Ambulances to Nowhere:
America's Critical Shortfall in
Medical Preparedness for Catastrophic Terrorism

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The concern for large-scale terrorism resulting in mass casualties has grown steadily among the law enforcement and intelligence communities in the United States over the past decade.[1] Media coverage spotlighting this concern has raised the general public's awareness of the potential human consequences of an attack against unprotected civilians with weapons capable of widespread damage (known as weapons of mass destruction or WMD).[2] Although law enforcement and security capabilities are being enhanced to prevent acts of terrorism, not all of these events can be prevented, as the attacks on the Murrah Federal Building in Oklahoma City and the World Trade Centers in New York City, the sarin attack in the Tokyo subway, and numerous biological terrorism hoaxes make clear.[3] The general public expects adequate preparedness for consequence management by the emergency response community. A key component of consequence management is timely and appropriate medical care for victims of mass casualty incidents.

As concerns for WMD terrorism rise,[4] incorrect assumptions are being made about existing medical capabilities to treat mass casualties. In reality, hospital surge capacity and specialized medical capability across the United States has never been more restricted. While the public and the political communities assume that the healthcare systems are adequately preparing for terrorism incidents that would generate catastrophic casualty loads, the medical community is struggling just to maintain its everyday capacity. This paper outlines the current financial issues that restrict adequate hospital preparedness for mass casualty events, and proposes model approaches for the United States to address this preparedness shortfall. Without prompt action, the nation carries the risk that victims of a mass-casualty disaster might end up in "ambulances to nowhere."

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[1] Gilmore Commission, "Assessing the Threat: First Annual Report to Congress of the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction" (Washington, D.C., December 15, 1999). National Intelligence Estimate (NIE) 1999, "The global infectious disease threat and its implications for the United States," NIE 99-17D, Washington, D.C., January 2000.

[2] V. Loeb, "Global threats against U.S. will rise, report predicts," *The Washington Post*, December 18, 2000, pp. A3–A4; J.P. Pinkerton, "We face war by terrorism, ready or not," *Long Island Newsday*, October 26, 2000, p. 45, accessed October 27, 2000 <ebird.dtic.mil/Oct2000/e20001027priorities.htm>.

[3] S. Horowitz, "B'nai B'rith package contained common bacteria," *The Washington Post*, April 29, 1997, p. B2; Editorial, "Bioterrorism alleging use of anthrax and interim guidelines for management — United States, 1998," Centers for Disease Control (CDC) *Morbidity and Mortality Weekly Report*, No. 48 (1999), pp. 69–74.

[4] Gilmore Commission, "Toward a National Strategy for Combating Terrorism: Second Annual Report to Congress of the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction" (Washington, D.C., December 15, 2000).

HISTORICAL PERSPECTIVE: PUBLIC-TRUST OBLIGATIONS OF HOSPITALS

During the twentieth century, the delivery of acute medical care in the United States evolved beyond an ordinary business relationship to become a "trust" with patients.[5] The specialty of emergency medicine, which grew rapidly from its founding thirty years ago, has become a major component of this trust. Emergency medical services (EMS) have also evolved in the United States. EMS is expected to rapidly transport patients to the hospital, and once patients reach the hospital, it is expected that they will receive the best care possible. Thus, the "trust" expectation is extended to the hospital itself.[6] The Hippocratic oath, the legal requirement to provide emergency medical care for everyone regardless of ability to pay,[7] the high esteem in which society holds physicians, nurses, and other medical personnel, the daily media headline reports of breakthroughs in health research, and the severity of judicial malpractice remedies for breach of medical standards are all evidence of the public's medical care expectations.[8]

The general public, and public policy, has traditionally extended expectations concerning available health care to include the disaster scenario. They have assumed that hospitals have an inherent obligation to the community for disaster preparedness. Justification for this assumption has included the following rationales:

- The concept of "medicine as a trust" has been extended from the individual patient to apply to the community as a whole.
- Financial support to hospitals by the community, including fund-raising, municipal subsidies, and federal, state and corporate grants, create an expectation that hospitals will address the community's comprehensive health and medical needs, including disaster preparedness.[9]
- A reasonable cost for hospital preparedness for mass casualties was assumed to be a necessary cost of doing hospital business, and was passed on through the fee-for-service

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[5] R. Flaste, R. Coles, P. Moffitt, *Medicine's Great Journey: One Hundred Years Of Healing* (Boston/Toronto/London: Little, Brown and Company, 1992), pp. 43–84.

[6] J.R. Griffith, *The Well-managed Healthcare Organization*, 4th ed. (Chicago: Health Administration Press, 1999), p. 8.

[7] Emergency Medical Treatment and Labor Act, 42 CFR 20.

[8] ibid.

[9] Griffith, *The Well-managed Healthcare Organization*, p. 6.

> system, through which Medicare and private insurance payments were handled until the 1990s . This hospital-generated, cost-basis billing allowed the costs of all medical functions, including emergency preparedness, to be recovered through payment for regular medical services.

This presumed obligation of hospitals towards community preparedness has even become incorporated into public policy and is reflected in current laws and regulations. For example, Title III of the Superfund Amendment and Reauthorization Act of 1986 (SARA) established Local Emergency Planning Committees (LEPCs) to address risks generated by hazardous materials (HazMat) in every community in the United States.[10] The LEPC guidelines recommend that an individual local hospital be designated as a receiving facility for contaminated chemical casualties in at-risk communities. However, they do not specify how the development and maintenance of this expensive capability will be financed. Another example can be seen in The Health Care Financing Administration's Medicare Certificate of Participation Agreement. This stipulates that, for any hospital providing full-time emergency services, "there must be adequate medical and nursing personnel qualified in emergency care to meet the written emergency procedures and needs anticipated by the facility."[11] Again, the cost of such surge capacity to meet anticipated needs is not addressed. A further example of unfunded requirements that hospitals face is incorporated into the preparedness standards of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).[12] While the regulations provide valuable incentive for hospitals to perform some preparedness activity, they do not provide funding mechanisms. Hospitals therefore rarely give these issues the attention necessary to meet requirements for a major emergency.

There appears to be very limited understanding of these mass-casualty medical care issues by the general public, the emergency response community, and policymakers. Instead, hospital operations are often perceived to function within a "black box": patients are admitted, obscure but high quality medical care is

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[10] Superfund Amendment and Reauthorization Act of 1986 (also known as the Emergency Planning and Community Right to Know Act, EPCRA, 42 USC 11001); SARA Title III description accessed May 1, 2001, at: <aepo-xdv-www.epo.cdc.gov/wonder/prevguid/p0000018/p0000018.asp#head004004000000000>.

[11] 42 CFR 482.55(b) (2).

[12] "Emergency Management," Joint Commission on Accreditation of Healthcare Organizations Standard EC.1.4JCAHO, accessed May 1, 2001, at <www.jcaho.org/standards_frm.html>.

somehow provided, and the best possible outcome is expected.[13] It is thus presumed that even if a large number of patients were brought simultaneously to a hospital, they would receive the same high-quality care as the individual patient does under regular hospital conditions. This confidence in today's health care system, however, is unfounded.

In a time when catastrophic terrorism is increasingly considered to be a significant risk, close examination of hospital preparedness capabilities reveals troubling issues. Historical expectations of casualty loads generated by traditional community disasters, such as transportation accidents, can best be described as "multiple casualties" rather than "mass casualties": expectations have been for numbers in the teens, not thousands, and planning has been performed accordingly. Mass terrorism casualty loads are, however, likely to be very much greater.[14] In addition, traditional expectations of the type of casualty have focused on general trauma victims. Specialty casualties due to exposure to chemical, biological, or radiological weapons were rarely considered in the context of large numbers. For example, recent JCAHO regulations mandated only enough HazMat preparedness to manage just a single contaminated casualty.[15] Consideration must also be given to the special circumstances of chemical, biological, and radiation casualties. Among other dangers, contamination or infection from the victims may actually put healthcare providers at risk.[16] And finally, further complexity is added by the recognized danger that hospitals themselves might well be primary or secondary targets of terrorism.

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[13] J.A. Barbera, "The role of hospitals and the medical care system in chemical/biological terrorism," keynote panel presentation, Domestic Preparedness (Terrorism) National Stakeholders' Forum, Department of Justice; August 27, 1998, Washington, D.C.

[14] H. Nozaki, N. Aikawa, Y. Shinozawa, et al., "Sarin gas poisoning in the Tokyo subway," *Lancet*, No. 345 (1995), pp. 980-981; *Top Officials (TOPOFF) 2000 Exercise Observation Report*, Vol. 2: *State of Colorado and Denver Metropolitan Area*, Prepared by the Office for State and Local Domestic Preparedness Support (OSLDPS), Office of Justice Programs (OJP), Department of Justice (DOJ), and the Readiness Division, Preparedness Training, and Exercises Directorate (PT&E), Federal Emergency Management Agency (FEMA) (Washington, D.C.), draft document circulated December 2000; T. Inglesby, "Lessons from TOPOFF," Presentation made at "The Second National Symposium on Medical and Public Health Response to Bioterrorism," Washington, D.C., November 28, 2000.

[15] Joint Commission, *Comprehensive Accreditation Manual for Hospitals* (Oakbrook Terrace, IL: Joint Commission of Healthcare Organizations, January 1998).

[16] R.J. Geller, K.L. Singleton, et al., "Nosocomial Poisoning Associated with Emergency Department Treatment of Organophosphate Toxicity, Georgia 2000," January 5, 2001, CDC, *Morbidity and Mortality Weekly Report*, Vol. 49, No. 51"], pp. 1156–8, accessed January 8, 2001, at <www.cdc.gov/mmwr/preview/mmwrhtml/mm4951a2.htm>; D.A. Henderson, "The Looming Threat of Bioterrorism," *Science*, February 26, 1999, Vol. 283 pp. 1279–1282.

Healthcare systems are only now beginning to adjust to each of these newly perceived threats, and to recognize the vast shortfalls in preparedness. Hospitals are often unprepared for even a few chemically contaminated casualties.[17] They are "woefully unprepared" for biological or chemical terrorism.[18]

CURRENT MEDICAL ECONOMIC REALITIES: COUNTER-INCENTIVES TO PREPARATION

The assumptions used historically to justify the healthcare system's responsibility for disaster casualties have changed drastically over the past ten years. The predominant reimbursement system for medical care has substantially transitioned from fee-for-service to an externally imposed, charge-based system. Managed-care payments for services are now controlled by strict contract, and often are not adequate to cover the total cost of providing even *regular* medical care (i.e., capital costs in addition to actual medical care costs). Federal regulations have changed the basis of Medicare and Medicaid payments from "costs incurred" to "charges allowed," and have strictly enforced limits on hospital billing for services. The 1997 Balanced Budget Amendment severely curtailed longstanding federal financial support for medical training programs, including those that had supported the trauma center capability in many jurisdictions.[19]

While hospital and physician charges have been constrained, no similar external controls have been applied to their business costs. New equipment acquisition, recently developed medications, capital construction, and facility maintenance have become increasingly expensive. Other adverse factors over the past decade have further increased the economic burden on the healthcare community, including:

- a decline in government support for public and private hospitals;[20]
- an increasing number of expensive, unfunded, or under-funded regulatory mandates;[21]

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[17] D. Cone D and S. Davidson, "Hazardous materials preparedness in the emergency department," *Prehospital Emergency Care*, No. 1 (1997), pp. 85–90.

[18] S. Burling, "Study says emergency rooms unprepared for terrorism," *Philadelphia Inquirer*, October 25, 2000, accessed October 26, 2000, at <web.philly.com/content/inquirer/2000/10/25/city/ER25.htm>.

[19] The 1997 Balanced Budget Amendment, Public Law 105-33. C. Goldberg, "Teaching hospitals battle Medicare-money cuts," *New York Times*, May 6, 1999, accessed June 4, 2001, at <archives.nytimes.com>. Editorial, "Teaching hospitals in trouble," *New York Times*, May 31, 1999, accessed June 4, 2001, at <archives.nytimes.com>; J.K. Inglehart, "Support for academic medical centers: revisiting the 1997 Balanced Budget Act," *New England Journal of Medicine*, Vol. 341, No. 4, July 22, 1999, pp. 299–304.

[20] Editorial, "Help the hospitals," *St. Petersburg Times*, March 24, 2001.

- a continued expectation that hospitals will maintain high levels of charity medical care; [22] and
- a national shortage of nurses for acute care hospitals, resulting in the need for special compensation packages to attract personnel.[23]

These conditions have created severe financial stress in the hospital industry. Few hospitals now have comfortable operating margins.[24] Many hospitals have been forced to close, downsize, consolidate, reconfigure, or — in the case of non-profits — to "partner" with for-profit hospital corporations. These changes have led to the abolition or downsizing of specialty services crucial to disaster preparedness, including emergency departments and trauma centers.[25] Hospitals undergoing renovation or building new facilities are doing so only to meet daily operational needs, with no provision for extraordinary surge capacity or disaster casualty care. The military medical system has undergone similar transformations, including downsizing.

CURRENT STATE OF HOSPITAL PREPAREDNESS FOR MASS/SPECIALTY CASUALTIES

This healthcare system financial crisis directly affects preparedness for mass casualty incidents in multiple ways. For example, most hospitals now use "just-in-time" inventory systems that provide for the minimum on-site storage of sterile supplies, vital equipment, and pharmaceuticals to meet immediate requirements.[26] This severely curtails what is available at any one moment to be used during a hospital

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[21] American Hospital Association, "Hospital preparedness for mass casualties: summary of an invitational forum," Washington, D.C., August 2000, <www.aha.org>.

[22] B. Herbert, "In America: hospitals in crisis," *New York Times*, April 15, 1999, accessed June 4, 2001, at <archives.nytimes.com>.

[23] R. Sorelle, "Ratios pit nurses against hospitals, doctors," *Emergency Medicine News*, Vol. 23, No. 3 (April 2001), pp. 1, 26, 29; M.C. Jaklevic, and E. Lovern, "A nursing code blue," *Modern Healthcare*, December 11, 2000, pp. 42-44; W. Scott, "Nurse workforce: condition critical," *National Health Policy Forum Issue Brief* (Washington, D.C.: National Health Policy Forum, June 1, 2001), p. 763.

[24] American Hospital Association, "Hospital preparedness for mass casualties: summary of an invitational forum."

[25] R. Sorelle, "Crisis Pushes California EDs to the Breaking Point: Fifty California emergency departments closed since 1990, leaving only 355, and 80% of those lost money in 1999, a total of $315 million statewide," *Emergency Medicine News*, Vol. 23, No. 30, April 2001, pp. 58–60.

[26] P.I. Buerhaus and D.O. Staiger, "Trouble in the nurse labor market? Recent trends and future outlook," *Health Affairs*, Vol. 18, No. 1, January/February 1999, pp. 214-222.

response to a mass casualty event. Re-supply and "back-up" mechanisms are often shared by all local and regional medical institutions: a community's hospitals all count the *same* capability as their individual surge capacity.

Hospitals have also restructured their workforce, with a decline in the ratio of trained healthcare workers to patients, resulting in a marked increase in individual workload.[27] This is particularly evident in the dramatically higher patient-to-nurse staffing ratios that have developed over the past decade. The daily workload stress has caused a striking increase in personnel turnover, resulting in a decline in level of experience of hospital personnel.[28] This is further exacerbated by the heavy use of "agency" or temporary staff for the nursing workforce: these personnel are often unfamiliar with an individual hospital's emergency preparedness procedures. More worrisome is that these personnel often have commitments to multiple hospitals in any individual region; this could result in a serious shortfall of staffing when surge capacity is needed.

Hospitals are experiencing increasing difficulties maintaining rosters of immediately available medical specialists.[29] Administrative hospital positions have also been reduced in number, with a resultant increase in the administrative burden on remaining personnel. Limited time and attention remains for emergency preparedness activities, and it can be overly taxing for individual institutions to participate in even low-key, pre-planned exercises.[30]

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[27] Sorelle, "Crisis pushes California EDs to the breaking point."

[28] Sorelle R. Ratios pit nurses against hospitals, doctors. *Emergency Medicine News.* April 2001, Vol. 23, No. 3, pp. 1,26,29.

[29] L.A. Johnson, T. B. Taylor, R. Lev, "The emergency department on-call back-up crisis: finding remedies for a serious public health problem," *Annals of Emergency Medicine*, No. 37, May 2001, pp. 495-499.

[30] DCHA Hospital Mutual Aid System, "November 15 [1999] Hospital Tornado Drill Outline (with Hospital Participation)" (Washington, D.C.: District of Columbia Hospital Association, November 11, 1999).

The net result of these factors is that hospitals are currently structured with a very limited surge capacity, even for normal fluctuations in patient volume.[31] Indeed, many regions of the country are regularly experiencing severe shortages of beds for normal acute care.[32] Hospital emergency departments are now commonly filled to capacity during daily operations and must divert even critically ill emergency cases.[33] A telling sign of this crisis is a formal position statement released by the Arizona College of Emergency Physicians (AzCEP). In December 2000, they declared that AzCEP "hereby goes on record as stating that the emergency physician community has lost confidence in the emergency healthcare infrastructure in Arizona and that current resources supporting emergency care are inadequate to meet the needs of all patients at all times."[34]

FINANCIAL CHALLENGES TO ADEQUATE PREPAREDNESS

Adequate preparedness for mass casualties requires an objective assessment of risks, analysis of needs, and development of systems. A component of risk assessment is a vulnerability analysis, which determines the impact of a hazardous event. An adequate healthcare response capability is specifically designed to meet the projected needs determined by this vulnerability analysis. In contrast, the concept of reasonable preparedness is defined as response capabilities established within the limits of available resources, including funding.

When analyzing the mass casualty needs of an incident involving deliberate release of chemical, biological, or radiation agents,[35] a clear disparity is evident between "reasonable" versus "adequate" healthcare response capabilities.[36] Among these vulnerabilities are the following:

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[31] D. Ensor, "Experts: U.S. medicine unprepared for biological terrorism, <CNN.com./U.S.> May 10, 2001, accessed May 10, 2001, at <www.cnn.com/2001/US/05/10/terror.attack/index.htm>; J. Babula, "Crowded hospitals, paramedics caught in ER crisis: ambulance provider may start leaving patients unattended," *Las Vegas Review-Journal*, October 12, 2000, reprinted in *Emergency Physicians Monthly*, Vol. 7, No. 12 (December 2000) pp. 7, 13; A. Goldstein, "D.C. General refuses ambulances: nurses shortage behind decision to redirect trauma patients," *The Washington Post*, April 21, 2001, pp. B1, B4.

[32] R.W. Derlet, J.R. Richards, "Overcrowding in the nation's emergency departments: complex causes and disturbing effects," *Annals of Emergency Medicine*, No. 35, January 20, 2000, pp. 63-68.

[33] A. Trafford, "America's ERs: in critical condition," *The Washington Post*, May 1, 2001, p. HE03, accessed May 1, 2001, at <washingtonpost.com/wp-dyn/health/A22680-2001Apr30.html>.

[34] Arizona College of Emergency Physicians, "Position statement on the critical state of emergency care in Arizona," accessed April 30, 2001, at <www.azcep.org/er_crowding/position.pdf >.

[35] Macintyre AG, Christopher GW, Eitzen E et al. "Weapons of mass destruction events with contaminated casualties: effective planning for health care facilities," *Journal of the American Medical Association*, 2000, Vol.

- patients present a potential threat to health care workers and the facility itself unless appropriately managed;

- patient conditions require unusual and expensive capabilities for adequate management, such as decontamination systems, isolation wards, ventilation requirements, and special medications; and

- hospitals could themselves be primary or secondary targets, markedly increasing security requirements.

Adequate preparedness for terrorism is therefore expensive and time-consuming. Federal terrorism preparedness programs established and funded to improve the capabilities of first responders and the National Guard demonstrate this expense. Recent federal funding initiatives have provided millions of dollars to support WMD training and equipment for the public safety and first-responder community.[37] In fiscal year 1999 alone, $43.8 million was provided to local emergency responders (primarily firefighters and police) for equipment purchases.[38] This financial support is regularly credited with aiding the development of local first-responder capability.[39] However, no comparable appropriations for hospital preparedness have been made, even though building and maintaining adequate excess and specialized healthcare capacity is more expensive and just as crucial in developing first-responder capability.

283, pp. 242-249; Biological Weapons Improved Response Program, "Improving local and state agency response to terrorist incidents involving biological weapons: interim planning guide," August 1, 2000 Final Draft, U.S. Army Soldier and Biological Chemical Command. Aberdeen Proving Ground, MD; Radiation Emergency Assistance Center/Training Site. Managing Radiation Emergencies: Guidance for Hospital Medical Care Management. Accessed June 18, 2001 at <http://www.orau.gov/reacts/emergency.htm>

[36] A.G. Macintyre, G.W. Christopher, E. Eitzen, et al., "Weapons of mass destruction events with contaminated casualties: effective planning for health care facilities," *Journal of the American Medical Association*, No. 283 (2000), pp. 242–249; Biological Weapons Improved Response Program, "Improving local and state agency response to terrorist incidents involving biological weapons: interim planning guide," August 1, 2000, Final Draft, U.S. Army Soldier and Biological Chemical Command, Aberdeen Proving Ground, Maryland; Radiation Emergency Assistance Center/Training Site, "Managing Radiation Emergencies: Guidance for Hospital Medical Care Management," accessed June 18, 2001, at <www.orau.gov/reacts/emergency.htm>.

[37] U.S. Department of Justice (DOJ), Office for State and Local Domestic Preparedness Support (OSLDPS), Training Page, accessed April 30, 2001, at <www.ojp.usdoj.gov/osldps/training.htm>.

[38] U.S. DOJ, Office of Justice Programs (OJP), Funding Opportunities at OJP, accessed April 30, 2001, at <www.ojp.usdoj.gov/fundopps.htm>.

[39] J. Newton, "Bioterrorism drills: county specialized response team prepares for chemical attack," *The News Sun* (Lake County, IL), April 28, 2001, accessed May 1, 2001, at <www.copleynewspapers.com/NewsSun/>.

Given current financial incentive structures, emergency preparedness might actually be imprudent financial practice for healthcare institutions. Developing "surge capacity" has little to do with normal hospital operations, and provides no significant income. While the likelihood of a major terrorism incident somewhere in the United States is necessarily higher than it is in any one region or locality, only a low probability exists that any particular hospital's surge capacity would be utilized during the useful life of the equipment and training cycles. Even if an event requiring surge capacity occurs, chaotic circumstances and restrictive registration requirements might keep hospitals from assembling the documentation necessary to get full compensation for services rendered. These factors raise legitimate business and financial questions for hospital administrators and trustees in their decisions to participate in community emergency preparedness. A program to develop needed capabilities must address these financial realities.

DEVELOPING HOSPITAL SURGE CAPACITY IN THE FACE OF ECONOMIC RESTRICTIONS

Adequate preparedness requires sustained, directed funding sources with controls that promote true hospital preparedness for a defined surge capacity. Public policy must recognize that hospital preparedness for mass and/or specialty casualty scenarios is a public safety function, similar to fire suppression services, emergency medical services, and police services. It is economically unjust to expect the cost of this preparedness to be borne by a private-sector business, or by public medicine facilities struggling to meet their current healthcare mandates. Adding more unfunded mandates to increase preparedness participation by the healthcare community is unlikely to improve capacity. Adequate hospital and healthcare preparedness for large and/or specialty casualty loads will only be accomplished when public policy accepts this public safety premise and begins to address the legitimate responsibility for the costs of developing and maintaining preparedness capabilities. It is equally important that reasonable hospital preparedness guidelines accompany these funding streams, with a built-in accountability system for reasonable and adequate preparedness efforts by hospitals.

To accomplish this, financial responsibility for the actual costs of preparedness should be assigned either to the public as a whole, or to the activities and organizations associated with increased risk of mass/specialty casualties. Either approach would be an improvement over the current practice of arbitrarily expecting the costs to be assumed by the local healthcare community.

Among the sources of increased risk of mass or specialty casualties are industries that maintain or transport dangerous hazardous materials, such as manufacturers, rail companies, and power generating facilities. Another category of risk is represented by organizations that present an attractive target for terrorists by bringing together large numbers of individuals into one location. Examples include sporting and performing arts arenas, mass transit operations, parks with mass gatherings, and sites used for political demonstrations. A third category comprises organizations whose activities have historically generated a higher than average risk for mass casualties, including airlines, certain government agency installations such as Internal Revenue Service offices, and other organizations historically targeted by terrorists such as abortion clinics.

It is operationally impossible to expect hospitals to fund the costs of adequately preparing for the risks generated by others. This key deficiency must be addressed by analytically establishing the cost of preparedness (development and maintenance) and then proportionately assigning responsibility for the costs.

Public policy precedent exists for funding similarly critical contingency systems that address risk generated by industry, and for basing this funding upon an assignment of risk. The following alternatives suggest useful models for funding adequate surge capacity for mass or specialty casualties.

General Tax Revenue Model

In a general tax revenue model, the risk is assigned to society in general. This approach recognizes that the risk of mass casualties is created by such a broad base that general tax revenues should be used to address the costs of preparedness. Most communities currently fund their other essential public safety initiatives (fire, police, emergency medical services, and emergency management) through general tax revenues, including the communities' capabilities for mass casualty incidents. The same level of emergency health care preparedness should be acknowledged as critical to the overall response system, on par with the other response disciplines. Public money would then be contractually obligated to healthcare resources, allowing development and maintenance of a well-defined patient surge capacity.

Public funding of these generally private reserve capabilities has a well-established precedent: the Civilian Reserve Air Fleet (CRAF) program provides federal funding to private sector airlines to maintain capacity for rapidly converting commercial passenger jets into patient evacuation aircraft for a major disaster or national security incident.[40] Over $700 million in federal funds was spent on this capability in 1999. A program modeled after CRAF could provide a reserve surge capacity for both public and private medical capabilities to respond to a mass casualty incident.

HazMat Assessment or Specialty Tax Model

In a HazMat Assessment Model, risk would be assigned to appropriate segments of society that are tasked with the responsibility to fund public safety preparedness. Here, too, there is precedent for requiring payment as compensation for generating community risk: many communities require a license fee for plant operators and transportation companies who deal with defined levels of hazardous materials. The license fee is considered a cost of doing business. In many locales, a portion of the license fee is used to fund the community hazardous-materials response team.[41] Such fees, however, have rarely been used to assist the community's hospitals in preparing for the reception of chemically contaminated casualties from the licensed facilities.

Public policy could mandate that the HazMat license model be extended to include directed funding to aid hospitals in preparing to manage chemically contaminated mass casualties. The concept of licensing fees could be further extended beyond HazMat to encompass other activities and organizations that generate risk for mass casualties. Such fees could be included in entertainment licenses and mass gathering permits, as well as other special functions. Under this model, hospitals (like HazMat teams) would be required by government agencies to commit to, and meet, a defined preparedness standard to be eligible for initial and continued funding. They thus would be "licensed" as well as funded to perform the designated duties.

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[40] Civil Reserve Air Fleet Fact Sheet, accessed April 13, 2001, at <www.af.mil/news/factsheets/Civil_Reserve_Air_Fleet.html>.

[41] Channel 4 Staff, "Anderson HazMat worried about preparedness: team has received anti-terrorism grant," February 11, 2001, accessed February 14, 2001, at <www.thecarolinachannel.com/gs/news/andersonnewsroom/stories/andersonnewsroom-45570420010211-110254.html>.

The "worst-case scenario response plan" or "MSRC" model

The "worst-case scenario response plan" model would assign risk to specific facilities that are tasked with the responsibility to develop adequate preparedness. The model for this approach is the Marine Spill Response Corporation (MSRC), which was created to meet the requirements of federal legislation passed after the Exxon Valdez ecological disaster.[42] The MSRC is a quasi-public corporation developed to respond rapidly to major coastal HazMat spills.[43] The funding for the corporation is based on the requirement that all companies involved in marine transportation of large quantities of hazardous materials must have a "worst discharge scenario" response plan in place. In order for a corporation to list MSRC as a spill response asset for its plan, the corporation must pay an annual fee that funds MSRC which, in turn, is expected to maintain a capacity to address these worst-case spill scenarios.

Similar legislation could require all organizations with a pre-determined level of risk for mass or specialty casualties to develop a worst-case response plan. In order to list the hospital and community healthcare organizations as resources to care for victims of their worst-case scenario, organizations would be required to pay a fee to the government that would go toward improved hospital preparedness for such incidents. As in the HazMat assessment model described above, hospitals would be required by government agencies to commit to and meet a defined preparedness standard to be eligible for initial and continued funding.

Responder "Certification of Preparedness Requirement" Model

In a Responder "Certification of Preparedness Requirement" model, risk would be assigned to specific facilities and their response resources. This model is similar to the MSRC model described above, with the financial obligations assigned to the organizations generating the mass/specialty casualty risk. The difference is that the organization that utilizes the healthcare resources as part of its response plan must obtain certification directly from the healthcare facility that the latter has adequate capacity to perform the functions expected of it during a worst-case scenario response. The facilities that generate the risk would fund the development and maintenance of this certified healthcare capability.

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[42] Oil Pollution Act of 1990 (OPA-90), P.L. 101-380, enacted August 18, 1990; Marine Spill Response Corporation web site, accessed April 12, 2001, at <www.msrc.org/>.

[43] Marine Spill Response Corporation website, accessed April 12, 2001, at <www.msrc.org/>.

Such a direct relationship might be the best way to maintain accountability by the healthcare system to the at-risk community for its response capability. The hospitals would be directly responsible to the payers, removing burdensome regulatory oversight. The role of government agencies would be limited to assuring that all parties maintain good-faith practices in their planning, funding, and implementation of response capabilities.

Using these or other concepts, public policy debate at the local, state, and national level must establish a single or combination of remedies to resolve this critical healthcare funding issue.

CONCLUSIONS

The United States is currently developing public policy, law enforcement, and emergency response capacity to address the rising concern for mass terrorism. Glaringly absent from current practice is any clear, consistent approach to funding preparedness for the healthcare system to manage the inevitable mass or specialty casualties. Current economic factors have adversely affected the capability of hospitals to fund preparedness, and adequate preparedness will never be accomplished without public policy recognition that this is a crucial public safety function.

Funding methods must be identified and implemented through public policy declarations, legislation, and regulations. This effort could begin initially with legislation to require community funding of hospitals that prepare to receive a community's chemical casualties, perhaps by amending SARA Title III, since this is already in place and is currently an unfunded mandate for hospitals. This could then be extended to include funding for healthcare facilities preparing to receive casualties from other unusual events. The models above, singly or in combination, could be used to develop sustained funding. It is equally important that, once a system of funding is established, hospitals are held accountable for establishing and maintaining the funded mass-casualty capabilities.

The Exxon Valdez ecological disaster provides a sobering lesson. The United States did not develop adequate infrastructure for disastrous oil spills until after the Exxon Valdez incident. The United States cannot, however, afford to wait until it suffers an even greater mass casualty terrorism event than the September 11, 2001, attacks before addressing critical shortfalls in hospital surge capacity. Without conscious advanced preparation, the nation may awaken to find that an extraordinary event has exceeded our capacity to save lives and health: that our limited response capacity has created the unforgivable dilemma of "ambulances to nowhere."

EXECUTIVE SESSION ON DOMESTIC PREPAREDNESS

JOHN F. KENNEDY SCHOOL OF GOVERNMENT
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The John F. Kennedy School of Government and the U.S. Department of Justice have created the Executive Session on Domestic Preparedness to focus on understanding and improving U.S. preparedness for domestic terrorism. The Executive Session is a joint project of the Kennedy School's Belfer Center for Science and International Affairs and Taubman Center for State and Local Government.

The Executive Session convenes a multi-disciplinary task force of leading practitioners from state and local agencies, senior officials from federal agencies, and academic specialists from Harvard University. The members bring to the Executive Session extensive policy expertise and operational experience in a wide range of fields - emergency management, law enforcement, national security, law, fire protection, the National Guard, public health, emergency medicine, and elected office - that play important roles in an effective domestic preparedness program. The project combines faculty research, analysis of current policy issues, field investigations, and case studies of past terrorist incidents and analogous emergency situations. The Executive Session is expected to meet six times over its three-year term.

Through its research, publications, and the professional activities of its members, the Executive Session intends to become a major resource for federal, state, and local government officials, congressional committees, and others interested in preparation for a coordinated response to acts of domestic terrorism.

***For more information on the Executive Session on Domestic Preparedness, please contact*:**

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BCSIA is a vibrant and productive research community at Harvard's John F. Kennedy School of Government. Emphasizing the role of science and technology in the analysis of international affairs and in the shaping of foreign policy, it is the axis of work on international relations at Harvard University's John F. Kennedy School of Government. BCSIA has three fundamental issues: to anticipate emerging international problems, to identify practical solutions, and to galvanize policy-makers into action. These goals animate the work of all the Center's major programs.

The Center's Director is Graham Allison, former Dean of the Kennedy School. Stephen Nicoloro is Director of Finance and Operations.

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