A Framework for Catastrophic Disaster Response

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THE JAPANESE TSUNAMI, HAITIAN EARTHQUAKE, AND GULF Coast hurricane offered stark reminders of how vulnerable organized societies are to catastrophic events. They also show how public health emergencies—whether naturally occurring (eg, a pandemic outbreak of novel influenza) or deliberate (eg, a terrorist attack using an improvised nuclear device)—will stress the health system beyond its current capacity. This will require a health and medical response that is fundamentally different from the status quo.

Health systems are designed and organized to provide optimal care for ill or injured patients as well as to provide care to additional patients following a large-scale incident. Most health systems have enough surge capacity to respond effectively to conventional disasters such as a plane crash or building collapse. However, health care delivery systems and public health lack the infrastructure, resources, and capability to effectively respond to a catastrophic event.

The 3 critical components of catastrophic disaster preparedness are development of crisis standards of care, development of a "systems" approach that ensures integration among key stakeholders, and meaningful engagement with health professionals and the public.

Crisis Standards of Care

Public health disasters may justify temporarily adjusting practice standards and shifting the balance of ethical concerns to emphasize the needs of the community, while still providing the best possible care for individuals within an environment of significant resource constraints. During the 2009 influenza A(H1N1) pandemic, the Institute of Medicine issued a guidance report that urged the development of uniform plans by states generalized to all crisis events. The report defined crisis standards of care as "the optimal level of health care that can be delivered during a catastrophic event, requiring a substantial change in usual health care operations."[1]

Crisis standards of care provide a mechanism for responding to situations in which the demand on needed resources far exceeds resource availability.[2] Implementation of crisis standards of care involves a substantial shift in normal health care activities and reallocation of staff, facilities, and resources. To transition quickly and effectively, each organization and agency has a responsibility to plan and identify in advance the core functions it must carry out in a crisis and who will be responsible for each task. Emergency medical services agencies, for example, will have to limit the number of patients who are transported to hospitals, whereas hospitals will have to prioritize the types of services provided.

A Systems Approach

Crisis standards of care are just one aspect of broader disaster planning and response. Indeed, crisis standards of care planning is an extension of surge capacity and capability planning that has progressed over the past decade. However, existing efforts have focused principally on hospitals and public health agencies.[3,4] A systems approach ensures that all stakeholders follow consistent protocols that consider legal and ethical considerations when crisis standards of care take effect.[5]

A systems approach depends on "horizontal" coordination and integration across the full spectrum of stakeholders. Each key stakeholder—hospitals and outpatient clinics, public health departments, emergency medical services, public safety agencies, and government offices—plays distinct, crucial roles. Yet despite the importance of developing well-coordinated plans, few communities have the level of integration necessary to provide oversight and care for an overwhelming number of victims and survivors.

Lack of coordination in planning will significantly affect critical decisions during a catastrophic event, such as when patients can be taken to alternate care facilities, whether resources will be available to provide tertiary care, and how outpatient and hospital care can be effectively integrated. However, much of the planning for large-scale emergencies remains discipline specific and not inclusive of broad, coordinated planning efforts.

Beyond horizontal integration of key stakeholders, national preparedness requires vertical integration among numerous agencies at the federal, state, tribal, and local levels. All levels of government should take steps to ensure consistency and coordination of partners involved in emergency responses to disasters and should weave crisis standards of care into their surge capability planning and training exercises.

Each level of government has a vital role to play, ensuring coordination among agencies. The federal government is responsible for countrywide guidance; allocating national stockpiles of vaccines, medicines, and medical equipment; and providing leadership to ensure a consistent national approach.

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Key federal agencies should take measures to support this collaboration. States are sovereign governments with the responsibility and constitutional authority to safeguard the health of their inhabitants. Governors can declare a public health emergency, thus enabling state agencies to make crisis standards of care determinations, set professional practice standards, and ensure capacities for planning and response to disasters. Local governments are geographically close to the populations they serve, adapting standards and resources to conditions within communities.

Ethical and Legal Foundations

Plans and protocols that shift desired patient care outcomes from the individual level to the population level must be grounded in the ethical allocation of resources. An ethical policy does not require that all persons are treated in an identical fashion, but does require that differences in treatment are fair and equitable. In allocating scarce resources, for example, should children be given priority? Should elderly or terminally ill patients be removed from mechanical ventilator assistance to support the care of other patients who might benefit?

If particular groups receive favorable treatment, such as access to vaccines or medical management with critical care resources, this priority should stem from relevant factors, such as greater exposure or vulnerability and should promote important public health and community goals, such as helping first responders or other key personnel stay at work.

Delivering health care in the midst of catastrophic destruction requires adherence to ethical norms, despite the ease with which those norms may be sidestepped because the health care professional's understandable concern for the individual patient. Decisions must be transparent and planning should facilitate the fair allocation of scarce resources. Ethical allocation should bring better care to more patients, prioritizing those most likely to benefit particularly the most at-risk and marginalized populations, such as persons with mental or physical disabilities.

Whether the disaster is a sudden onset no-notice event, such as the Tohoku earthquake and tsunami, or a gradual onset, sustained event, such as pandemic influenza, planning is critical to a successful outcome. In Haiti, for example, surgeons performed numerous amputations, despite the absence of physical therapy and rehabilitation capabilities. Patients found it difficult to ambulate with crutches due to the hilly terrain. Surgical decisions lacked sensitivity to Haitian culture, whose indigenous religious values consider amputation a bodily mutilation. Advance planning establishing clear indications for surgery and long-term patient follow-up could have avoided the harms perceived by the local population.

In supporting ethical decision making, the legal system must afford health care professionals reasonable freedom from post hoc legal scrutiny. Without reasonable protection, fear of retroactive legal penalties could deter practitioners from rendering care when the need is greatest. During a mass disaster, health care professionals may have to remove limited medical resources from a single patient or group of patients to support another group of patients. These dire clinical choices are unprecedented, and professionals may hesitate to make them in the absence of reasonable legal protections.

Professional and Public Engagement

Decision making around issues of such magnitude—essentially who shall live and who might die—cannot be imposed on an uninformed public. As part of an overall focus on community and national resiliency, the public must understand and provide meaningful input into allocation decisions. Policy makers should involve the public during the planning process in a structured dialogue about ethical allocation of scarce resources during a catastrophic disaster.

Public engagement, however, cannot be separated from the importance of gaining the understanding and support of health care professionals in the frontlines of delivering care. Physicians, nurses, and other emergency medical services personnel will have to implement disaster plans in agonizing circumstances, and they will have to communicate sensitively to their patients. Moreover, in a large-scale catastrophe, they may not be given the choice to volunteer their services—all health care professionals will be needed to meet the inevitable surge in demand.

Although society should make every effort to avoid triage and rationing, at some point doing so may become necessary. To reduce morbidity and death, and to ensure democratic accountability, the government and health system at every level will need to plan carefully, adopt ethically rigorous standards, and meaningfully engage professionals. What is most important is that government and stakeholders—from local communities to states and nationally—design and test a rigorous response well in advance of a major disaster.

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REFERENCES

1. *Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations.* Washington, DC: National Academies Press; 2009.
2. Gostin LO, Hanfling D. National preparedness for a catastrophic emergency: crisis standards of care. *JAMA*. 2009;302(21):2365-2366.
3. *Medical Surge Capacity and Capability: A Management System for Integrating Medical and Health Resources During Large Scale Emergencies.* 2nd ed. Washington, DC: US Dept of Health & Human Services; 2007.
4. Hick JL, Barbera JA, Kelen GD. Refining surge capacity. *Disaster Med Public Health Prep*. 2009;3(2)(suppl):S59-S67.
5. *Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response.* Washington, DC: National Academies Press; 2012.