

In the days following the tragic earthquake in Haiti, media reports focused on the time that was required to mobilize assistance for the people of Haiti, as well as on the huge death toll. The reports led many individuals to conclude that aid was being delayed due to bureaucracy and red tape. Most injuries and deaths in the immediate post-disaster phase are due to physical force trauma. Trauma is a surgical disease, and, as a result, surgeons are often called upon to serve as information sources for patients, friends, and colleagues.

The authors believe that a short review of some of the fundamental principles of disaster response would be helpful for surgeons seeking to understand and interpret media reports related to the situation in Haiti, as well as other disasters.

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questions and answers about disasters and disaster response

by Eric Frykberg, MD, FACS; Leonard Weireter, MD, FACS;
and Lewis Flint, MD, FACS

1 Why did it take so long for the disaster relief response to start working in Haiti?

Successful management of a disaster requires that local authorities have some level of preparedness. The resources to make certain that preparedness training was done were not available in Haiti. The authority to provide effective early command and control was eliminated by the damage to government buildings and infrastructure with resultant loss of communication capability. Roads were destroyed, so rescue and triage of casualties could not occur.

The first rescuers in all disaster events are always the people in the disaster area who were not hurt or killed. They can rescue some of the injured. However, without some response from government and health care agencies, evacuation and care of the injured will be delayed. This was clearly the case in Port-au-Prince. Help from adjoining geographic areas, such as other Haitian cities and the Dominican Republic, was not possible because passable roads were not available.

Medical facilities were damaged. Destruction of infrastructure and widespread communications failure rendered the Haitian government unable to exert effective leadership to coordinate the relief operation. The capacity to render care was impeded by the lack of capacity and materials necessary to treat the large number of wounded generated by the disaster. Ideally, triage is done at one or more points outside of the medical facilities and safely away from danger. When transport is done by “first rescuers” (as described in the opening paragraph), a large number of patients arrive at the nearest medical care facility. The first are typically the least severely injured, and if they are allowed inside the facility, the resources are quickly overwhelmed. Because there was no authority to enforce a plan to keep the least severely injured from entering the facilities, the facilities were overwhelmed.

This absence of a prevailing authority to coordinate all aspects of the response resulted in many rescue and medical teams operating independently and disjointedly, without knowledge of the “big picture,” although they no doubt have been rendering excellent care to the victims they have encountered.

The airport in Port-au-Prince was not functioning for an interval after the earthquake because air traffic control capability had been destroyed. After U.S. military personnel established air traffic control, the ability of incoming flights to arrive and depart was hampered by the availability of only one runway, and by a lack of fuelling facilities. The arrival of help by sea was hampered by virtue of the fact that the only docks available to receive ships had been destroyed by the earthquake.

Under the best of circumstances, for disasters that have occurred in the U.S., organized response and delivery of necessary supplies does not occur for a minimum of 96 hours after the disaster event occurs. Given the circumstances in Port-au-Prince—which included the loss of communication, damage to government organizations, damage to medical facilities, and lack of transport capability—the fact that many of the initial challenges have been met within one week of the disaster is impressive.

Thoughtful considerations of the situation that unfolded in Haiti should raise a number of questions about how well we are prepared for a similar event. These questions are intended to clarify what a disaster is and how we should think about preparation if we are to minimize the short and long-term consequences of any such event.

2 What is a disaster?

A disaster is a catastrophic event that disrupts the infrastructure of a community or society, to such a degree that they cannot cope with the consequences using routine methods or resources. In many ways, nothing will ever be the same, as disasters are typically associated with the tragedies of great loss of life and property, and a relatively long period of recovery. Disasters have been described as many people trying to do quickly what they do not normally do, working with people with whom they do not normally work, in an environment with which they are not familiar, and at a time and place that is completely unexpected.

However, the response to a disaster should not merely involve a mobilization of more personnel, supplies, and other resources. In fact, disaster management requires a new and different approach from our routine daily management of emergencies, because disasters pose unique problems and challenges rarely faced under normal conditions. The management response to a disaster must encompass many disparate elements that normally do not work together, and the people involved must suddenly cooperate with each other and foster a close working relationship in order to reach the common goal of establishing order out of chaos, and to minimize mortality and morbidity among the surviving victims. Because all disasters are sudden, unexpected, unpredictable, and random events, and because they are rare, they cannot be managed without established plans in place that are regularly rehearsed.

3 What makes a disaster different?

The most common feature of disasters, especially in terms of the medical management of casualties, is that the demand for resources outstrips the supply. This is a situation rarely, if ever, encountered in medical care in developed countries. The most common reason for this relative scarcity of resources is related to the large number of casualties that present all at once, which impedes the ability of medical providers to fully evaluate and treat each casualty and allocate available resources to those most in need, as we normally do. This situation is the most fundamental characteristic of a true “mass casualty event.” It should be distinguished from the more common “multiple casualty event,” otherwise termed “limited mass casualty event,” in which larger than normal numbers of injured victims present to a medical care facility, but are able to be handled with the resources at hand.

Successful management of the patients occurs even though it does involve extra work, some local mobilization, and straining of resources (for example, a busy weekend night in a major trauma center). A true mass casualty disaster must involve some level of rationing of resources to most accurately and effectively match needs with supplies, and must involve some mechanism for evacuation or redistribution of casualties to other facilities for full care, because by definition, all casualties cannot be handled locally. This requires a fundamental change in approach to the care of injured victims. A shift must occur from an orientation where there is a provision of the greatest good for each individual to the greatest good for the greatest number. The population, rather than the individual, must become the focus of medical care. It is not “business as usual, just busier.”

There may be casualties so severe that time and resource needs and requirements

may jeopardize the lives of many who are more salvageable. Unlike the normal approach to medical care, in which the most severely injured take first priority, the most severely injured of mass casualties may have to be set aside and treated last, so as to more efficiently apply the limited resources to many more. Evaluation of casualties must be rapid, decisions must be accurate in the context of the special requirements of mass casualty care, and traffic flow must be constantly moved forward in order to accommodate the influx of casualties and treat as many as possible. “Minimal acceptable care” is the standard in this setting, as optimal care for every casualty will lose many lives unnecessarily.

This, of course, is antithetical to the moral standards of health care providers, and therefore a circumstance that we never confront in our education, training, or routine medical practice. However, the longer it takes to learn this concept in an actual disaster, the more lives may be lost unnecessarily. The successful evaluation and management of mass casualties cannot be accomplished with our usual individualized approach to injured patients.

4 Why should we be concerned about disasters?

Disasters are relatively rare events, even though modern global communication makes us more aware of them. According to the Federal Emergency Management Agency, events with more than 1,000 casualties occur only a few times each century, and only 10–15 events each year result in more than 40 casualties. So, why should medical providers be at all concerned about these events? In fact, the idea that “it will never happen to me” is a major barrier to learning and training in the unique challenges of mass casualty management.

The following factors have the potential to result in large-scale natural and man-made disasters:

- Increasing population density, with its associated increased settlement in high-risk areas
- Increasing environmental degradation
- Increasing special needs populations
- Increase in the amount and transport of hazardous materials
- The emergence of new infectious diseases
- The increasing threat of terrorism

The health care sector is thus challenged with an increased likelihood of confronting mass casualty disasters in future years.

5 How may disasters be classified?

Table: Classification schemes for disasters

	Classification				
	Number of casualties	Mechanism	Nature of injuries	Extent and duration	Level of response required
Advantages	Allows facilities to prepare	Permits individualized plans	Allows accurate triage	Allows planning for supply and personnel recruitment	Allows for accurate planning
Disadvantages	Number often not known until days after event	Casualty types are usually similar in most disasters	Nature of injuries may not be important. Physical force trauma predominates.	Duration is frequently not known until after event	No real disadvantages

Disasters come in all shapes and sizes, and even similar types of disasters may involve very different variables, ones that can influence casualty outcomes. Therefore, the comparison of one disaster to another can be problematic. The Table on this page lists several methods of classifying disasters in order to gauge their magnitude.

The number of casualties is not very useful information in this context, due to the fact that the amount of casualties that overwhelm resources is relative. For example, five victims of a motor vehicle crash could be easily handled in an urban trauma center, but this number of casualties, presenting all at once, would overwhelm a rural hospital.

Injury patterns tend to be similar in the various natural and man-made mechanisms (for example, the earthquake in Haiti or the attack on the World Trade Center), as well as in specific types of injuries within each mechanism. Geographic and time elements pose distinct challenges and implications for the medical response to disasters. “Open disasters” are those occurring over a wide geographic area, such as a tornado that goes across an entire

state, while “closed disasters” are those in a discrete location with an easily defined scene, such as an urban building collapse.

Disasters can also be classified in terms of time. “Finite disasters” are those occurring at one point in time, such as a building collapse, from which all consequences follow, while “ongoing disasters” involve continuing damage and dangers, such as a leaking gas main that explodes and causes a fire, the aftershocks following an earthquake that continue for days or weeks, or armed conflicts. The most useful categorization scheme classifies disaster events according to the level of response needed to cope effectively with the event. This classification system works because the mismatch between needs and resources is the element that most fundamentally defines a disaster.

6 What is disaster preparedness?

Active involvement in the process of planning for a disaster, such as engaging in hospital drills and community exercises, and learning fundamental disaster principles and putting them into practice—and educating and engaging others in these activities—are the fundamental elements of disaster preparedness. This includes not only readying one’s hospital, community, and region for potential disaster events, but also preparing oneself and one’s own family for the many challenges that disasters pose. Preparedness should not only be directed at the management of the acute phases of a disaster response, but also for the very difficult long-term management phases of recovery, rebuilding, and return to normal.

7 What are the elements of a disaster response?

Effective disaster response begins with planning. Without local and regional plans based on sound analyses of all likely hazards, no organized response can occur. One “all-hazards” plan that encompasses a generic approach to the common challenges of all disasters is more effective than multiple plans addressing individual types of disasters. Plans should include inventories of local resources, arrangements for redundant communications systems (telephones, internet, and cell phones immediately fail during a disaster), and designation of roles for each of the following: government, health care, police, emergency medical services, food and water suppliers, and heavy equipment operators, to name only a few.

After planning comes education and training. These efforts involve working through scenarios (also known as rehearsals) of various hazardous events until everyone is familiar with their respective role, and lines of communication are established. Planning, education and training, and rehearsals are expensive. This fact probably explains why poor countries have little in the way of preparedness for disasters.

8 How should health care facilities prepare for disaster response?

Success or failure is determined by how well the institution can deal with the rapidly changing disaster situation. The command structure is an essential element that must be designated, and must be recognized by all participants of the response team. The many independent and disparate entities involved in a disaster response cannot function effectively without being willing to answer to one authority. The Incident Command System (ICS) has been used for this purpose in the U.S., as it has proven to fulfill the major command and control requirements in numerous disasters. All participants of any disaster response should have training in this system.

The ICS, with its core functions of planning, operations, logistics, and finance, allows the health care facility to organize the response and utilize workers and materials in the most efficient manner possible. The additional key functions of acting as the liaison to other responding agencies, provision of victim and caregiver safety, and dissemination of public information, round out the essence of the ICS. This is a system that requires training, and it should not be operated *de novo* or by novices. For a fuller discussion of this topic and a list of comprehensive educational materials, go to this Web site: <http://training.fema.gov/IS/crslst.asp>.

Disaster plans for health care facilities include plans for maintenance of forward-flow of casualties from triage to emergency assessment, and from there to the operating room, intensive observation area, routine observation area, and transfer to another facility or discharge. Ideally, the hospital should “lock down” on notification of the disaster event. Triage and decontamination stations are located away from the emergency treatment areas.

Teams of caregivers organized to perform initial assessment and care report to

a medical control officer in the emergency reception area. This individual works with a representative of the hospital emergency response management group to coordinate communications, supply, and personnel. Choke points in hospitals include laboratory and radiology. Protocols for injury assessment and management that do not require lab or radiology are important. Clinical assessments conducted during a mass casualty event are not perfect, and provision is made for repeat assessments. Intensive care areas rapidly fill, so other areas where monitored beds are available should be identified. Some potential areas are endovascular surgery, endoscopy, and day surgery facilities. Patients who will survive if an airway is obtained and/or bleeding is stopped go immediately to the operating suite. Patients who need observation can be watched by nonsurgeon medical personnel. Personnel who are going to transport patients need to know where they are going, and this knowledge is developed during rehearsals. Dining areas should be reserved for feeding staff, and should not be converted into patient care areas.


A sad fact of mass casualty events is that most patients go to the nearest hospital. A perfect plan would include provision for “leap-frogging” to facilities that are more distant. Even if such a plan is in place, it almost never functions effectively in the early phase following a disaster event. As a substitute, health care facilities should have communication and transfer agreements with nearby facilities. Hospital supply inventories are kept at minimal levels for financial reasons. Caches of emergency supplies are important components of each emergency plan.

9**What is the role of health care providers in a disaster response?**

Physicians and surgeons should participate fully in planning, education, and rehearsals, as they will be the first receivers of most disaster casualties and, therefore, must function as an integral part of the overall disaster response. Specific roles for nonsurgeon providers will need to be developed. Medical staff members need to stay in the hospital and away from the scene of the disaster event.

10**How can I become involved in disaster response?**

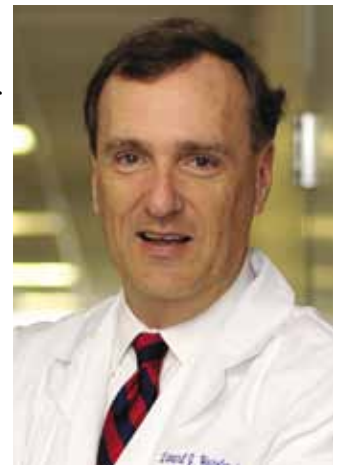
Consult the disaster management community on the American College of Surgeons Web portal at <http://www.efacs.org>. Involvement in a disaster response is best accomplished through a long-term commitment to a variety of relief organizations, medical teams, or the military. These entities provide extensive training in the concepts and procedures of disaster planning and management, safety, command and control, and disaster casualty care, and they provide abundant experience with the collection and dispersal of needed resources.

Running into a disaster setting with noble intentions of helping, but without this education, training, and experience, tends to fail, is potentially dangerous, and adds a further burden to an already overwhelmed setting. Those without this experience can best help through support of relief organizations and by remaining in their hospitals to help care for victims who are transported to the U.S. 

Dr. Frykberg is professor of surgery, University of Florida College of Medicine, and chief, division of general surgery, Shands Medical Center, Jacksonville, FL.



Dr. Weireter is Arthur and Marie Kirk Family Professor of Surgery and chief, division of trauma and critical care, Eastern Virginia Medical School, Norfolk, VA. He is Chair of the ACS Committee on Trauma ad hoc Disaster and Mass Casualty Management Committee.



Dr. Flint is Editor-in-Chief of the College's Selected Readings in General Surgery.

