Interim Technical and Policy Guidelines, Standards, and Definitions*, v. 2. June 2005. Available at: http://www.hrsa.gov/esarvhp/guidelines/default.htm.

U.S. Department of Homeland Security, Federal Emergency Management Agency. *Continuity of Operations (COOP) Programs*. Available at: http://www.fema.gov/government/coop/index.shtm#0

Van den Bos K, Lind EA, Vermunt R, Wilke H. How do I judge my outcome when I do not know the outcome of others? The psychology of the fair process effect. *Journal of Personality and Social Psychology*. 1997;72(5):1034–1046.

Venkataraman ST, Khan N, Brown A. Validation of predictors of extubation success and failure in mechanically ventilated infants and children. Critical Care Medicine. August 2000;28(8):2991–2996.

Vincent JL, Mendonca A, Cantraine F, et al. Use of the SOFA score to assess the incidence of organ dysfunction/failure in intensive care units: results of a multicenter, prospective study. *Critical Care Medicine*. 1998;26(11):1793–1800.

Vincent JL, Moreno R, Takala J, et al. The SOFA (sepsis-related organ failure assessment) score to describe organ dysfunction/failure. *Intensive Care Medicine*. 1996;22:707–710.

Wennberg JE, Fisher ES, Sharp SM, McAndrew M, Bronner KK (for the Dartmouth Atlas of Health Care Working Group). *The Care of Patients with Severe Chronic Illness: An Online Report on the Medicare Program by the Dartmouth Atlas Project*. Hanover, NH: The Dartmouth Atlas of Health Care; 2006. Available at: http://www.dartmouthatlas.org/atlases/2006_Chronic_Care_Atlas.pdf.

Chapter 6. Alternative Care Sites

Agency for Healthcare Research and Quality (AHRQ). *Reopening Shuttered Hospitals to Expand Surge Capacity*. Rockville, MD: AHRQ; March 2006. Available at: http://www.ahrq.gov/research/shuttered/. Accessed July 21, 2006.

Agency for Healthcare Research and Quality (AHRQ). *Rocky Mountain Regional Care Model for Bioterrorist Events: Locate Alternate Care Sites During an Emergency*. Rockville, MD: AHRQ; December 2004. Available at: http://www.ahrq.gov/research/altsites.htm. Accessed July 21, 2006.

Agency for Healthcare Research and Quality. *Alternative Care Site Selection Tool from Rocky Mountain Regional Care Model for Bioterrorist Events.* Available at: www.ahrq.gov/downloads/pub/biotertools/alttool.xls . Accessed July 21, 2006.

Barbera J, Macintyre A. *Medical and Health Incident Management System: A Comprehensive Functional System Description for Mass Casualty Medical and Health Incident Management.* Washington: George Washington University Institute for Crisis, Disaster, and Risk Management; December 2002. Available at: www.gwu.edu/~icdrm. Accessed July 21, 2006.

Church J. *Mass Casualty Strategy for Biological Terror Incidents: Neighborhood Emergency Help Center.* SBCCOM Department of the Army; May 2001. Available at: http://www.nnemmrs.org/documents/. Accessed June 12, 2006.

Church J. *Mass Casualty Strategy for Biological Terror Incidents: Acute Care Center.* SBCCOM Department of the Army; December 2001. Available at: http://www.nnemmrs.org/documents/. Accessed June 12, 2006.

Hick JL, Hanfling D, Burstein JL, DeAtely C, Barbisch D, Bogdan G, Cantrill S. Healthcare facility and community strategies for patient care surge capacity. *Annals of Emergency Medicine*. 2004;44:253–261.

Joint Commission on Accreditation of Healthcare Facilities (JCAHO). *Surge Hospitals: Providing Safe Care in Emergencies.* Chicago: JCAHO; 2006.

Joint Commission on Accreditation of Healthcare Facilities (JCAHO). *Faith-based Organizations as Partners in Emergency Management Planning, Response, and Recovery.* Chicago: JCAHO; 2005.

Lanzilotti SS. *Hawaii Medical Personnel Assessment 2003: A Longitudinal Study of Hawaii Doctors and Nurses, Their Knowledge, Skill, and Willingness to Treat Victims Related to Weapons of Mass Destruction and Naturally Caused Mass Casualty Incidents.* Honolulu: Honolulu Emergency Services Department; October 2004.

Trabert E, Giovachino M, et al. *After Action Review of Federal Medical Station (FMS) Operations During Hurricanes Katrina and Rita*. Washington: Department of Health and Human Services; 2006.

U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA). *Emergency Systems for Advance Registration of Volunteer health Professionals (ESAR-VHP) Program: Interim Technical and Policy Guidelines, Standards and Definitions,* v. 2. Rockville, MD: HRSA; June 2005.

Chapter 7. Palliative Care

Alexander D. Nature's impartiality, man's inhumanity: reflections on terrorism and world crisis in a context of historical disaster. *Disasters*. 2002;26(1):1–9.

Anonymous. Abstracts from the 14th World Congress for Disaster and Emergency Medicine. May 16–20, 2005. Edinburgh, Scotland. *Prehospital and Disaster Medicine*. 2005;20(3):s113–s151.

Anonymous. Elderly most in danger as hurricane strikes. SeniorJournal.com. September 2004. Available at: www.seniorjournal.com. Accessed July 12, 2006.

Anonymous. Louisiana nursing homes now vacated, many elderly feared dead. SeniorJournal.com. September 5, 2006. Available at: www.seniorjournal.com/NEWS/Eldercare/5-09-06NurseHomeRescue.htm. Accessed April 27, 2006.

Anonymous. More nursing home bodies being found after hurricane. SeniorJournal.com. September 16, 2005. Available at: http://www.seniorjournal.com/NEWS/Eldercare/5-09-16MoreBodies.htm. Accessed July 12, 2006.

Bankoff G. Rendering the world unsafe: "vulnerability" as Western discourse. *Disasters*. 2001;25(1):19–35.

Bauman A. Amidst hurricanes, blackouts, and floods.... how prepared is your hospice? *Insights*. September 2005:14–17.

Bierce A. The coup de grace. In: Ingram J, David C, eds. *The Collected Works of Ambrose Bierce, Vol. II: In the Midst of Life: Tales of Soldiers and Civilians*. San Francisco: PG Distributed Proofreaders; 2005.

Black R. Ethical codes in humanitarian emergencies: from practice to research? *Disasters*. 2003;27(2):95–108.

Brown V, Jacquier G, Coulombier D, Balandine S, Belanger F, Legros D. Rapid assessment of population size by area sampling in disaster situations. *Disasters*. 2001;25(2):164–171.

Center for Biosecurity of the University of Pittsburgh Medical Center. National strategy for pandemic influenza and the HHS Pandemic Influenza Plan: thoughts and comments. *Biosecurity and Bioterrorism: Biodefense and Strategy, Practice, and Science*. 2005;3(4):292–294.

Domres B. The challenge of crisis. *Pain Practice*. 2003;3(1):97–99.

Domres B, Manger A, Steigerwald I, Esser S. The challenge of crisis, disaster, and war: experience with UN and NGOs. *Pain Practice*. 2003;3(1):97–100.

Dyer BC. *The Impact of Natural Disaster on Older Adults: Lessons Learned from Hurricane Katrina*. American Geriatrics Society 2006 Annual Scientific Meeting.

Edwards JCP, Stapley J, Akins R. *Regional Strategies to Prepare for Public Health Disasters in Texas Offer Lessons About Community Resource Allocation*. Rockville, MD: Agency for Healthcare Research and Quality; 2005.

Health Systems Research, Inc. *Altered Standards of Care in Mass Casualty. Bioterrorism and Other Public Health Emergencies*. Rockville, MD:Agency for Healthcare Research and Quality; 2005.

Hearne SA, Segals LM, Earls MJ. *Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism*. Washington: Trust for America's Health, 2005.

Hersey J. Hiroshima. *The New Yorker*. August 31, 1946.

Homan P. Responding to crisis: a bereavement perspective. *Insights*. September 2005:35–37.

Homeland Security Council. *National Strategy for Pandemic Influenza*. Washington: Homeland Security Council; 2005.

Hooke WR, Rogers PG. *Public Health Risks of Disasters: Communication, Infrastructure and Preparedness – Workshop Summary*. Washington: National Institute of Medicine; 2005.

Institute of Medicine. *Preparing for the Psychological Consequences of Terrorism: A Public Health Strategy*. Washington: National Academies Press; 2003. Available at: http://www.nap.edu/openbook/0309089530/html. Accessed July 12, 2006.

Joint Commission on Accreditation of Healthcare Organizations (JCAHO). *Standing Together: An Emergency Planning Guide for America's Communities*. Chicago: JCAHO; 2005.

Light PC. *The Katrina Effect on American Preparedness*. New York: New York University Press; 2005.

McGough MF, Leer L, Tipton S, Tinker TL, Vaughn E. Communicating the risks of bioterrorism and other emergencies in a diverse society: a case study of special populations in North Dakota. *Biosecurity and BioTerrorism: Biodefense Strategy, Practice, and Science*. 2005;3(3):235–245.

National Center for Disaster Preparedness (NCDP) at Columbia's Mailman School of Public Health. More than $5 billion spent on bioterrorism preparedness, but Americans remain deeply concerned about safety and a majority lack confidence in government and health system to respond effectively. NCDP Web site. September 8, 2003. Available at: http://www.ncdp.mailman.columbia.edu/files/press_release.pdf. Accessed July 12, 2006.

National Defense Medical System (NDMS). *Report on the National Disaster Medical System 2005 Hurricane Response*. Reno, NV: NDMS; 2006.

Orr, R. D. "Ethical Issues in Bioterrorism." Bioterrorism email module #12, 2003. Retrieved April 27, 2006.

Pan American Health Organization. *Management of Dead Bodies in Disaster Situations*. Washington: Pan American Health Organization; 2004.

Pan American Health Organization. *Management of Dead Bodies After Disasters: A Field Manual for First Responders*. Washington: Pan American Health Organization; 2006.

Penner NR. Understanding the role of today's relief agencies and how best to work with them. *Insights*. September 2005: 30–34.

Perry RW, Lindell MK. Preparedness for emergency response: guidelines for the emergency planning process. *Disasters*. 2003;27(4):336–350.

Pupavac V. Therapeutic governance: psychosocial intervention and trauma risk management. *Disasters*. 2001;25(4):358–372.

Rioux P. St. Rita's owners say no help offered before Katrina hit. SeniorJournal.com. April 27, 2006. Available at: www.seniorjournal.com/NEWS/Eldercare/5-09-15StRitaNoHelp.htm. Accessed July 12, 2006.

Roy M. *Ten Steps in the Management of Biological Casualties on the Battlefield. USAMRIID's Medical Management of Biological Casualties*. Frederick, MD: U.S. Army Medical Research Institute of Infectious Diseases; 2001.

Saliba D, Buchanan J, Kingston RS. Disaster preparedness for vulnerable populations: the disabled, seriously ill or frail elderly. *American Journal of Public Health*. 2002;94:1436–1441.

Saliba DM, Buchanan J, Kington RS. Function and response of nursing facilities during community disaster. *American Journal of Public Health*. 2004;94(8):1436–1441.

Spiegel PB, Sheik M, Woodruff BA, Burnham G. The accuracy of mortality reporting in displaced persons camps during the post-emergency phase. *Disasters*. 2001;25(2):172–180.

Stanford University. The influenza pandemic of 1918. Stanford University Web site. Available at: http://www.stanford.edu/group/virus/uda/index.html. Accessed July 12, 2006.

Stoto M. Measuring Public Health Preparedness. Presented at the RAND Performance Measurement Seminar, Center for Domestic and International Health Security, Washington, May 18, 2006.

U.S. Department of Homeland Security (DHS). National Response Plan. Washington: DHS; 2004.

U.S. Department of Health and Human Services (DHHS). *Mental Health All-Hazards Disaster Planning Guidance*. DHHS Pub. No. SMA 3829. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration; 2003.

U.S. Department of Health and Human Services (DHHS). *Mental Health Response to Mass Violence and Terrorism: A Training Manual*. DHHS Pub. No. SMA 3959. Rockville, MD: Center for Mental Health Services, Substance Abuse and mental Health Services Administration; 2004.

U.S. Naval Reserve Commission. *Dirty bombs. Backgrounder*. April 2005:1–6.

U.S. Naval Reserve Commission. *Dirty Bombs*. Washington: Office of Population Affairs; 2006.

Viboud C. Interregional spread of influenza through United States described by virus type, size of population and commuting rates and distance. *NIH News*. April 19, 2006. Available at: http://www.nih.gov/news/pr/apr2006/fic-19.htm. Accessed July 12, 2006.

World Health Organization (WHO). Avian influenza – fact sheet. WHO Web site. January 15, 2004. Available at: www.who.int/csr/don/2004_01_15/en/print.html. Accessed July 12, 2006.

Wein LM, Craft DL. Evaluation of public health interventions for anthrax: a report to the Secretary's Council on Public Health Preparedness. B*iosecurity and Bioterrorism; Biodefense and Strategy, Practice, and Science*. 2005;3(4):348–356.

Chapter 8. Influenza Pandemic Case Study

American College of Physicians. The Health Care Response to Pandemic Influenza. *Annals of Internal Medicine.* 18 July 2006; 145 (2): 135-137.

Bartlett, John G. Planning for Avian Influenza. *Annals of Internal Medicine,* 18, July 2006, 145 (2): 141-144.

Gostin, Lawrence. Public Health Strategies for Pandemic Influenza. *JAMA,* 2006:295:1700-1704.

Institute of Medicine. *Hospital-based Emergency Care: At the Breaking Point.* Washington, DC: National Academies Press; 2006.

Osterhold MT. Preparing for the next pandemic. *New England Journal of Medicine.* 2005;352(18):1839–1842.

World Health Organization. *Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO.* Available at: http://www.who.int/csr/disease/avian_influenza/en/index.html. Accessed July 20, 2006.