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US $75 Annual

Volume II, Issue 5, March 8, 2006

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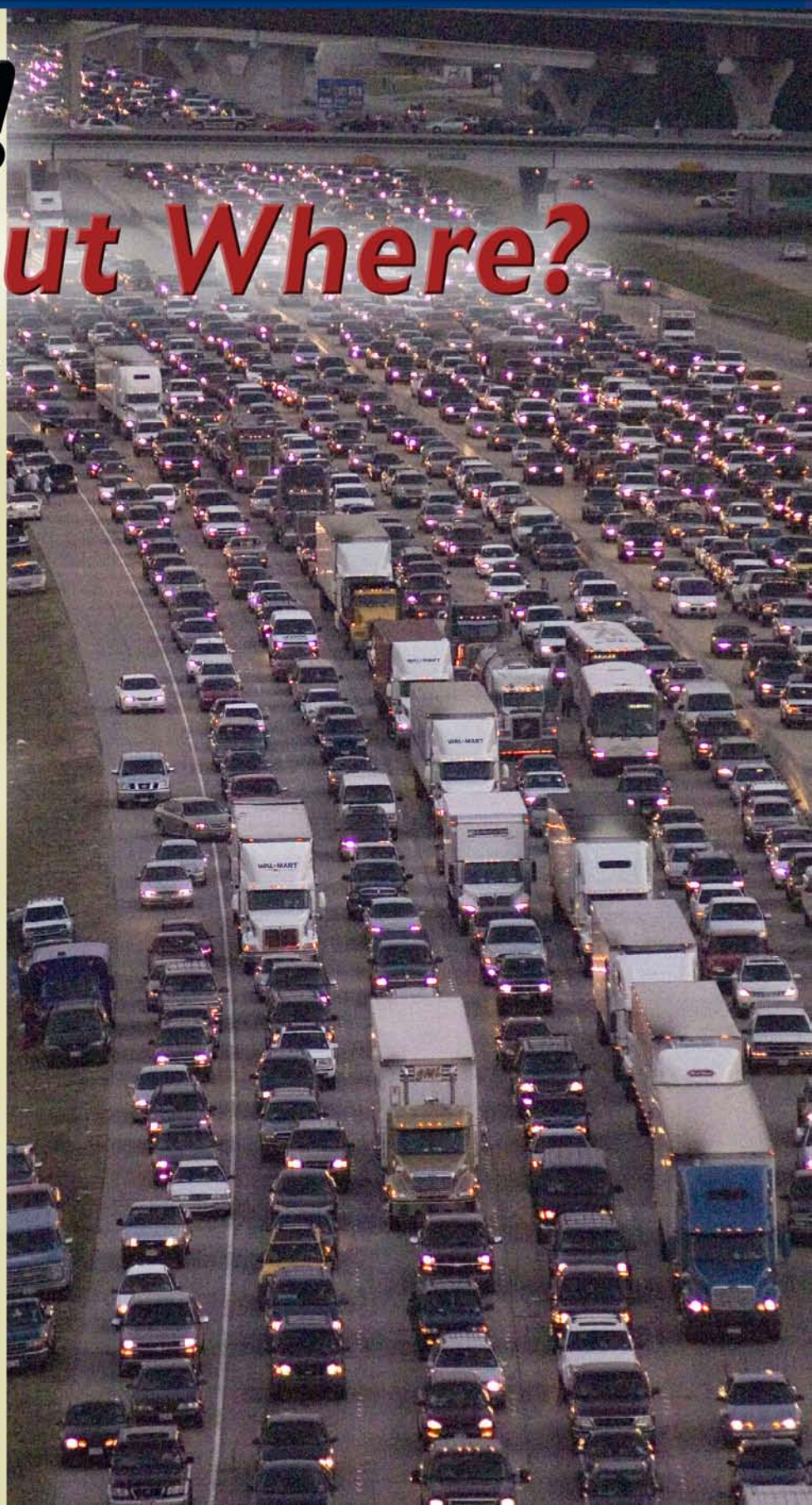

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DomPrep Journal is electronically delivered 26 times per year by the IMR Group, Inc., 517 Benfield Road, Suite 303, Severna Park, MD 21146, USA; 410-518-6900; fax 410-518-6020 and available at DomPrep.com

Articles are written by professional practitioners in homeland security, preparedness, and other related fields. Manuscripts are original work, previously unpublished and not simultaneously submitted to another publisher. Text is the opinion of the author; publisher holds no liability for its use or interpretation.

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Editor's Notes

By James D. Hessman, Editor-in-Chief

The early availability of effective and comprehensive medical care becomes a matter of life-or-death importance at some time or another to almost all Americans. Fortunately for the citizens of this country, the U.S. medical system is by almost any standard of measurement the best in the world. There are more doctors and nurses and other highly trained medical professionals per capita than in any other country of comparable size. More hospital beds as well, more and better operating rooms, emergency rooms, ambulances, diagnostic systems, and a bewildering assortment of other medical devices, equipment, and high-tech systems of all types.

The nation's great universities and major health care centers provide assurance in abundance that the quality of U.S. medicine will not decline at any time in the foreseeable future but will, in fact, continue to improve. And America's private-sector pharmaceutical companies will continue to improve the quality and effectiveness of the medicines they create and manufacture for the treatment of almost any disease or ailment known to man.

All of which is not to say that the American medical system – an umbrella term that encompasses thousands of local, state, and federal health care agencies as well as tens of thousands of private-sector hospitals, clinics, laboratories, ambulance companies, and doctors' offices – is not without problems. Far from it.

Medicare and Medicaid have made quality medical care available to literally millions of citizens who would not have been able to pay for that care on their own. But the laws that created those programs, and the rules and regulations by which they are implemented, are complex, confusing, and frequently contradictory. The point to remember, though, is that most if not quite all of the Medicare/Medicaid and other problems that have resulted are management and administrative problems – and, therefore, political problems as well – but not medical problems per se.

There is, though, one major, overarching, management problem with U.S. medicine that, unless it is speedily addressed, could profoundly and adversely affect all Americans – namely that, as it now exists, the U.S. medical system is in no way prepared to deal with a truly major disaster, of tsunami magnitude, that could suddenly endanger the lives of many thousands of citizens all at the same time.

A tsunami itself is unlikely, as are massive floods or earthquakes that might devastate entire regions of the country. But new terrorist attacks involving dirty bombs or biological or chemical weapons are not only possible but, according to many counterterrorism experts, increasingly likely. If and when such an attack – or several attacks, either simultaneously or sequentially – takes place will there be enough ambulances available, enough hospitals, enough doctors and nurses, and enough medicines? The short and truthful answer is that there will not be enough of *anything* available.

Read this issue of *DPJ* to learn some of the reasons why, and to find out how at least some of the potentially fatal ailments now afflicting the U.S. medical system might be, if not completely cured, at least ameliorated to some extent.

Cover Photo: The massive traffic jam during the evacuation of Houston prior to Hurricane Rita is typical of what could happen anywhere else in the nation during future times of disaster. The article by Joseph Cahill beginning on pg. 8 discusses even greater problems that might occur without more and better advance planning. (Photo by Jim Olive reprinted with permission of Stockyard Photo.)

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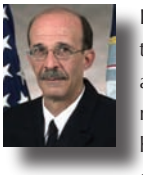
Isolation & Quarantine: How, When, and How Much

By Jerry Mothershead, Military Medicine



Isolation and quarantine are topics of much recent debate among U.S. policymakers, emergency managers, and both public-health and medical-system officials. The recent State and Federal Public Health Preparedness Summit (22-24 February in Washington, D.C.) included several sessions dedicated to exploring these issues. The Summit was a follow-on to the January 2006 release of *Issues to Consider: Isolation & Quarantine*, a checklist developed by the National Association for City and County Health Officials.

Although both isolation and quarantine are important public-health working tools, emergency managers and other public officials involving in mitigating a public-health disaster must have a firm working knowledge of the risks, benefits, and challenges in using either of these tools.

First, some basic definitions:

- Isolation is a medical procedure, applied to an individual, a group of individuals, or potentially an entire population, who have a *communicable* (read "contagious") disease, whereby the affected individual is separated from those not so affected for the duration of the time that the disease in question is communicable. It traditionally is applied in a hospital setting, but could be instituted in one's home. Inherent in this definition are the following: Isolation is not applied to asymptomatic individuals; the isolated individual must be infected with a live, biological pathogen; and the person infected must be capable of transmitting the pathogen to others. Theoretically, all infectious diseases are communicable, but the ones of greatest concern are those transmitted through the air.

- Quarantine is the restriction, through voluntary or compulsory methods, of individuals who are *without symptoms* but are presumed to be infected with a biological pathogen capable of producing a communicable disease. The quarantine, a status established by a legally empowered authority, continues until those under quarantine no longer pose a transmission risk

- "Shielding" – i.e., social distancing – includes those non-pharmacological actions taken to reduce an individual's risk of exposure to a communicable disease or to reduce the probability of exposing someone else to the disease.

Black Plague, SARS, & U.S. Code

Isolation is a relatively new construct that has evolved in step with man's knowledge of how diseases are transmitted. Quarantine has been around since at least Biblical times, and has sometimes been imposed incorrectly. During the Black Plague, a *cordon sanitaire* was instituted around some cities – reflecting the belief that transmission could occur only through infected humans – to keep those infected with the plague from coming in contact with other people.

Quarantine has been used in the United States since colonial days, when it was imposed by city or colonial governments – primarily on arriving maritime traffic. Quarantine authorities are divided among federal, state, county, and local officials. In general, state and local public-health officials are responsible for quarantine issues within their states.

Under a declared State of Emergency, though, governors have extraordinary powers to impose certain restrictions to protect the public.

Most recent uses of quarantine and isolation laws have targeted relatively small numbers of individuals, however. But experience in large-scale quarantine is rather skimpy, and many experts in this field have deemed state laws inadequate for dealing with large-scale public-health emergencies. For that and other reasons, many states have revised, or are in the processing of revising, their public-health laws, including those related to isolation and quarantine.

In doing so, some states have used the guidelines spelled out in the Model State Emergency Health Powers Act, which was developed in 2001 for the Centers for Disease Control and Prevention (CDC). Title 42 of the U.S. Code authorizes the U.S. Surgeon General to take any action needed,

including the imposition of isolation and/or quarantine, to prevent the introduction from overseas, or through interstate spread, of certain communicable diseases (which must be identified as such by Executive Order). In 2003, Executive Orders added several diseases, including Severe Acute Respiratory Syndrome (SARS), to the list. Proposed (and sometimes controversial) revisions to 42 USC that will expand federal quarantine powers and empower certain non-governmental authorities already have been posted in the Federal Register.

States may assist the federal government, and vice versa, in implementing and enforcing isolation and quarantine. The use of this valuable containment tool in situations affecting a large number of people will therefore require both vertical coordination among several levels of government and horizontal collaboration across the nation's public-health, public-safety, governmental-affairs, and law-enforcement communities.

Inequality Among Bugs

There are several fundamental issues that have yet to be addressed, however, and some important questions that have not yet been answered. Following are a few of the most important of those questions:

1. Can quarantine and isolation work? Here the not totally satisfactory answer is "It depends." Not all bugs are created equal. Each has specific characteristics that will influence the effectiveness of quarantine efforts. Smallpox and influenza victims, for example, may transmit those diseases at the end of the disease incubation periods, but before the victims indicate signs of suffering from a major illness. In that situation, secondary victims will likely not even know they have been exposed prior to themselves becoming ill, thus allowing sufficient time for further spread. In only one of the 20th-century influenza pandemics did quarantine have any effect, and that was in merely slowing disease progression.

On the other hand, the overall transmissibility of SARS is relatively low – which was a major factor in the apparent success of the quarantine and travel-advisory measures taken during the 2004-2005 outbreaks. Nonetheless, some level of quarantine may be mandatory to contain an epidemic more rapidly. A CDC analysis focused on the containment of smallpox revealed that, without the institution of at least some limited quarantines, eradication in the United States of that disease might well take more than a year after even a relatively small outbreak.

2. Can an effective quarantine strategy be devised? Again, the answer is "It depends." Quarantine could be instituted on a large scale to exclude a disease from the United States (scenario 1). It also could be instituted to halt the interstate or inter-regional spread *within* the United States (scenario 2). Considering the much discussed leakiness of the U.S. borders with Canada and Mexico, scenario 1 seems impossible.

However, whole-nation quarantines were imposed in Australia, Madagascar, and elsewhere during the 1918-1919 Spanish Influenza Pandemic. Vigorous controlled quarantines on island nations appeared to be very effective, but in Australia only slowed, but did not stop, the spread of the disease. It should be remembered that the quarantine measures then instituted were well before widespread (and rapid) travel became the global norm. During the SARS epidemics, passenger screening was instituted in many locations, but because of the minimal size of the outbreaks it is difficult to ascertain the effectiveness of the measures taken. Proposed changes to 42 USC Sections 70 and 71 would empower the airline industry to "make the call" against individuals suspected of harboring a quarantinable disease. Many experts question the ability to train lay industry personnel to adequately make such decisions.

Scenario 2 harkens images from the movie thriller "Outbreak," but no one can doubt the extreme economic, emotional, and logistical support burdens that would arise from an attempt to quarantine even a small town or village in today's United States. Road closures were attempted in Australia, Canada, and elsewhere during the 1918 pandemic, but were shown to have little effect, and many other countries rejected such measures outright as being unenforceable.

There may, however, be some utility in ordering a quarantine, even knowing it could not or would not be enforced. Slowing the progression of a pandemic would allow more time for the development, mass production, and distribution of medicines, and for taking various related medical countermeasures. Moreover, quarantines can be graduated, ranging from imposition on high-risk segments of society through the most draconian entire-population quarantine.

In any event, quarantine advisories are likely to be effective only to the degree that the public trusts the government. Targeted population quarantines may include the cancellation of mass-gathering events, or mass-transportation restrictions (imposed, for example, on bus, train, and airline travel).

As the more extreme forms of compulsory quarantine (e.g., border closures and/or nighttime curfews) are instituted, compliance will be more difficult to ensure, enforcement will be problematic, and the logistical burden of maintaining critical-infrastructure operations will increase exponentially. One very real option is to develop a *cordon sanitaire* approach to guarding many of these critical infrastructures – city reservoirs and nuclear power plants are among the more obvious examples – with volunteer skeleton crews sequestered at or close to those sites.

3. Are there other quarantine-related actions that may be of value? Here the answer is a clear "Yes." First among these actions should be a pre-outbreak public information and education program. Most citizens would be more inclined to follow instructions if those instructions make sense, are considered to be personally useful, and are presented in a non-alarming fashion by trusted sources. Unfortunately, there is abundant evidence that many citizens will *not* take the common-sense steps they should take before a catastrophe strikes. Hurricanes Katrina and Rita demonstrated the value, to individuals and to families, of personal-emergency action plans. But it cannot safely be assumed that the lessons learned from those catastrophes will be applied by large segments of the population prior to the onslaught of similar disasters in the future.

Preparing for the Super-Catastrophe

However, personal shielding and protective actions still may be of value. Simple common-sense actions such as the frequent washing of hands and, in times of disaster, the avoidance of highly crowded environments would greatly reduce (but not completely eliminate) the transmission of many diseases. The voluntary wearing of masks, although not proven to be totally effective, also may have value, if only to serve as a constant visible reminder to take other precautions.

Private businesses and corporations should review their own continuity plans as a corollary to whatever public actions are being taken. Telecommuting and outsourcing to the home environment should be made easier for as large a number of employees as possible. Even internally, the sequestration of company personnel into smaller cohorts of employees may help reduce the spread of disease – again, not *eliminate*, but reduce.

As part of this process, companies and public institutions should review their plans for "snow days" and consider using the same plans, modified as appropriate, in times of major emergencies. The greatest difference in using such plans to cope with disasters rather than for actual inclement-weather operations would be that the duration of the disaster probably would be significantly longer – and have a much greater impact on operations. That impact, however, could be mitigated to at least some extent through pre-planning.

To summarize: The imposition of quarantine as the primary solution to containing a highly contagious disease would probably not be practical. If history is any guide, it would not work with 100 percent effectiveness, compliance and enforcement would be extremely difficult, and the logistical problems that develop would be nearly impossible to overcome. A targeted quarantine, however – combined with personal shielding and/or other quarantine-like actions – might prove to be as effective in the long run. Nonetheless, quarantine may serve as a valuable adjunctive containment measure to buy time – either to start other mitigation actions, or to maintain business and governmental continuity during a major public-health super-catastrophe.

Evacuation Planning: A Long, Long Way to Go

By Joseph Cahill, EMS

In the years and months after the 11 September attacks, a great deal of work has been done at the federal level both to improve overall domestic preparedness and to standardize the response methods prescribed to deal with major disasters. Homeland Security Presidential Directives (HSPDs) 5 & 8 directed the work through development and issuance of a National Response Plan (NRP) and creation of the National Incident Management System (NIMS). The latter formally specifies use of the Incident Command System (ICS) as the standard approach to managing major disasters and catastrophes. The same directives mandate various training programs that are required.

As a result of the actions taken after 11 September the nation is now better prepared to handle a disaster than it was on that day. Some might look at the difficulties encountered during Hurricanes Katrina and Rita and disagree with that assessment. However, as with so many other issues in the real world of emergency management, the truth is more complicated than it might seem from reading the papers or watching the evening news on television.

> On 11 September 2001 long lines of ambulances swarmed into lower Manhattan. Many of them were from emergency fleets; others came from non-emergency providers. They came from nearby cities and states, and from as far away as Canada. What they shared was a willingness to help in that national moment of tragedy.
>
> What they did ***not*** share was common training.

Forced Evacuations Sometimes Required

One of the most important issues related to the consequence-management problems that were so obvious in the wake of the two hurricanes was the inability – of almost all of the state, local, and federal agencies involved – to quickly and fully evacuate more of the people immediately affected. Of even greater concern was the inability to evacuate the patients in care facilities such as hospitals and nursing homes.

Many states – Louisiana and Texas among them – require nursing homes to have formulated, and to be ready to execute, an emergency plan that includes forced evacuation. Unfortunately, there are often no individuals or government agencies available and/or specifically responsible for reviewing those plans, and there is seldom if ever a realistic program in place to carry out training drills and exercises.

Further, and possibly of even greater importance, there usually is no central authority designated to ensure that the same personnel and material resources that would be required for an effective evacuation are not listed in several different plans. Nor, in most jurisdictions, is there any individual or agency designated to take requests for and control the allocation of resources during an emergency. Moreover, when and where an individual or agency has been designated, the process for requesting resources is not widely known outside of the emergency-management community. The end result, of course, is that evacuations such as the transfer of patients from nursing homes in some areas in Texas – carried out in anticipation of Hurricane Rita – were often carried out by ad-hoc "get it done" methods and resources.

Too Much and Too Soon

What frequently happens is that well-intentioned bus or ambulance companies enter into agreements with state and local governments to provide evacuation services for nursing homes. Unfortunately, the companies involved often agree to provide the same services to many facilities, a practice that might be acceptable in situations affecting only one or a few facilities. In mass disasters affecting an entire state or a major region within the state – and, therefore, a large number of facilities all at the same time – the result is an impossible situation in which a single resource is being relied on for multiple evacuations to be carried out simultaneously.

The natural inclination would be to criticize the bus and ambulance companies involved. It should be remembered, though, that most evacuation planning anticipates and is based on facility-specific events such as a fire, a flood, or the loss of heat – with other facilities in the same general area remaining unaffected. It is in responding to regional events and incidents, in which the general evacuation of a large area within a state is required, that these arrangements become problematic. The need for much greater coordination of both tasks and resources is the key to resolving this problem, but to be effective that coordination has to start during the planning phase.

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In planning for evacuations, it is essential that every resource reasonably available that might be used is considered. The place to start is with: (a) the resource providers – i.e., the bus and ambulance companies working in a specific geographic area; and (b) the hospitals, nursing homes, and other facilities in the same area that might need the resources. Estimates of the resources needed to evacuate a specific facility must be created, and these estimates should be based on the number of beds in the facility, rather than on the current patient population. The transportation resources likely to be available also must be estimated, keeping in mind the probability that some will be out of service due to lack of staffing and/or vehicle breakdowns.

The same factors apply when staffing is considered. Often, the same person who is a member of the local volunteer ambulance corps may by working as a nurse in the local emergency room and/or is a member of the regional Disaster Medical Assistance Team (DMAT) as well. That one person might well be counted three times, therefore, when staffing estimates are developed.

The first and most obvious solution is to centralize at least some of the resource management required to cope with major incidents. It is impossible to achieve effective resource management of a large regional event when each facility in the region is free to negotiate separately with the resource providers available. Here the rule of thumb should be that, when the magnitude of an event is greater than can be managed at the local level, the responsibility for coordination must be assigned to a higher level. This is probably the only way that coordination not only can be effective but also can prevent a competition for resources.

An Ethical And Legitimate Contract

All of which is not to suggest that the management of the facilities affected should be absolved of planning responsibilities. However, the planning efforts of the facility should be focused on facility-specific events and those that are likely to be only local in scope. A fire at the facility that requires moving the clients to a sister facility, for example, would be well within the scope of the facility's plan. It also is likely to be the highest magnitude of event for which the contracted resource provider might legitimately, and ethically, contract with a number of different facilities without running into the need to prioritize limited resources in an ad hoc manner.

One of the keys to responding to major disasters is thinking outside the box in terms of resource planning. The example of a nursing home evacuation in the context of a general evacuation of the surrounding region, including other nursing homes and similar facilities, could be used to illustrate this point.

In an evacuation such as that postulated, ambulances would be needed to evacuate the sickest and the most fragile patients, because ambulances have both the equipment needed to transport patients on stretchers and the trained personnel and equipment also required to provide care during the transportation phase of an evacuation.

Here it should be noted that, although differences in the level of care provided by the crew of an ambulance are a common way of typing ambulances, for this discussion the distinction between emergency and non-emergency ambulances is a more important consideration. This division is based on whether or not the ambulance is used to answer emergency 9-1-1 calls. Many ambulances are available only for answering emergency calls; others never respond to emergency calls but are used instead to transfer patients between care facilities and/or from medical facilities to the patients' homes.

In many states, an emergency ambulance is given that designation in terms of the staffing, training, and equipment requirements mandated. What separates the two types of ambulances is usually the comparative experience of the crew members. In many respects the crews of the non-emergency transport ambulances have a broader base of experience to operate in an evacuation. This is because their stock in trade is transporting a very sick patient what is sometimes a long distance. Where they are often at a disadvantage is in terms of their specific ICS-related experience.

A Temporary Solution, But No Clear Mandate

There are other transportation resources that routinely carry people to and fro who do not need care en route – wheelchair vans, for example, or Para transits, as they are called in many states, or ambulettes. In New York State, these vehicles are regulated by the Department of Motor Vehicles and are considered a specialized type of bus rather than an extension of medical care. For disaster-planning purposes, though, they must be considered to be vehicles that are capable of transporting a wheelchair but not a stretcher, and that provide no medical care during transport. Among the other general (but non-medical) transportation resources available in times of disaster would be mass-transit buses and vans.

All of these non-medical transportation resources share certain similarities, but they do not normally respond to an emergency, and their "staffs" – the individual drivers, in most cases – are trained to carry out only the tasks they are normally assigned. What is lacking, in most cases, is an organized plan to train them for operations under a management structure that would be responsible for evacuations during a disaster.

ICS is building what is essentially a temporary management structure that can be used in responding to a specific incident. For even that temporary structure to work, though, all of the players involved must be working from the same plan. Non-emergency ambulance staff, para-transit and/or bus drivers, and their management personnel and dispatchers, all must be aware, therefore, of their respective roles within the ICS structure, and should be thoroughly familiar with the plans they may be involved in.

It will do no good for any agency to be assigned regional centralized resource-management authority if the human components of those resources do not understand the plan. This need for understanding extends throughout the community. The good news is that the training resources needed are largely in place. What is still lacking are clear mandates from local, state, and federal decision makers.

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The Role of Medical Systems in Homeland Defense

By Michael Allswede, Hospital Administration

"Oh, all roads lead to the hospital. We're born here, we get sick here, we get well here. All these big dramatic moments and the hospital just gobbles 'em up."

Niles Crane of "Frazier"

Medical systems are a vitally important but oft-neglected component of the nation's homeland-defense strategy. The Incident Command System (ICS), which provides the guidelines used to respond to catastrophic events, blends the capabilities of different local services and numerous local jurisdictions into an integrated team. The ICS scales upward toward the National Incident Management System (NIMS), which integrates multiple state and federal agencies to coordinate the overall national response to major disasters and other incidents of national significance.

Public health has received large federal grants to rebuild needed infrastructure, but what has been largely left undone is a serious analysis of the role of medical systems. No matter what the disaster, all roads eventually lead to a hospital or other medical facility for the victims. In the case of the clandestine release of an illness-producing chemical, radiological, or biological weapon, the nation will depend upon medical systems not only to treat victims, but also both to detect and characterize the threat.

There are a number of reasons why medical systems are not included as full and equal partners in the national-preparedness architecture. First, most U.S. medical systems are not government agencies, but are independent private businesses. These businesses compete with one another in the health care market and are not always predisposed to cooperate with one another. In addition, each medical system represents a unique organization ranging from single-proprietor clinics to major university medical centers.

Moreover, there is no overarching national organization of medical systems that is specifically responsible for homeland preparedness. In addition – and unlike police or fire departments, many if not all of which are designed to have extra capacity available if needed – medical systems are designed for maximum efficiency. Finally, because most cash inflows to medical systems consist of reimbursement for medical care – and very little if any for preparedness planning – any training drills or exercises, equipment, or personnel costs related to disaster training must be paid for from the medical system's own capital or operating funds.

Speed Is of the Essence

The net result of these market forces is that the U.S. medical system is both fractured and underfunded, and not focused on medical detection, consequence management, and the broad spectrum of other issues involved in dealing quickly and effectively with acts of terrorism and/or natural disasters.

The need for a greater investment in health care is particularly urgent in the detection of a covert or unannounced terrorist event. Detection of the covert release of an illness-producing substance may be clinically determined either by discerning a unique illness (e.g., one caused by anthrax) from normal illness or by discerning an unexpected pattern of illness in the targeted population.

The anthrax events of 2001 provide an instructive example of the costs of diagnostic delays: Those who received the anthrax threat letters, and presumably inhaled the most spores, suffered no mortality, thanks in large part, it seems evident, because of the quick and effective ICS-mandated response. In contrast, those who became the most severely ill from the anthrax letters – and, in fact all of those who died – were among those who had been exposed covertly to contaminated mail and/or mail-handling systems.

America's next experience with bioterrorism may not come with a warning letter. Recognizing the need for early detection of covert events, the U.S. Congress has funded both a BioWatch system for environmental monitoring and a BioSense program for data-mining. While the efficacy of environmental monitoring and data-mining for early detection in civilian society has yet to be proven, it already has been demonstrated that bioterrorism and emerging diseases can be, and have been, reliably diagnosed by clinical medical providers (e.g., anthrax in Boca Raton, West Nile Disease, Hantavirus, and Monkeypox).

The Same Thing, Only Different

While requesting funds for a variety of civic services, the National Institutes of Health, and the National Strategic Stockpile, President Bush's 2006 homeland-security budget proposal does not include language that would improve the actual organization of medical systems for disaster response.

A common misconception is that investing in public health is more or less the same as investing in medical systems per se. That is not the case, though. Although public-health agencies do work hand in hand with hospitals and other medical systems, they are distinctly different organizations. Most public-health agencies are branches of state or local governments, but they usually do not provide medical care to the citizens of the states and communities they represent. Public health functions, rather, as a referral service to evaluate laboratory specimens and disease patterns suspected by clinicians and/or by the general public. For practical purposes, therefore, this means that most public-health officials can deal only with what is reported to them.

Moreover, although every state in the union has enacted mandatory disease-reporting laws, it is estimated that only about 50 percent of the diseases that should be reported actually are reported. The disease-reporting rate seems to depend, in fact, primarily on the prevalent local patterns, with media awareness of the disease also playing a significant role. For example, the reporting rates for AIDS and tuberculosis run between 80 percent and 99 percent, but the rate for meningitis is less than 50 percent.

Disease reporting for less than "newsworthy" diseases is further complicated by individual behaviors and medical practice habits. For

example: For every 100 persons infected with *Shigella*, 76 became symptomatic, 28 consulted a physician, nine physicians ordered stool cultures – seven of which were reported positive (but only six were reported to the local health department) – and only five were reported to the Centers for Disease Control and Prevention (CDC, the national repository for such information).

The First and Primary Victims

It seems clear that, although additional investments in public-health agencies are needed, programs to strengthen the role of medical systems in the homeland-defense architecture might be even more important. Developing a medical system's role in national defense is a vital need because medical systems will be damaged by communicable disease and contaminations. Biological terrorism may involve highly lethal and/or communicable pathogens that are rare, and in some cases, perhaps, totally unknown to the American medical community.

In addition, some delays and preventable infections of health care workers (HCWs) can be expected to occur. As the experience with the SARS (Severe Acute Respiratory Syndrome) outbreaks of several years ago suggest, the rate of infection for HCWs can be well above the national norm. In fact, of the 8,096 probable SARS cases diagnosed throughout the world – according to statistics based on the onset of symptoms between 1 November 2002 and 31 July 2003 – roughly 21 percent (1,706 workers) were identified as HCWs.

More specifically: In Canada, 109 of the 251 cases reported (43 percent) involved health-care workers. In Singapore, the rate was 47 percent (97 of the 238 cases reported). In Toronto, the rate was 51 percent (73 of 144 cases), and in Hong Kong the rate was 62 percent (85 of the 38 secondary and tertiary cases reported).

It should be noted that a SARS infection is not nearly as lethal as a viral hemorrhagic fever or smallpox would be. Should a covert bioterrorist event occur in the United States and recognition delayed, not only would a high mortality rate be likely, but the ability to care for others would quickly diminish if and when, as seems probable, health care workers themselves became victims. The health care system and its personnel are not only the detectors and responders, but they also would be among the first victims of a covert biological attack.

Needed: A Forensic Epidemiology System

As dire as this situation may seem, it is fixable. A helpful first step to improve detection would be to focus on the development of "medical self-awareness." While the majority of clinicians may not have a sustaining interest in terrorism-related material, many do. These clinicians should be recruited, trained, and supported to create a forensic epidemiology system. Forensic epidemiology has been defined as: (a) the use of epidemiologic methods as a part of an ongoing investigation of a health problem for which there is suspicion or evidence regarding possible intentional acts or criminal behavior as factors contributing to the health problem; and/or (b) the use of epidemiologic and other public health methods in conjunction with or as an adjunct to an ongoing criminal investigation.

By sharing with clinical providers known terrorist threats against the nation's health, better initial reporting and analysis could be supported. A forensic epidemiology system may better detect emerging infections, as well as bioterrorist threats, because physician experts would be in the best position to monitor various disease findings and patterns, and to consult with other physicians on their findings. Such a network of clinical experts could also serve as local organizers of response between competing medical systems.

The second important step would be to diminish medical inertia by providing much clearer guidelines for medical-system responses to threat conditions. As terrorist threats to the nation's health wax and wane, medical systems should be advised about those threats, and funded to add extra capacity in terms of staff and equipment. The National Strategic Stockpile addresses equipment support, but without additional medical staff trained and ready to go, the ability to use that asset will be degraded. Like the DEFCON system that guides the U.S. military to adopt different staffing and deployment postures in response to threats, the nation's medical systems should be supported to respond to homeland-security threats without having to divert their own operating revenue.

Finally, it should be recognized that, although most medical care is funded as a commodity, many types of medical care have been legislated as a right. Hospitals must be allowed by crisis guidelines to deviate from their "normal-day" regulations. These guidelines would establish common key strategic and ethical strategies under which health care systems would render care.

In addition, compensation for the care rendered would be paid at rates based on the resources expended, rather than on the documentation of individual patient bills. Reimbursement to medical systems must include assurances that the medical system would be fully compensated for crisis care and, as a corollary, be granted relief from various malpractice and regulatory penalties that might otherwise be imposed.

Dr. Allswede is the Director of the Strategic Medical Intelligence Project on forensic epidemiology. He is the creator of the RaPiD-T Program and of the Pittsburgh Matrix Program for hospital training and preparedness. He has served on a number of expert national and international groups on preparedness.

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Missouri, Tennessee, And California

By Adam McLaughlin, State Homeland News

Missouri Seeks to Strengthen Earthquake Preparedness

An unusual congressional field hearing – held in St. Louis, Mo., in late February – focused on ways to enhance preparedness along the New Madrid Seismic zone. The zone, named after the town of New Madrid in southeast Missouri, extends from northeast Arkansas and runs through southeast Missouri, western Tennessee, and western Kentucky to southern Illinois. Historically, that area has been the epicenter of some of the largest earthquakes ever to hit North America.

The hearing focused on what federal, state, and local officials can do to prepare for a major earthquake that could strike southeast Missouri. "Unlike a hurricane, an earthquake cannot be forecast, and gives no warning," said Rep. Jo Ann Emerson (R-Mo.). Members of the House Subcommittee on Economic Development, Public Buildings, and Emergency Management joined Emerson at the hearing, which highlighted the shortcomings in current response plans.

"Only one bridge between St. Louis and Memphis is … [strong enough] to withstand a magnitude 6.0 earthquake, despite the region being a crossroads of Interstate highways [and a] river, rail, and pipeline transportation [hub]," Emerson pointed out. Most of the communications equipment available to emergency responders could be knocked out if telephone lines or cell phone towers are damaged, the subcommittee was told. In addition, medical equipment and other supplies, and numerous response vehicles, are stored throughout the area in buildings that cannot withstand a major earthquake.

Emerson and Sen. James Talent (R-Mo.), have called for a major preparedness exercise that would include federal, state, and local agencies. "As is the case with military training, planning and preparation exercises help to improve current capabilities – but more importantly, they [also] tell us where we need to focus additional time, effort, and resources," said Talent.

Tennessee HSD-7 Purchases New Emergency Notification System

Tennessee Homeland Security District Seven officials have purchased a powerful new Telephone Emergency Notification System, known as TENS. The system, acquired through State Department of Homeland Security funds, not only calls residents and mobilizes emergency responders, but also can be used to inform the public about ongoing emergencies.

> ***Katrina raised eyebrows about the importance of disaster preparedness***

The HSD-7 officials said that TENS will be used before, during, and after emergency situations, such as terrorist threats or flooding evacuations. The technology used in the system, developed by the Dialogic Communications Corporation (based in Franklin, Tenn.), serves as an Internet calling engine that will allow the district to rapidly alert residents in their homes and to mobilize responding agencies, such as police and fire departments and EMS (emergency medical services) agencies.

Through advanced mapping software, TENS can pinpoint and then automatically contact homes and businesses within specific geographic locations. District officials use digital street-level maps – which cover areas ranging from a single city block to an entire seven-county district – to select the homes and businesses designated for notification. When the system is activated, residents will receive a phone call providing them with safety instructions and other important information – including, for example, the location of emergency shelters and/or the description of a missing child in a specific neighborhood.

California Five Jurisdictions Share Disaster Plans

Officials from five California cities – Danville, Dublin, Livermore, Pleasanton, and San Ramona – in two counties east of San Francisco took a proactive approach toward disaster preparedness by meeting in San Ramon in late February to discuss regional response plans to cope with major incidents affecting the greater Alameda/Contra Costa area. The purpose of the meeting, the officials said, was to provide the framework they needed to return to their home communities and determine how best to implement emergency responses. "What we want to do," said San Ramon City Manager Herb Moniz, "is assure people that there is a plan and that we are prepared."

"I think Hurricane Katrina really raised everyone's eyebrows about the importance of disaster preparedness," Livermore-Pleasanton Fire Chief William Cody said. "It [the meeting] is an opportunity for the communities to come together and really evaluate what is being done in the different cities, and what we can learn from each other."

An area of particular concern for the disaster planners is the heavy traffic on Interstate Highways 580 and 680. Questions arose about the impact on the region if these two major freeways were damaged to the point of causing geographic isolation – by, for example, an earthquake along the Calaveras Fault, the major fault line that runs underneath the San Ramon valley and the junction of the two interstates.

Officials from the U.S. Geological Survey have predicted that there is a 62 percent chance for at least one magnitude 6.7 or greater earthquake along the San Andreas Fault within the next 25 years or so. Rather than wait until the earthquake occurs, attendees at the San Ramon meeting agreed, preparations should start now.

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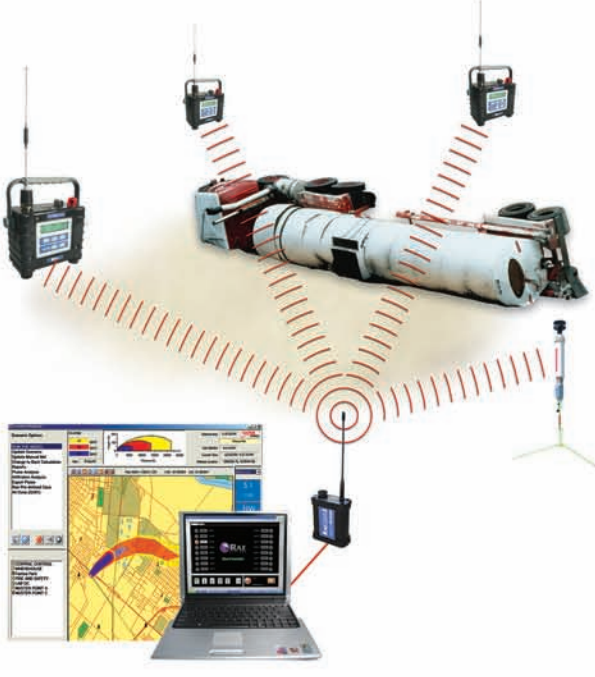

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