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Editor's Notes

By James D. Hessman

The ability to respond to a public health emergency depends on three critical factors: (a) recognition that a new public health emergency does in fact exist; (b) previous training focused on how to respond to such an emergency; and (c) the immediate availability of the human and medical resources needed to cope both quickly and effectively with the emergency – with special focus on saving human lives. This month's printable issue of the *DomPrep Journal* addresses these and other topics from the perspectives of practitioners from several sectors and disciplines.

Charles (Chas) Eby provides the answers to various important and sometimes overlooked questions that volunteers from other disciplines must know to carry out their newly acquired public health duties and responsibilities. Patrick Rose expands on that information with additional particulars – and points out that most major disasters have an adverse effect on public health. All professionals involved must be aware of that grim reality.

On the other hand, as Raphael Barishansky and Audrey Mazurek discuss, there are some public health professionals themselves who – because of family concerns or other imperatives – are sometimes neither willing nor able to report for duty when a disaster occurs. Addressing the concerns of those workers in advance may resolve this sometimes unforeseeable problem, but in certain instances may not. In dealing with disaster victims encumbered by functional needs, James Martin adds, making them fully aware of what they might reasonably expect from responders – and what responders should expect from them – are both important.

To help responders carry out their rapidly escalating duties in the aftermath of a bioterrorism incident, David Reddick outlines the steps required, in the wake of such an incident, for various non-hospital venues to establish "closed" PODs (points of distribution). These PODs are designed to expand and facilitate the rapid distribution of life-saving medications to a broader population.

Even during so-called "routine" emergencies, though, additional measures can be taken to increase the speed at which critical patients receive medical attention. Expanding on that topic, Michael Cox discusses a new and more effective protocol that reduces call-processing times at 911 centers and, by doing so, shortens the dispatch time. Joseph Cahill contributes another potentially life-saving suggestion: train coaches and other school staff on the use of automatic external defibrillators for the unfortunate times when a young athlete collapses on the playing field.

There are many other ways to not only reduce response times and improve the response efforts required, but facilitating these efforts usually requires additional funding. Two writers address that already large and still growing concern. James Augustine uses the Boston Marathon terrorist bombings as one example demonstrating the healthy precedent established by paying, in advance, for the material resources needed to reduce the mortality rates during such incidents.

There are several other major concerns about both the present state of U.S. healthcare preparedness efforts and the nation's current funding priorities. Among the many professionals adversely affected by the recent federal government shutdown, for example, are the highly skilled scientists and other staff working in the nation's public health laboratories. Chris Mangal lists those and other negative consequences likely if the legislative and executive branches of the federal government do not make public health a higher and continuing priority in future budget allocations.

About the Cover: Doctors and nurses rush a patient to the operating room during a sudden emergency (iStock Photo). Planning is critical for times when available resources are overwhelmed. The articles in this printable issue of DPJ discuss how members of the public health and non-public health sectors can work together to cope with both small- and large-scale emergencies.

Unknown Chemical or BioHazard?

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Public Health Response & Emergency Management Planning

By Patrick Rose, Emergency Management

Preparing disaster response plans is a difficult task for many reasons, including: the many variables involved, the frequently unanticipated consequences, and the cascading adverse events that emergency managers plan for in today's complex world. Emergency managers must think clearly and effectively about such threats even when they or those around them are not the leading experts on the characteristics of a specific disaster. To confront the daunting task of developing the strategies needed to mitigate the worst-case consequences of a specific disaster, they would be well advised to adopt an all-hazards approach.

Because many aspects of disaster response are somewhat similar, no matter what the emergency, this methodology has certain unique strengths. When the planning is effective, an all-hazards approach can help ensure a relatively quick and efficient response for dealing with a broad spectrum of disasters. However, it also is important to understand the distinctive characteristics of each specific hazard. This is especially true for those responsible for managing the response to public health emergencies.

The Inevitable Public Health Response

To begin with, no matter what the disaster, it will almost always require a public health response. Major natural disasters – floods, tornadoes, and earthquakes, for example – may require the allocation of public resources to care for displaced persons who have functional needs and/or are suffering from chronic health conditions. Terrorist attacks and other manmade disasters may require the allocation of massive medical resources as well – including doctors and nurses, hospitals, and other healthcare facilities.

In such situations, the public health response can be particularly challenging because emergency managers must also try to determine the long-term consequences a disaster will have on the population immediately affected. Among the many, and unusually complex, questions that must be answered are the following:

- How may the rate of illness, and therefore of survival, change if an effective response is delayed or inadequate?
- What countermeasures will be effective in reducing a surge in admissions at hospitals in or near the area(s) directly affected?
- How will the psychological stresses common in public health emergencies drive the attrition rates of first responders and healthcare workers?

Underestimating the needs of both the people affected by a disaster as well as those responding to a public health emergency can quickly lead to deadly mistakes. Knowing precisely how to interpret and manage the operational constraints of a public health response is, therefore, particularly important. Such awareness is especially crucial, of course, when coping with naturally occurring biological incidents (pandemics) or manmade attacks (bioterrorism). The immediate effects of a tornado, earthquake, or even a nuclear incident – the magnitude of destruction involved, and the area of impact, for example – can be predicted with a relatively high level of certainty.

But that is not necessarily true of biological incidents – largely because the exact time a biological incident begins is often uncertain. By the time the incident is detected, the outbreak may be in full swing, with many people already exposed and very sick, even dying. In addition, the geographical and/or demographic extent of a biological incident is often difficult to characterize in its early stages. Unlike a hurricane or tornado, biological pandemics – or even biological attacks – seldom strike with advance notice.

The combination of a pandemic outbreak and a massive influx of visitors from around the world is a major concern for not only public health officials but also emergency planners and government decision makers.

The Expanding Role Played by Emergency Management

There also are other factors to consider. Although a nuclear attack or an earthquake can also be a no-notice event, the deaths and destruction caused will become clear immediately. In contrast, the beginning of a biological incident is almost always profoundly silent. However, whether it is a biological attack or a newly emerging pathogen, the biological agent can quickly infect those who are exposed, frequently without their knowledge. Recognizing that an epidemic/pandemic has started, in fact, often begins with the realization that an unusual illness has spread and/or that a demographic "cluster" of sick people, suffering from the same rare illness, has been diagnosed. The immediate response strategy usually adopted focuses on the need to quickly contain the known or suspected biological agent and, by doing so, reduce the overall threat to public health.

Most emergency managers understand the importance of enlisting the help of public health professionals and incorporating their collective response capabilities into a broader whole-of-community preparedness plan. However, such integration is often not possible until the response phase of a disaster. Moreover, the fact that a public health disaster has occurred is often communicated to emergency managers only after a new incident becomes a major threat recognizable to the general public. Whatever the reason, though, any delay in mounting an effective response during a public health emergency will almost always cost lives that might otherwise have been saved.

Largely for that reason, the approach followed by emergency managers should: (a) be inclusive from the start; and (b) provide accurate threat awareness before the potential event escalates to the level of a true public health emergency. Moreover, public health officials must at the same time manage the local community's expectations of how a coordinated public health response is likely to unfold – with special focus, depending on the specific biological agent involved, on possible operational limitations, supply chain bottlenecks, and/or personnel constraints.

By adopting this approach, emergency managers' planning can focus greater attention on immediate needs and prepare first responders and local communities for what an effective public health response would entail. Among the most immediate needs would be: (a) logistical support – to deploy medical countermeasures; (b) additional security personnel – to manage large crowds of people seeking help; (c) well-trained medical staff – to administer the medical countermeasures and/or other resources needed, both immediately and in the long term; and (d) reception sites and points of distribution – to minimize an overwhelming surge on hospitals. In order to make such plans work effectively, public health officials also should provide the media, and the general public, a clearly stated and well-articulated perspective on current and prospective public health threats.

Pilgrimages & Pandemics – A Deadly Combination?

Coincidentally, the Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV), which emerged in 2012 in the Kingdom of Saudi Arabia (KSA), made headlines globally when several cases were reported by Saudi Arabian public health officials. With the Severe Acute Respiratory Syndrome (SARS) pandemic of 2003 still fresh in mind, public health officials and emergency managers were understandably very concerned. One particularly disturbing similarity between the two newly emerging diseases was that they are from the same family: Coronaviruses. The news media quickly publicized that finding, thereby creating additional global concerns about the still relatively few cases in Saudi Arabia itself that might otherwise have been considered to be a strictly local outbreak.

In early October 2013, well prior to the eve of the 2013 Hajj – i.e., pilgrimage to Mecca, 13-18 October – millions of Muslims had already started to converge on the KSA, where the epidemic is now in full swing. Emergency managers around the globe might understandably view this combination of events as a potential precursor to the next deadly pandemic and start to prepare for a worst-case situation. However, as public health officials were already starting to work more closely on the KSA outbreak with their emergency management counterparts, a better-informed threat awareness was and is leading to a somewhat different planning strategy from the first responder community.

More specifically, the KSA's own public health officials have been working tirelessly to keep their international counterparts better informed about the MERS-CoV outbreak. As they continue to do so, several important facts have emerged that may change the previously perceived threat level of this epidemic. To begin with: (a) The mortality rate has continued to fall as more and more people have been tested positive for, but have not died from, the spread of MERS-CoV; and (b) Some preexisting health conditions have been identified among those considered to be most vulnerable to the virus.

The SARS pandemic, on the other hand, was somewhat more enigmatic – primarily because it did not discriminate, and many previously healthy victims actually died from the disease. Although there is still a need to remain vigilant, it now seems unlikely that MERS-CoV will later develop into a full-fledged pandemic given the current characteristics of the epidemic. This observation does not, of course, rule out the possibility that the MERS-CoV outbreak may later evolve into a more contagious and more deadly pathogen. However, in its current form that possibility does not seem likely.

It is still essential, nonetheless, to bridge the gap between the public health community and emergency managers to plan effective public health disaster response strategies. Being able to convey a clear and concise message from medical observations to the front lines of disaster preparedness not only can make a significant difference but also will help focus the efforts of emergency managers when and where they are most needed.

To briefly summarize, although the threat of MERS-CoV may not be as imminent as previous media coverage has alleged, there are nonetheless certain concerns that still apply to all types of emerging epidemics or biological attack scenarios. For example, the medical community has very few treatment options in its arsenal that could be used if the MERS-CoV outbreak does in fact develop into a pandemic. For that reason alone, U.S. public health officials and emergency managers must develop plans for immediately using such non-medical countermeasures as isolation and quarantine if such cases are detected in local U.S. hospitals. Ultimately, of course, developing a solid partnership between public health and emergency management officials from the start will prepare the entire nation to fully face the next pandemic threat – or even a biological attack – not only more quickly but more effectively as well.

Patrick Rose, a Senior Analyst at Gryphon Scientific, holds a Ph.D. in Microbiology and Immunology from Oregon Health and Science University. Prior to joining Gryphon Scientific, he was a senior policy analyst at the University of Maryland's Center for Health and Homeland Security. He managed numerous projects through the Homeland Security Exercise and Evaluation Program and was an instructor for the Senior Crisis Management Training Program at the U.S. State Department's Office of Anti-Terrorism Assistance. He previously held positions at the National Institutes of Health and the Los Alamos National Laboratories. In addition, he was a National Research Service Award postdoctoral fellow at the University of Pennsylvania.

Healthcare Preparedness – The Resilience Challenge

By James J. Augustine, Health Systems

Five years ago, a *DomPrep Journal* article "The Design of the Future U.S. Hospital System" proposed a significant shift in the roles played by U.S. hospitals in general, and by their emergency departments in particular, in the preparedness plans developed to cope with major incidents. As community resource centers, hospitals would be assigned a principal role in delivering effective and comprehensive healthcare even in the worst of circumstances. The challenge today, though, is to meet that daunting concept with current needs in preparedness, and in a still evolving health system.

The high marks given to the lifesaving role played by local hospitals during and after the April 2013 Boston Marathon bombings provided a critical demonstration of the positive aspects of health system preparedness. Nonetheless, the nation's hospitals and healthcare providers are now once again at a crossroads in setting priorities and allocating limited funding.

The Terrorism Dilemma: Prevention vs. Resilience

Many publications have noted the need for change in preparedness priorities at the federal level. In a 29 July 2013 article published in *Bloomberg Businessweek*, for example, staff writer Devin Leonard discussed the planned movement of various branches of the U.S. Department of Homeland Security (DHS) to a new, central, and more easily protected location in the southeastern quadrant of Washington, D.C. The article also noted the various changes in organization, culture, and budget that have taken place in recent years of this relatively young federal agency. With 240,000 employees and an annual budget of $60 billion or so, DHS is still under significant scrutiny about the safety and cost effectiveness of many of its more ambitious programs (some of them still untested).

The *Bloomberg* article suggested that the billions of dollars spent for border protection and transportation safety are not cost effective. In an era of fiscal constraints, some analysts have suggested that much of that funding could be better spent by a shift from the prevention of terrorism to an increased emphasis on "resilience." The same analysts also argue that a more cost-effective way of coping with terrorist threats would be to develop the capacity to recover and rebuild when terrible events – whether natural or as a result of human actions – do occur.

Adoption of that approach, though, might well mean that at least some relatively costly Pentagon weapon systems would receive less funding. But, in return, more funding would be available for healthcare providers, local public safety forces, and first responders. The latter resources are the ones that saved lives and impacted communities following: the Boston Marathon bombings; Hurricanes Katrina and Sandy, which caused numerous blackouts; the explosion earlier in 2013 of a fertilizer plant in West, Texas; and the 2011 tornadoes that devastated Joplin, Missouri, and Moore, Oklahoma.

The article further suggested that the many linkages built at the local level in recent years are the ones that would be most useful in managing future crises. In Boston, on-scene emergency medical personnel handled the crisis quickly and effectively, moving dozens of injured people through triage tents and into hospitals – most of them within a matter of minutes. Surgical resources – operating rooms, trained surgeons, and a broad spectrum of medical systems and equipment – also were immediately available, and the combination of rapid triage and transport, plus immediate access to operating rooms, clearly reduced the death toll. It should be noted, of course, that the greater Boston area possesses extensive and high-quality healthcare resources – including the operational experience of numerous highly trained medical practitioners – and also has a rich tradition of sophisticated disaster planning and drills.

Addressing the Global Threat Environment

There has certainly been a change, in recent years, in the global threat environment. The Boston bombing attacks – which followed other low-budget and relatively low-sophistication events such as the Eric Rudolph bombings, the Oklahoma City tragedy, and several domestic terrorism attacks in which anthrax was used – strengthen what seems to be a growing need for: (a) more effective all-hazards preparedness; and (b) the development of more effective resilience at the local level.

Another factor to be considered is that the need for improved health system preparedness occurs simultaneously with the massive plans to change the basic economics of the U.S. healthcare system. The current political/budgetary battle in Congress on funding the Patient Protection and Affordable Care Act (PPACA, or Obamacare) is one of the more visible efforts to prioritize the health of the general public. No matter what else happens, it seems clear that the hospital role as the primary site of acute care is being replaced, at least in part, by the hospital as a major hub of medical information, qualitative medical improvements, and improved health for the entire community.

Many metropolitan areas now have workgroups that link hospitals more closely with public health and public safety. To achieve compliance with the federally mandated National Incident Management System (NIMS) requirements, for example, local hospitals must participate much more closely than ever before in community all-hazard planning. Public health agencies also are cooperating to: (a) help facilitate the more active role played by the U.S. Centers for Disease Control and Prevention (CDC), which has been developing and sharing some very important healthcare primers on terroristic health threats; and (b) to speed the activation of regional surveillance systems to help them cope with an already large, and increasing, number of biological threats.

What must come next is more effective use of community resources for disaster preparedness to replace the shrinking budgets of hospitals required to provide more comprehensive acute care for patients. Matching resources can be effectively carried out, though, only with knowledge of local hazards and local assets. Innovative funding for hospitals and public health functions must represent a value proposition for the community. Fortunately, evaluating emergency preparedness priorities and available funding has been an increasingly valuable skill set for emergency management agency planners as well as for finance and other "resource" officers within fire departments, police agencies, and public works offices.

National Preparedness & Security Programs

In line with these local planning efforts is the concurrent need for a commitment of federal dollars – repurposed, perhaps, from other less-effective preparedness and security programs. The Hill-Burton Act (Hospital Survey and Construction Act of 1946) was the federal government's principal post-World War II effort to fund improvements of the physical plant of the nation's hospital system to enhance preparedness. The same Act still provides a legal and financial foundation for federal funding of local medical preparedness plans and exercises.

When focusing on the resources needed to create a more resilient healthcare workforce, hospital and healthcare planners can find several relevant planning documents for these efforts – the National Fire Protection Association Standard 1600 (NFPA1600) is one good example. What is officially called the Standard on Disaster/Emergency Management and Business Continuity Programs includes provisions that outline the development, implementation, assessment, and maintenance of programs for prevention, mitigation, preparedness, response, continuity, and recovery. A critical element of those provisions focuses on the continuity of operations, a particularly important component of the overall national healthcare system.

Financial resilience, for many reasons, is important to every community. The economic disruption caused by the Boston bombings has been estimated to be about $300 million, with some of that cost borne by the local health systems involved. There still are major questions, though, about the ability of most U.S. cities and states to build better systems that can quickly restore continuity of operations after a major destructive incident has actually occurred.

One troubling factor does seem certain, though: Other would-be terrorist groups are now fully aware that a major metropolitan area was almost totally neutralized for almost a week, by a relatively unsophisticated act of terrorism that was carried out by two brothers. If nothing else, the United States now has an opportunity to design and train the providers needed to restore operations rapidly after an incident. Using that opportunity well is at the heart of resilience, and may well serve as a timely challenge in determining the allocation of more resources from the federal government to state and local agencies.

James J. Augustine, M.D., is an emergency physician who serves with the Atlanta Fire Rescue Department and Hartsfield Jackson Atlanta International Airport. A clinical associate professor in the Department of Emergency Medicine at Wright State University in Dayton, Ohio, he previously served as chair of ASTM Task Group E54.02.01, which developed ASTM Standard E2413 on Hospital Preparedness, under Committee E54 on Homeland Security Applications. He also served as chair of the Atlanta Metropolitan Medical Response System.

Public Health & the Congressional Budget Standoff

By Chris N. Mangal, Funding Strategies

In 2002, the U.S. Congress authorized funding for public health laboratories through the Public Health Emergency Preparedness Cooperative Agreement. Administered by the U.S. Centers for Disease Control and Prevention (CDC), this Agreement has given the nation's taxpayers a significant return on investment. To date, CDC has invested billions of taxpayer dollars in state and local public health preparedness programs and helped to achieve its institutional goal to strengthen the nation's basic health infrastructure, expand partnerships, and enhance disease surveillance systems. However, the decline in federal funding in recent years, and several delays in approving future budgets, could continue to jeopardize the significant successes already achieved at the state and local levels.

The Role of State & Local Agencies

State and local government agencies responding to anthrax or ricin attacks and/or other emerging threats – as well as such emergencies as the SARS outbreaks and the Influenza A H1N1 pandemic – rely primarily on federal funding and technical support from CDC to mount effective responses to these difficult and unforeseeable events. To cite but one recent example, the CDC is already very busy behind the scenes preparing members of the nation's Laboratory Response Network to respond to the emerging Middle East Respiratory Syndrome Coronavirus.

This effort does not in any way, though, lessen the continuing support from the CDC that already has enabled state and local public health laboratories to:

- Prepare for such major and recurring national events as the Super Bowl and the Democratic and Republican National Conventions;
- Carry out routine testing throughout the year to distinguish potentially lethal white powders from their benign "look-alikes";
- Detect emerging threats such as the dengue virus, SARS, and Influenza A H1N1;
- Increase the growing number of Biosafety Level 3 facilities available, which allow scientists to work safely with biological threat agents;
- Expand the size and capabilities of the previously mentioned Laboratory Response Network for Chemical Threat Preparedness;
- Develop additional training courses on such esoteric topics as biosafety, the packing and shipping of infectious substances, and the detection and transfer of threat agents;
- Plan for and help develop a growing number of nationwide healthcare competency programs and full-scale preparedness exercises;
- Participate in a growing number of outreach programs to the nation's first responder and sentinel clinical laboratory communities; and
- Evaluate new assays and platforms for the rapid detection of threats.

The CDC Public Health Emergency Preparedness funding also has strengthened the entire public health laboratory infrastructure via: (a) the recruitment of highly skilled personnel; (b) the training of laboratorians to help facilitate the responses to a broad and growing spectrum of biological threats; (c) the purchase/funding of additional state-of-the-art equipment, maintenance contracts, critical reagents, and other material supplies and resources; (d) the implementation of new systems for electronic communications and data messaging; (e) the enhancement of new and innovative partnerships with private clinical, local public health, food, agricultural, environmental, military, and academic laboratories; (f) the continuity of operations planning needed to support critical testing; and (g) the expanded and improved engagement of state laboratory network partners – most notably during the 2009-2010 H1N1 pandemic when many states were able to effectively use the CDC networks during their own responses.

New Budget Cuts & Standoffs: The Dangerous Consequences

The nation's public health laboratories are the backbone of the Laboratory Response Network, the nation's premier network for responding to public health threats. Any funding reductions could seriously jeopardize the CDC's ability, therefore, to continue its vital testing and surge-capacity responsibilities. To begin with, any reductions in laboratory capabilities and capacity would limit the ability of various laboratories to provide testing support for the Federal Bureau of Investigation and other law-enforcement agencies, and at the same time increase the testing burden on federal laboratories that are already stretched thin.

The very existence of laboratories that perform testing for biological and chemical threats also would be threatened, thereby limiting the nation's overall ability to rapidly test for and respond to various acts of biological, chemical, or radiological terrorism. Additional reductions in federal funding would also:

- Decrease the overall capability of the Laboratory Response Network chemical threat laboratories, which would be forced to either drop below a certain level of functionality or even close their facilities;
- Limit the ability of laboratories to purchase the testing supplies and reagents needed to cope with large-scale events;
- Increase the reporting times needed during public health emergencies, which in many cases would translate directly into unnecessary morbidity and mortality;
- Strain existing partnerships and the communications with other non-laboratory entities;
- Decrease the ability: (a) to work with international partners; and (b) to evaluate and work with the newer technologies now emerging;
- Increase the difficulty both to maintain current instruments and to pay for service contracts;
- Reduce the travel funds available for attendance at important meetings and training conferences; and
- Limit the ability to rapidly transport samples to and from laboratories.

There are many other adverse consequences of new budget cutbacks that also must be taken into consideration. Some state public health laboratories, already reeling from existing budget reductions, would undoubtedly lose at least a few highly skilled staff members. As a result, these laboratories would experience: (a) longer response times for all-hazard threats ranging from foodborne outbreaks to acts of biological and chemical terrorism; (b) a reduced ability to provide training for and outreach to the thousands of sentinel clinical laboratories and first responder/hazmat organizations that would likely be the first in line to obtain samples during an emergency; and (c) fewer skilled response personnel available to run complex instrumentation and perform necessary analysis.

To briefly summarize, virtually all state and local health agencies throughout the nation were already feeling the effects of recent federal funding reductions. The prolonged federal shutdown earlier this month, however, increased and compounded the difficulties already encountered. With so many federal personnel furloughed, only limited technical support was immediately available to help laboratories maintain their vitally important surveillance programs and disease-detection missions. For instance, during the shutdown, one state was unable to access CDC subject matter experts for guidance confirming ricinine in a case of suspected ricin poisoning. In ricin events, ricinine is the biomarker looked for in urine.

In short, the federal funding shutdown placed a significant – and, it could reasonably be argued – unnecessary burden on all state and local health agencies throughout the nation. What is even more worrisome, though, is that the threat of yet another federal shutdown looms dangerously just over the horizon.

Chris N. Mangal, MPH, is the director of public health preparedness and response at the Association of Public Health Laboratories (APHL). The recipient of a bachelor's degree in microbiology from the University of Florida, and of a master of public health degree from the University of South Florida, she is responsible for providing programmatic and scientific leadership for preparedness activities for APHL members, staff, and partner organizations, such as the U.S. Centers for Disease Control and Prevention (CDC). She has more than 10 years of experience working to improve laboratory practice in the detection of public health threats, and to expand and enhance the relationships between APHL member laboratories and CDC, other federal agencies, and private organizations involved in emergency preparedness and response, public health testing, policy, and training.

Ready & Able – But Not Always Willing

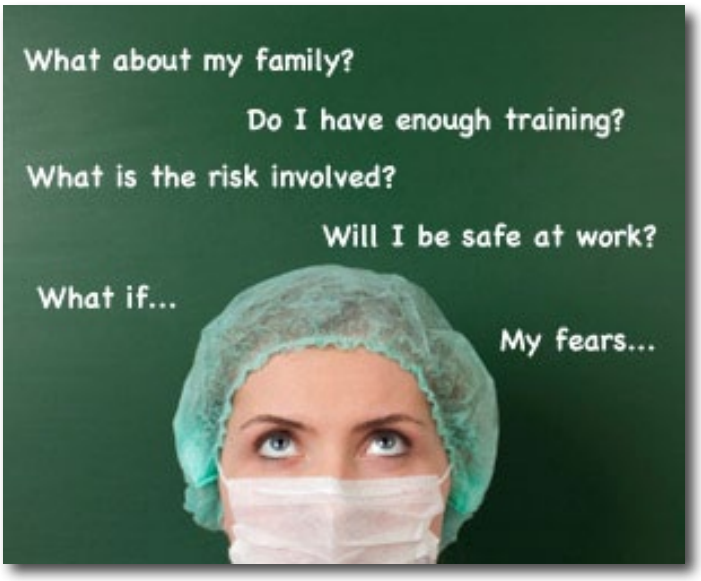
By Raphael Barishansky & Audrey Mazurek, Public Health

Public health agencies play a central role in responding to many different types of man-made and natural emergency situations – including, but not limited to, outbreaks of pandemic influenza, biological attacks, radiological incidents/events, and extreme weather emergencies. Unfortunately, the increased number of multi-casualty incidents in recent years (e.g., the 9/11 terrorist attacks, Hurricane Katrina in 2005, the 2009-2010 H1N1 pandemic, and even the 2011 earthquake and follow-on tsunami in Northern Japan) has changed the perspectives of many healthcare workers on how sudden disasters personally affect them and their families.

In addition, the willingness of health responders to report to duty during a public health emergency, particularly a widespread influenza pandemic, is no longer certain, and for that reason has become an important concern. Despite increased public awareness of the threat posed by multi-casualty incidents, biological attacks, and other public health disasters, the emphasis on preparing the U.S. healthcare work force to cope with such disasters has been less than adequate. Recognizing the unwillingness of at least some public health personnel to report to work, and the various factors contributing to that mindset, has added a new complication for at least some public health agencies as they seek to move forward with effective response plans.

Public Health Responsiveness: The Operational Realities

The most effective personnel who respond to public health emergencies are usually knowledgeable in more than one area of specialization. According to a 2010 report issued by the National Association of County and City Health Officials (NACCHO) on the topic of local health department capabilities, the departments surveyed by the association reported that, within the 12 months immediately prior to the survey, they had responded to a broad spectrum of emergencies ranging from infectious diseases (26 percent of the incidents) and natural disasters (23 percent) to foodborne outbreaks (21 percent), chemical spills or releases (9 percent), exposure to one or more potential biological agents (5 percent), and a long list of "others" (16 percent).



The responsibilities assigned to public health agencies in an emergency are not limited to the specific types of incidents listed above. Most agencies also are called upon to respond in various ways to such weather emergencies as hurricanes and major snowstorms. These duties cover a broad spectrum of capabilities – including but not limited to health system readiness, mass care responsibilities (e.g., the provision of shelters where, when, and as needed), public information and communications, the coordination of behavioral health services, epidemiological surveillance/investigations, food safety inspections and monitoring, and the responses to and investigations of various environmental hazards.

Working in close coordination with Columbia University, the Greater New York Hospital Association and Loyola College in Baltimore developed and carried out a 2005 New York survey with workers from 47 healthcare facilities – located in New York City and the surrounding metropolitan area – to determine the ability and willingness of individual employees to report to work during various catastrophic events. A relatively broad range of facility types and sizes was represented in the sample. In terms of individual willingness, the healthcare workers from all types of facilities said they were "least willing" to respond during a chemical event or incident (68 percent), a smallpox epidemic (61 percent), a radiological event (57 percent), and/or a SARS

(sudden acute respiratory-distress syndrome) outbreak (48 percent). The reasons for such personal reluctance cited by those surveyed included transportation problems, fear and emotional concerns for their families (and for the responders themselves), and personal health fears. Surprisingly, none of these "fear factors" are particularly difficult to address.

At least one element of a public health emergency response is cultural in nature. Unlike more "traditional" first-responder organizations – e.g., police and fire departments, and emergency medical services (EMS) agencies – the capacity and willingness of health department workers to respond to crises on a 24/7 basis is not historically ingrained in the professional cultures and training of the individual work forces involved. Even in the post-9/11 environment, according to 2005 data from the non-profit RAND Corporation, the after-hours responses by health departments to urgent events has been inconsistent and sometimes slow, even when the responses involve such traditional public health issues as communicable diseases.

Understanding the Reasons Why

To fully understand why such changes have occurred, it is important to first examine the reasons behind the unwillingness of public health workers to place themselves at risk of exposure to emerging infectious diseases. An earlier RAND article published in 2004 observed the emotional and behavioral consequences of such reluctance both during the 2003 SARS epidemic and in the early years (1980s) of the HIV/AIDS epidemic.

In the aftermath of the 9/11 terrorist attacks, and the anthrax attacks shortly thereafter, a growing body of research literature closely examined the personal willingness of a broad spectrum of healthcare professionals to respond to large-scale emergencies. Despite the evidence for fundamental distinctions between personal abilities and the willingness to respond, there remains a gap in the public health preparedness literature on the various approaches that explicitly address response willingness as a separate and specific training goal.

A study conducted in 2006-2007 and funded through a cooperative agreement with the U.S. Centers for Disease Control and Prevention measured the willingness of public health personnel in three states (Minnesota, Ohio, and West Virginia) to respond to a pandemic by: (a) measuring individual degrees of perceived threat (concern) and perceived efficacy (confidence); and (b) determining how those variables influenced their willingness to respond. The study found that personnel who had a perception of both high threat and high efficacy – i.e., a high threat to public health, but well trained, well educated responders – also expressed the highest self-reported willingness to respond to a pandemic flu.

The same study reported that 16 percent of the workers surveyed were *not* willing to "respond to a pandemic flu emergency, regardless of its severity." This conclusion is not surprising. The workload in public health agencies during a pandemic is immense, and an "all-hands-on-deck" approach is therefore required to meet the numerous challenges encountered, particularly when those challenges include significant changes from daily roles and responsibilities. Even so, the reported unwillingness to respond – by approximately one out of every six public health professionals – means that additional efforts are required to increase and sustain the overall percentage of local health department employees still willing to respond to dangerous emergencies of all types.

Several other studies of first responders – particularly in the public health and healthcare fields – reveal that a common concern about family safety is a major obstacle among those unwilling to report to work. Following are a few examples of significant findings derived from those studies:

- A 1991 survey by members of the Israel Defense Forces Medical Corps – which examined the willingness of Israeli hospital personnel to report to work in response to an unconventional missile attack – drew several conclusions similar to those mentioned in the other surveys cited above. The majority of the Israeli respondents said that the need to care for their families was one of the principal reasons for their unwillingness to report to work.

- The previously mentioned 2006-2007 study of healthcare workers in New York City revealed that family issues adversely affected both the willingness (concern for family) and the ability (childcare, eldercare, and pet care) of hospital workers to report for duty.

- A 2010 study published in *The Australian Journal of Emergency Management* analyzed responses from 1,600 front-line staff of a regional health-service provider in Australia about their sometimes uncertain willingness to report to work during three types of public health emergencies: a major weather event; an influenza pandemic; and a bioterrorism incident. That study also reported "family preparedness" as one of the three most important variables associated with a greater willingness to report to work during all three scenarios.

- A national study conducted by Columbia University in 2005 revealed that "concern for family" led the list of reasons why the EMS (emergency medical services) personnel surveyed might *not* be willing to respond in the wake of a major bioterrorist attack, a chemical incident, and/or a nuclear disaster.

- A 2010 study, published by *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, focused on paramedics in Australia and concluded that recent chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) training and a high degree of perceived personal resilience were the principal positive factors associated with the highest recorded level of CBRNE response readiness.

Organizational Responsibilities – Training & Personal Protection

Organizations of all types – specifically including not only traditional response agencies (fire and police departments, and EMS units), but also other agencies (primarily public health) with newly developed emergency response roles – have a specific responsibility to ensure that employees respond quickly, where and when needed. Communicating the organizational goals expected in responses and providing the working tools needed by responders (and sometimes their families) to properly prepare are critical elements in ensuring a quick and effective response.

The importance of training as a variable in determining the willingness to respond is supported by another 2002 study that focused on preparedness training for public health nurses. That study, published in the *Journal of Urban Health*, found a 12-percent increase in the expressed intention of nurses to report for assignment after participating in the training. That was similar to the findings in the aforementioned national study by Columbia University in 2005, which determined that EMS providers who had received continuing medical education – specifically related to terrorism, though – were twice as likely to be willing to respond to potential terrorist-related incidents (e.g., smallpox outbreaks, chemical attacks, and/or radioactive dirty bombs) as those who had not received such training.

Another critical policy issue that is dynamically intertwined with the "willingness to respond" mindset is ensuring that responders are provided the personal protective equipment (PPE) they need to safely and effectively carry out their assigned duties. Many of the studies cited above confirmed that the willingness of responders to report is adversely affected not only by family concerns but also by fears for their own personal safety. Interestingly, those responders who are in fact issued, and are comfortable in using, proper PPE gear also seem to be less apprehensive, particularly in responses to biological or similar incidents – even when the potential exists to transmit a sudden illness from responders to family members.

A 2008 study, conducted by St. John Hospital and Medical Center in Detroit, Michigan, of hospital personnel during an avian influenza pandemic supports the same conclusion. The Detroit study asked a number of personnel if they would report to work during a pandemic situation; response categories were "yes," "no," and "maybe." For the "maybe" responders, the most important factor (83 percent) was their individual and collective answers to one important question: "How confident am I that the hospital can protect me?" Somewhat surprisingly, 19 percent of the respondents said that financial incentives would not make a difference in their decisions, even if their normal pay were tripled. The study concluded, among other things, that the importance of providing adequate protection for the work force itself "may be very helpful in minimizing absenteeism."

The aforementioned study of Israeli hospital workers supports the same point. In that study, 86 percent of respondents said that they would report for assignment if adequate safety measures were in place.

Encouraging Responses From Public Health Personnel

The U.S. model of all-hazards emergency readiness has presented state and local health departments with several organizational challenges as well as some new learning curves. The all-hazards approach requires both the ability

and the willingness to respond to a broad spectrum of disasters ranging from intentional CBRNE incidents to forces of nature such as hurricanes, earthquakes, and non-bioterrorism infectious-disease outbreaks.

Local health departments are considered the true backbone of public health responses to any and all infectious disease outbreaks. In addition to dealing with numerous issues and concerns over precisely *how* to prepare for and respond to emerging infectious diseases (e.g., H7N9 and MERS CoV), they must also be able to cope with influenza pandemics. In fact, many public health professionals classify such pandemics as one of the most significant and urgent threats facing the nation's overall preparedness infrastructure.

As public health agencies and personnel have moved more definitively into new and more demanding emergency preparedness and response roles – at the same time that the emergencies have become both larger and more diverse (including, but not limited to pandemics, foodborne illness, anthrax attacks, etc.) – the question of willingness to respond comes into play. As mentioned previously, the primary reasons for some personnel to not respond during a public health emergency involve training, personal protection, and the safety of family members.

When developing disaster response plans and assessing ways to appropriately deal with various issues affecting the willingness of individuals to respond, U.S. public health authorities should consider a tentative plan of action that includes the following steps:

- Determine the type and size of the staff required, and their individual and collective roles, beyond simply writing names on an Incident Command System (ICS) organizational chart. It encompasses a buy-in from leadership and all staff, appropriate notification to staff, and adequate as well as relevant training.

- Accurately determine the most likely threats to staff and their families resulting from fulfilling their assigned roles, then determine the definitive steps needed to appropriately address such threats and various other concerns.

- Provide basic education on such important topics as disaster responses, the threats posed by different types of disasters, and the roles staff may be asked to fulfill. Do not presume that individual health workers automatically know their assigned roles.

- Develop the strategies needed to build staff confidence in their individual and collective assignments, as well as to mitigate risk in the workplace. To do this properly requires effective training, including frequent and realistic drills and exercises to test and improve work force competency.

- Develop similar strategies to ensure that staff members fully understand the importance of their individual roles – and provide them the tools to help their families function effectively during and after a disaster.

- Develop strategies to maintain the knowledge base and professional engagement of all members of the health work force.

In addition to a broad spectrum of training elements – including but not limited to drills, call downs, and exercises – this specific area of engagement has the potential to be one of the more important personal elements that can spell the difference between an effective or ineffective emergency response. Public health agencies must understand and address myriad issues through the planning process, specifically including: (a) the need to let public health providers know there are sufficient resources (specifically including personal protective equipment and antivirals) provided to them; and (b) achievable solutions for issues involving family care and other concerns.

The final step is to carefully review after-action reports to determine: (a) who actually came to work during an emergency – and who did not; (b) *why* each member did or did not report; and (c) what constructive steps can be taken to address this important issue. The combination of all of these actions will help to ensure that a competent and confident response by public health personnel can reasonably be expected when the next disaster occurs.

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Audrey Mazurek is a technical specialist at ICF International and a public health preparedness planner for the Prince George's County and Montgomery County (Maryland) Health Departments. She also serves as an adjunct analyst at the Homeland Security Studies and Analysis Institute (HSSAI). Prior to assuming those positions, she was a program manager at the National Association of County and City Health Officials (NACCHO).

When the First Down Becomes the Worst Down

By Joseph Cahill, Standards

Twenty years ago, at the age of 27, Boston Celtics player Reggie Lewis collapsed and died on the basketball court. Whenever a young athlete collapses on the field of play, the community cries out for a solution. The most common causes of death in young athletes are cardiac-related issues – an electrical abnormality, a vascular malformation, or a hypertrophic cardiomyopathy.

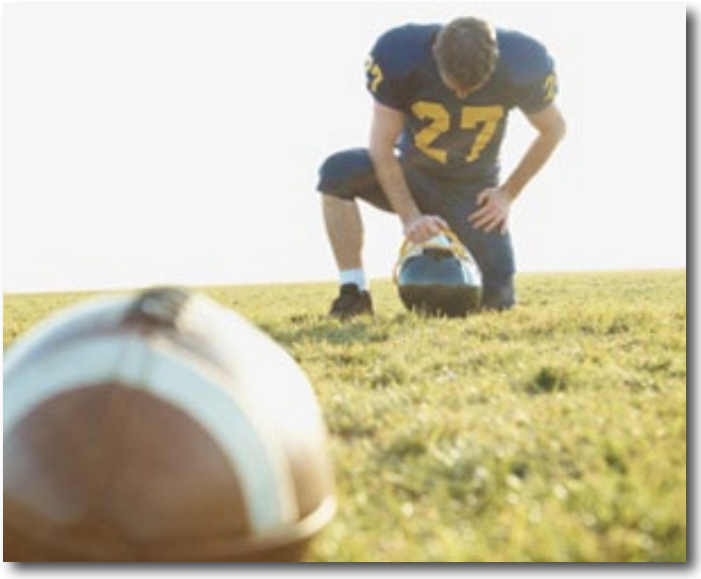
The comprehensive screening of all student athletes is one possible solution, but mandating such procedures may be prohibitively expensive and intrusive. However, for some young people – i.e., those with a history of unexplained fainting, who experience chest pain or shortness of breath, and/or who have a family history of sudden death – comprehensive screening certainly would be appropriate.

Survival Rates & Authoritative Studies

According to the American Heart Association's current CPR (cardiopulmonary resuscitation) Statistics Fact Sheet, nearly 383,000 out-of-hospital cardiac arrests (OHCAs) occur annually in the United States. Moreover, the U.S. Centers for Disease Control and Prevention (CDC) reported in 2010 that, nationally, only about eight percent of all people survived who had experienced cardiac arrest when medical staff were not present.

Fortunately, for those who collapse because of an electrical abnormality known as ventricular fibrillation, an automatic external defibrillator (AED) can serve as a lifesaving device. In fact, the same 2010 CDC report also pointed out that the survival rate doubles or even triples when an AED is used to fire an electric charge through the victim's heart – and, by doing so, forces the heart to settle back to a normal heartbeat.

Many other reports have been published that compare survival rates when AEDs are used and when they are not used. One example is a 2010 study – conducted by the Catholic University of the Sacred Heart in Rome, Italy – which concluded that, "Our meta-analysis add to previous evidence in favour of developing public-health strategies based on AED use by trained lay-rescuers."



Although AEDs and similar devices have become ubiquitous in many public venues throughout the United States, they are still not widely used. The 2010 CDC report also pointed out that the rate of AED use before the arrival of EMS (emergency medical services) teams "is only 2% for all OHCA events, and 8% for OHCA events in a public setting." Among the most obvious sports venues with room for improvement in this area are the football fields, basketball courts, and baseball diamonds in communities throughout the country. AEDs offer several benefits in favor of more widespread use. For example, they: are relatively inexpensive; need little or no maintenance; require minimal consumables – often restricted to single-use adhesive electrodes; are relatively easy to operate; and are designed primarily for public access defibrillation programs (for which training in advance is not assumed).

In addition to AED use, a truly effective planning effort must be made to: (a) direct how staff should request help through 9-1-1 calls; (b) determine what if any additional actions should be taken; and (c) identify staff responsibilities to communicate with facility/program leadership. The training required for members of athletic department staff – both in CPR and in the facility/agency plan – would take less than two days of training time per person.

Fortunately, in a 19 May 2011 article, the Mayo Clinic reported that the instances of OHCA in young people

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are rare. In fact, the Sudden Cardiac Arrest Foundation – a 501(c)(3) organization based in Pittsburgh, Pennsylvania – estimates on its website that there are only around 1,000 cases annually in the United States. This raises an obvious question, "Even if the outlay is modest, isn't there some other point where the same funding would do more good?" The answer is an emphatic but obviously not definitive "Maybe." In a community where there is no AED in a senior center or other facility – anywhere there is a higher likelihood of an OHCA, in other words – that community may in fact save more lives with the AED in the senior center than on a high school athletic field.

Avoiding Unnecessary Delays

Regardless of the cost factors involved, it is nonetheless clear that, during and immediately after any cardiac arrest, the first and worst factor that adversely affects the survival of the victim is delay. Almost as soon as the heart stops beating – and blood flow to the brain therefore ceases – the victim's brain cells become distressed. Within four or five minutes, the brain cells have been severely damaged and most victims already have been lost. On the other hand, numerous studies have shown that the chances for survival almost double when someone starts CPR immediately. In addition, use of an AED, applied shortly after CPR is initiated, further increases the chance of survival.

Massachusetts Governor Deval Patrick signed legislation in May 2012 requiring public schools throughout the state to develop more efficient medical emergency response plans. That legislation, known as "Michael's Law," was written following the 2010 death of 16-year-old Michael Ellsessar, a high school student who suffered a cardiac arrest while playing football. The new Massachusetts law requires that local school districts:

- Develop a method for establishing a rapid communication system and accompanying protocols;
- Create a way to efficiently direct emergency medical services (EMS) teams;
- Require implementation of the safety precautions needed for injury prevention;
- Provide access to CPR and first aid training; and
- Inform staff about locations of defibrillators and the names of personnel who have been trained in the use of AEDs.

The factors that make the OHCAs of young athletes different from OHCAs in the general public include the following presumptions: (a) their collapses are more likely to be witnessed at the time, rather than discovered sometime later; (b) school staff members usually are present at sporting events, and can be trained in advance; and (c) the OHCAs of younger athletes are less likely to involve comorbidities – i.e., multiple medical conditions contributing to the collapses. Considered as a package, these factors should and probably would improve the effectiveness of an AED program and, therefore, the survival rate of these young OHCA victims.

Joseph Cahill is the Director of Medicolegal Investigations for the Massachusetts Office of the Chief Medical Examiner. He previously served as exercise and training coordinator for the Massachusetts Department of Public Health and as emergency planner in the Westchester County (N.Y.) Office of Emergency Management. He also served for five years as citywide advanced life support (ALS) coordinator for the FDNY – Bureau of EMS. Prior to that, he was the department's Division 6 ALS coordinator, covering the South Bronx and Harlem. He also served on the faculty of the Westchester County Community College's Paramedic Program and has been a frequent guest lecturer for the U.S. Secret Service, the FDNY EMS Academy, and Montefiore Hospital.

Functional Needs – Awareness Is a Two-Way Street

By James Martin, Viewpoint

October is National Disability Employment Awareness Month, and is specifically dedicated to implementing the mandate spelled out in the 2010 presidential Executive Order 13548: "Increasing Federal Employment of Individuals With Disabilities." That awareness also serves as a reminder that the nation's emergency responders and receivers must be prepared to handle people suffering from a broad range of physical and psychological disabilities. According to the U.S. Department of Health and Human Services' Office on Disability website, an estimated "one in every five people" has some type of disability. Moreover, as time passes, "the likelihood of having a disability of some kind increases."

Of course, those suffering from various disabilities must constantly overcome and adapt to physical and psychological barriers to preserve their livelihoods on a daily basis. However, in times of emergencies, natural disasters, and other incidents that disrupt daily routines, the community of people with disabilities tends to expand to encompass many additional persons with "functional needs."

Educating Those With Existing Functional Needs

According to the Federal Emergency Management Agency (FEMA) website, Functional Needs Support Services (FNSS) are defined as "services that enable individuals to maintain their independence in a general population shelter." In addition, according to the November 2010 Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters, "Children and adults requiring FNSS may have physical, sensory, mental health, and cognitive and/or intellectual disabilities affecting their ability to function independently without assistance."

Unfortunately, even though there is usually some level of planning already in place to assist disability communities before various disasters/emergency incidents actually occur, a broad range of actions addressing issues that might easily occur during and after such incidents have not yet been fully examined. Evacuations, for example, and sheltering either in place or in a previously designated shelter, require additional planning for those with functional needs. After a disaster strikes, moreover, another type of functional-needs group emerges – those with "newly acquired" disabilities.

People with existing disabilities have had time, in many cases, to develop at least some level of independence and already know how to address their personal needs and how to follow specific regimens for being resilient before, during, and after various types of disasters and/or other emergencies. However, even this prepared community usually needs more information about the "real" expectations they might reasonably have about first responders. If members of this community understand that, sometimes, their best course of action is simply to get out of harm's way, proper planning by those in the functional needs community can actually help first responders better allocate their limited time and available material resources.

With an acceptable support system in place, those with disabilities can personally help to ensure that a plan is in place: (a) for someone to help them evacuate; (b) to shelter in place or somewhere other than where they live; (c) to have transportation available when needed; and, perhaps most important of all, (d) to manage their own immediate medical needs. Plans for providing additional medications and such other medical needs as oxygen tanks, surgical dressings, and wheelchairs would help avoid dependency on first responders to provide these resources, which are already in high demand during emergencies when responder agencies are most likely to be overwhelmed. In addition, better planning by persons with existing disabilities would allow more time for responders to attend to higher priority situations.

Educating Receivers as Well as Responders

From the responder as well as receiver perspectives, managing those persons with functional needs in the wake of a disaster is obviously to be expected, but there is much more to consider than the more visible injuries or disabilities. Lives are sometimes lost during a particularly traumatic situation – a spinal cord injury, the amputation of a leg or an arm, a traumatic brain injury,


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and sudden blindness and/or deafness – for which no amount of training could fully prepare even the most conscientious responder.

Moreover, these particularly unfortunate people often do not yet grasp the reality of their own injuries and cannot yet imagine their future lives as persons with such disabilities. Today, the Boston Marathon images of responders and nearby citizens carrying and otherwise transporting victims with lost legs or arms from the incident scene still evoke strong mixed emotions. In addition, the after-action investigations and reports have developed and publicized a number of important "what if" questions, including the following:

- What happens in such situations if there are no medical facilities and ambulances nearby?
- What else would have happened if there had been even worse traffic congestion stalling the transportation of survivors to the medical facilities?
- What if the victims included persons with preexisting physical disabilities who were unable to use normal transportation?
- What if there had been no taxicabs and buses, fitted with the lift equipment needed?
- What if there had been no way to quickly move some of the victims away from what might have been other potential bombs?

The lessons learned from the Boston bombings boil done to the fact that any combination of people with existing disabilities and others with newly acquired disabilities generates added concern about the lack of supplies, equipment, and other resources for the functional needs community. To lessen such stress, there are many planning considerations that planners must address, the most important of which are: (a) the number of people who require care; and (b) the services and equipment most likely to be immediately available to cope with unexpected incidents.

First responders often prepare to help with persons with newly acquired disabilities, but it is a reality that they may never be fully ready to face. Planning for mass casualties and preparing for shelters is just a small step forward in resolving this dilemma. Face-to-face planning encounters also make a huge difference. Knowing how to address the disability community's needs is another step forward, but the human and humane factors involved are just as important. Among the non-classroom capabilities needed are the following:

- Communicating with deaf persons, even if only to help navigate them out of the way during an emergency;
- Providing safety for blind persons, while also preserving their dignity;
- Ensuring that people with physical disabilities are not left in uncomfortable places or in positions that would require further medical attention at a later time – with no, broken, or battery-less equipment, for example; and
- Helping to prevent persons suffering from mental/emotional disabilities from feeling anxious, afraid, and deprived of a safe space.

Above all, it is particularly important for communities as well as individual responders to remember, not just in October, to reinvest in disability awareness by including additional and upgraded training for all responders. By training police officers, firefighters, paramedics, and other first responders on the "etiquette" as well as respect that those with disabilities deserve and should receive, responder/receiver agencies also can help build a more resilient functional-needs community at the same time. This will continue to be true, regardless of the type, nature, and size of the disaster or incident. Taking the time to address all functional needs in a positive and caring way will help members of the functional needs community feel much more independent, even when faced with a major disaster or other emergency situation.

James Martin is the founder and executive director of the Maryland-based Accessible Resources for Independence (ARI), a 501(c)(3) organization that supports the disability community and, through a federal grant, also serves as a Center for Independent Living for both Anne Arundel County and Howard County. In 1985, Martin was involved in an automobile collision that left him a functional quadriplegic and a new member of the disability community. He also serves as chairman of the Citizen Corps Council for Anne Arundel County and the City of Annapolis, as a member of the Anne Arundel Community Emergency Response Team (CERT), as an instructor for the "Functional Needs" module of the CERT training program, and as an adjunct teacher at Anne Arundel Community College. He graduated in 1999 from the Architecture School of Mississippi State University with a bachelor's degree in architecture, and worked for Levin Brown Architects from 2000 to 2009.

Rapid Dispatching Reduces Call-Processing Times

By Michael E. Cox Jr., State Homeland News

As in many other jurisdictions across the United States, the residents of Anne Arundel County, Maryland, who call 911 expect and usually receive prompt and efficient emergency services. In recent years, though, the dispatch procedures in many of the county's 911 call centers have become increasingly cumbersome. New programs and processes were instituted to identify the specific type of medical problem(s) to ensure that 911 operators dispatch the appropriate equipment and personnel to the scene of an incident and provide lifesaving care as quickly as possible.

Unfortunately, achievement of that goal has led to a new type of problem for medical calls in the emergency services community. According to the 2002 Edition of NFPA 1221 (Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems), "Ninety-five percent of emergency dispatching shall be completed within 60 seconds."

However, by the time the 2013 edition of NFPA 1221 was published, that standard had lengthened to 90 seconds for approximately 90 percent of incidents, and 120 seconds for 99 percent of incidents (in jurisdictions in which some type of emergency medical dispatch program is employed). Because time is always of the essence during almost any emergency, medical or otherwise, patients and other medical "customers" expect and require "due diligence" from the response process.

Finding a Cost-Effective Solution

Anne Arundel County is a diverse community with a population of more than 522,000 people and encompasses a land area of not quite 420 square miles – most of it in the Baltimore/Washington corridor, and bordered on its eastern side by the Chesapeake Bay. The Anne Arundel County Fire Department (AAFD) is an all-hazards response agency that includes 31 fire stations, aided by four support facilities. The department carries out a broad range of missions including, but not limited to: emergency medical responses; fire suppression and technical rescue responses; fire inspections and investigations; and a broad range of other duties, including public education, special operations, emergency dispatch communications, training, and emergency management. The department also has an FY 2014 operating budget of $109 million. Its staff – composed of more than approximately 770 career professionals, augmented by about 550 volunteers – responded last year to more than 77,000 calls for assistance.

Shortly after taking office, County Executive Laura Neuman, an entrepreneur and business leader in the information technology field, was briefed on the dispatch process and reemphasized her own personal and professional opinion that the department's efforts should focus on the best possible services being delivered to county residents, in as timely a manner as possible. She also directed that the AAFD immediately improve its dispatch process, but in a cost-effective way.

To meet those objectives, the fire department's senior officials established a new working group of professionals possessing varying degrees of experience in the Fire Department Communications Center. The primary goal of that working group was to find an innovative but, at the same time, fiscally prudent solution to solve many problems caused by the gradually increasing delays in dispatching emergency personnel.

Three Main Objectives, a Beta-Code Breakthrough & Stunning Success

The first three objectives of the new AAFD working group were to:

1. Develop strategies that would: (a) decrease call-processing times; (b) provide scripted 911 instructions that meet all national and state standards; (c) shorten the arrival time of medical providers; and (d) effectively manage departmental resources;

2. Review all call-processing and response data to and from the department, as well as from other emergency response agencies around the region and across the nation; and

3. Learn from and apply innovations from the call-processing workflows available from fire dispatch centers nationwide.

After meeting these first three objectives, the group identified and developed a generic new "beta-code" process – i.e., a generic text code entered into the Computer Aided Dispatch System that provides a selected response based on the complaint received from a caller – that would work effectively and compatibly in conjunction with an established computer-aided dispatch system.

Building on the plans spelled out by the working group, a new group – composed primarily of operators in the Communications Center – began testing the beta-code process and achieved major successes. After programming and piloting the new "Rapid Dispatch Protocol" (RDP) for 30 days, a cross section of trained operators recorded some truly stunning results; analysis of the preliminary data suggested a major reduction in call-processing times, with some calls being dispatched in as little as 15 seconds. Precisely how the time saved translates into *lives* saved is impossible to quantify, but saving even one life justifies the efforts expended.

The New Rapid Dispatch Protocol

Under the previous emergency medical dispatch system, before dispatching a responder unit, a call taker typically would ask a series of predetermined questions until he or she could decide what type and/or "quantity" of medical resources would be required. Under the new RDP system, which builds on the older system (but with a computer-code modification), call takers now: confirm the address, phone number, and nature of the call; then immediately dispatch the closest unit(s) available to respond.

Even as they notify the responder units, though, the dispatchers remain on the line with the caller to obtain additional information and immediately provide more precise pre-arrival instructions to the responder unit(s). If the information transmitted back and forth reveals that the incident requires additional resources and/or specialized equipment, the dispatcher can immediately order those resources to the scene as well. Most importantly, perhaps, is the fact that there is now no delay in dispatching emergency apparatuses while the call takers are obtaining additional information from callers.

This initiative has been a significant internal undertaking by the AAFD. More important, though, is that this solution has helped provide better services to citizens throughout the county; and it shows the commitment and ingenuity of the county's fire department personnel. Faster call-processing times translate directly into the delivery of emergency care in a more effective and timely manner. From the perspective of the average county resident, perhaps the best aspect of the new protocol is that an acceptable solution to a literal life-or-death problem was developed and implemented at almost no additional cost to local taxpayers!

Michael E. Cox Jr. is a 25-year veteran of the Anne Arundel County Fire Department and currently serves as the chief of the Department. He holds an associate's degree in EMS from Anne Arundel Community College, a bachelor's degree in fire science from the University of Maryland, and a master's degree in Executive Fire Service Leadership from Grand Canyon University. A nationally registered emergency medical technician paramedic, he is also a state-certified emergency services instructor and a graduate of the National Fire Academy's Executive Fire Officer Program. The national Center for Public Safety Excellence also has designated him as a chief fire officer. Chief Cox can be reached at: fdcox20@aacounty.org

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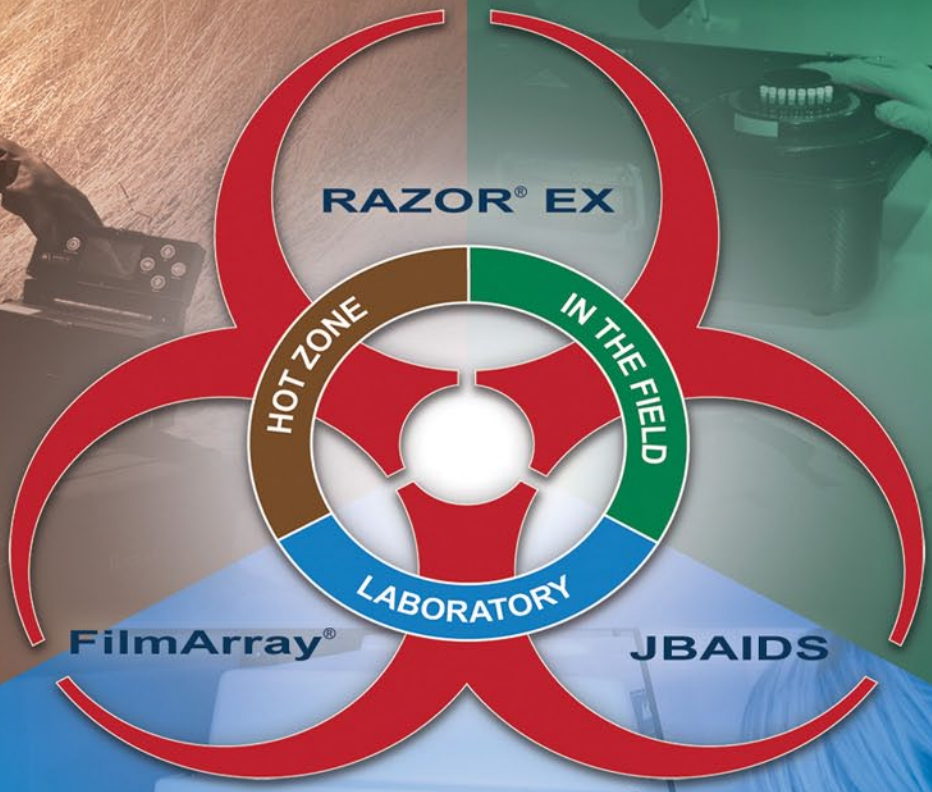

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Public Health Answers for Non-Public Health Organizations

By Charles (Chas) Eby, Public Health

Private companies and public agencies conduct business as usual most days, but emergency planners at these organizations should be acutely aware not only of the company's vulnerabilities but also of any external threats to operations that might cause major problems. Cyber attacks, earthquakes, and/or a pandemic flu – to cite but three examples – could jeopardize the business infrastructure, physical facility, and workforce capacity.

To cope with these and other threats, contingency planners have been developing and exercising continuity of operations (COOP) and continuity of government (COG) plans for many years. The COOP programs reduce the overall risk associated with disasters and incidents that could quickly disrupt the business processes and essential functions of any organization.

Those essential functions usually are aligned with the primary goals and operations of each organization. Public health agencies typically espouse objectives that help improve the health status of local residents, a category that includes their own staff. Other types of organizations focus on core objectives related to their specific disciplines. However, there is an opportunity for these groups to include the primary objectives of public health preparedness planning within their COOP plans and everyday operations. By incorporating health preparedness tips, many organizations not only augment and upgrade their planning efforts, but also help ensure that the multidisciplinary response to a health emergency is comprehensive and effective.

Emerging Health Threats & Business Continuity

A number of currently active public health threats affirm the need to include health preparedness in contingency planning as well as normal operations. In 2012, for example, Saudi Arabia reported the first case of the Middle East Respiratory Syndrome Coronavirus (MERS-CoV), a new lethal strain of respiratory virus. There have been more than 100 confirmed cases of MERS-CoV in eight countries since the initial outbreak, and almost half of the victims in those confirmed cases have died. Although there have been no cases identified in the United States – and all cases, in fact, can be linked to the Arabian Peninsula – both international and U.S. public health agencies are seriously concerned about this virus. Three reasons for concern are: its novel structure; the high mortality rate already recorded; and the current lack of vaccines and medications needed to mitigate the virus.

Another recent threat is a new strain of the avian influenza A (H7N9) virus reported earlier this year in China – beginning in April 2013, when an outbreak of that virus caused at least 130 people to become ill. Many of those infected had come into direct contact with poultry, but recent studies have shown that there has been some human-to-human transmission as well. Most cases of H7N9 have caused severe illness, which also was the case with the MERS-CoV outbreak.

So far, fortunately, the number of infections caused by both of these novel viruses has declined in recent months. This does not, however, eliminate a continuing concern that either or both viruses could mutate into a widespread outbreak or pandemic at any time. If nothing else, the MERS-CoV and H7N9 outbreaks serve as much needed reminders that healthcare organizations and agencies throughout the world should continue to develop the action plans needed to mitigate the short- and long-range effects of infectious diseases. In other words, the time

for public health contingency planning is and always should be now, with the preparedness communities of all nations leading that long range and continuing effort.

A "Top 10" Preparedness List For Non-Public Health Organizations

Federal, state, and local health departments throughout the United States are already actively planning to cope with the still emerging MERS-CoV, H7N9, and other short- and long-range emerging public health threats. Many of these same agencies even include specific actions related to health preparedness in their COOP plans. In May 2013, to help guide those efforts, the U.S. Centers for Disease Control and Prevention (CDC) released a comprehensive report – the "Top 10 Influenza Pandemic Response Planning Tips for H7N9 Virus" – intended for a public health and healthcare audience. Also included in the report is an abundance of helpful information on such related topics as epidemiological surveillance, pandemic planning, laboratory testing, and mass vaccination programs.

The CDC's report also discusses several essential "preparedness areas" for health departments, but many of the items on that list are too specific for other disciplines. However, the following 10 recommendations for action could help strengthen COOP plans and operations spanning the entire national spectrum of private and public sector organizations long before a major health emergency does occur:

1. *Identify and assign an employee to serve as the organization's emergency preparedness and public health liaison.* Any employee so designated should establish contact with state and local health departments. A direct contact often proves to be invaluable for planning, particularly during an acute public health emergency.

2. *Regularly monitor the CDC's website and related surveillance information.* Federal health departments, and most of their state-level counterparts, provide an abundance of helpful information and guidelines on emerging diseases for employers, travelers, state and local health departments, and the nation's healthcare systems in general.

3. *Endorse a healthy lifestyle within local organizations and promote seasonal influenza vaccinations.* Numerous studies have demonstrated that employee vaccinations not only reduce absenteeism during flu season, but also may increase productivity. Additionally, employers can identify nearby health clinics, facilities, and pharmacies where staff may receive vaccinations and/or obtain medications on a regular basis as well as during health emergencies.

4. *Develop and implement a detailed plan for rapidly notifying employees when a health emergency is declared.* By working with local health departments, most organizations can script messages and recommendations ahead of time to quickly disseminate information to employees.

5. *Develop worker safety guidelines and recommend that individual staff members develop family preparedness plans.* Studies have shown that staff members are more likely to report to work during a public health incident if they believe that their families are safe and adequately prepared during an outbreak.

6. *Create telework and proactive sick leave policies that staff members can quickly implement during a disease outbreak.* Social distancing is a public health tactic that helps reduce the transmission of contagious diseases. Telework allows employees to perform many of their duties at home without facing the risk of contracting or spreading disease.

7. *Ensure that various health issues related to overtime employee compensation are properly vetted, discussed, and agreed upon before an emergency occurs.* Public health incidents can drastically reduce the size and effectiveness of any organization's work force – a major problem that, of course, imposes an extra burden on other employees and often requires them to work overtime. Resolving these and similar issues with an organization's human resources department would help ensure that overtime work is approved and performed as needed, and that all essential functions will continue without serious interruption.

8. *Ensure that multiple communications modalities are available to keep staff fully informed on a continuing basis.* Not all employees are likely to be onsite during or immediately after a widespread public health emergency develops. Coordinated communications planning and periodic testing would keep staff employees fully informed.

9. *Enact policies or procedures that facilitate the rapid procurement of any additional services and/or material resources needed*. Previous public health emergencies have demanded federal, state, and local interventions – as well as the dispersal of additional funds. Pre-drafted policies for receiving funds and/or other material resources to implement the programs can ease this process during an emergency.

10. *Update an agency COOP plan.* These plans spell out, in considerable detail, not only the organization's essential functions and processes but also the various ways to ensure satisfactory continuation of those functions and completion of processes during an unforeseen emergency.

The current threats to public health are a timely reminder that many dangerous diseases can rapidly evolve – and, by doing so, affect the local preparedness community and the private sector. All organizations potentially involved, therefore, should at least consider including the health preparedness tips and guidelines mentioned above in their contingency plans to augment their own COOP programs.

There would be a helpful consequence for such actions – namely, improved and effective working relationships between public health and non-public health organizations. For that reason alone, state and local health departments, emergency management agencies, and the U.S. national responder community as a whole should consider issuing these recommendations, and/or similar guidelines, to public and private organizations within their jurisdictions.

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Creating a Closed Point of Dispensing: A How-To Primer

By David Reddick, Private Sector

The federal government plans to make lifesaving medications available to communities as quickly as possible after a bioterrorism event has occurred. To meet that goal, the U.S. Department of Homeland Security (DHS) and the U.S. Centers for Disease Control and Prevention (CDC) have developed an innovative plan to warehouse the medications at secure locations. From there, the medical countermeasures (MCMs) can be quickly delivered to local public health departments; the CDC is responsible for distributing the medicine to residents within 48 hours of a declared disaster.

The distribution process is a major component of the CDC's Cities Readiness Initiative (CRI), a federally funded program designed to enhance preparedness in the nation's major metropolitan areas. The program currently includes 72 of the nation's largest communities (at least one in each state), and health departments in those communities are working on various stages of the more detailed plans needed to counter future bioterrorism attacks. Although the program is well designed and tested, there is still a weak link in the concept that must be resolved – namely, the logistics involved in physically distributing the medications to every man, woman, and child in all communities directly affected by a bioterrorism incident.

Open vs. Closed Distribution: Both Are Needed

Most local public health departments already have plans to use a system of open points of dispensing (open PODs) that will be established as needed at predetermined venues, such as schools or community centers. When a biological threat warrants the opening of PODs, public officials will direct residents to the open PODs to wait in line, along with their neighbors, for the medications needed.

However, the length of the wait itself can be extremely discouraging. A community that is home to one million residents, for example, may have plans to establish 15 to 20 open PODs, but that means that each POD would have to accommodate at least 50,000 residents. Not only is it a challenge to serve so many residents in a short time period, but the staffing requirements for that many open PODs exceeds the capabilities of most health departments.

One alternative to open PODs is a network of closed PODs, which typically is composed of organizations with discrete populations – colleges and universities, for example, plus businesses, private sector groups, and government agencies. Each member of the network agrees to accept and distribute the medications likely to be required and distribute them to their own populations. The advantage of such arrangements for the health departments at all levels of government is obvious: They essentially can outsource the distribution of hundreds of thousands of doses of various medications to the closed PODs, in order to focus their efforts on serving other citizens lacking access to the closed PODs.

The arithmetic also is easy to understand: More closed PODs means fewer people waiting for medications at open PODs in the same community. Using this approach might even enable a community to scale back the number of open PODs it activates, and that in itself would make the local staffing challenge more manageable.

The Advantages to Employers

Employers of many corporations and other high-population institutions and organizations have various reasons to establish closed PODs: (a) It costs them little or nothing to establish a closed POD since there are no fees involved in participation; (b) The medications provided to the host organization also are free since they have already been purchased and maintained by the federal government; and (c) The lifesaving medications are delivered to the organization's employees quickly and economically.

In return, the businesses, organizations, and other hosts of the closed PODs are required to design and exercise the plans needed to distribute MCMs to their employees. Most jurisdictions also allow employees to collect the medications for themselves and members of their immediate families, so that dependents do not need to travel to the place of business. Thanks to the built-in

flexibility of this approach, even the health departments in non-CRI communities are able to establish and staff closed PODs for their own employees.

Moreover, the duties assigned are not too onerous. The requirements for establishing a closed POD vary from one community to another, of course, but the first step required usually is to contact the local public health department to speak with the public health emergency planner, the SNS (Strategic National Stockpile) coordinator, and/or the CRI coordinator. Even if a community is not included in the CRI program, the local health department may still welcome an offer to establish and staff a closed POD.

Other possible workplace requirements might include agreements that: (a) the closed POD must be able to serve a certain minimum number of people; and (b) that the host organizations must demonstrate their ability to establish and occasionally exercise their distribution plans for the MCMs. Although state laws may vary on who can physically distribute medications, each health department should at least be able to explain its own state rules and then help a potential host meet those regulations. In Missouri, for example, a certified medical professional must oversee every closed POD, and those physically handing medications to recipients either must be certified professionals or have completed a state-provided training class. In contrast, two of the nation's largest states, Texas and New York, allow almost anyone reasonably qualified to dispense medications after the state declares a bioterrorism disaster.

Six Keys to Success

Most local public health departments already have at least a draft memorandum of understanding (MOU) in place that explains exactly what the expected roles are of both the department and the closed POD. The following steps provide a general outline of what an agency or organization must do to become a closed POD – but the local requirements for each community might vary slightly:

1. Contact the local public health department and speak with the person in charge of emergency planning, and/or CRI compliance, to find out what the organization must do to serve as a closed POD. The same person will probably be able to provide the specific steps necessary for that jurisdiction.

2. Obtain a copy of the MOU and forward it to the appropriate legal counsel in the requesting company or organization. (Note: In general, health departments are reluctant to alter the language of the MOU because similar MOUs are being signed by other closed POD hosts, but specific language an organization finds objectionable should be discussed with the health department.)

3. Create a closed-POD team, the membership of which should include representatives of the organization's legal, business continuity, human resources, and communications staff. The team members must obtain executive approval for their efforts, and usually will be responsible for designing the organization's plan, including the site layout and periodic exercises required.

4. After the organization has approved the MOU, the leaders of the organization must sign it and provide a copy to the local health department.

5. Provide the health department with all of the information needed to reserve the appropriate number of lifesaving medications, which would either be delivered to the POD site or made available for pickup.

6. Be ready at all times, even on very short notice, to activate the closed POD when a local incident occurs.

To help address concerns about the legal liabilities involved in operating a closed POD, the Public Readiness and Emergency Preparedness (PREP) Act clearly states that, as long as there is no "willful misconduct" on the part of an organization, it will be immune from liability in its delivery of medical countermeasures.

The creation and staffing of a closed POD will enable both medium-sized and larger organizations to effectively help prepare their communities for a bioterrorism attack, while at the same time protecting their most valuable assets: their employees. With a relatively modest and low-cost effort on the part of these organizations, closed PODs offer many benefits to the employees, the local health systems, and the surrounding communities.

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