

Health Systems And Surge Capacity



Hospital Surge Capacity - A Moving Target

By Theodore (Ted) Tully, Health Systems

Hospital Expansion Through Alternate Care Sites

By Joseph Cahill, EMS

Meeting the Challenge Public Health Emergencies & The Special Needs Populations

By Bruce Clements, Public Health

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Prepared by Craig Vanderwagen, Former HHS
Assistant Secretary for Preparedness &
Response; Summarized by John F. Morton, DP40

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Editor's Notes

By James D. Hessman, Editor in Chief



Health Care Systems and Disaster Plans – their requirements and limitations, specifically including the lack of space to deal with mass-casualty incidents and events – are the principal and extremely multifaceted subjects covered in this month's printable issue, which also includes exclusive insider reports on topics ranging from such macro events as the 2009 presidential inauguration and a projected \$1 trillion expenditure on critical infrastructure to the need for greater access to medical records to hospital surge capacities to a post-Katrina tabletop exercise in Louisiana to a number of important "lessons learned" from the 2003 SARS outbreak in Canada.

Also in this issue are a detailed summary report, prepared by Dr. Craig Vanderwagen and summarized by John Morton, of the latest DomPrep 40 Survey (on healthcare infrastructure needs and limitations) and four "States of Preparedness" articles by Adam McLaughlin on: (a) New York City's well timed decision (prior to the fumbled Times Square bombing attempt, it should be noted) to carry out random luggage searches at the city's subway stations; (b) A major National Guard training exercise – with considerable state and local involvement – in Alaska, not only the nation's largest and northernmost state but also, perhaps, the most vulnerable to earthquakes; (c) California's meticulously planned, and exceptionally complicated, UASI (Urban Areas Security Initiatives) exercise testing the overlapping response capabilities of the three major cities (and more than 100 smaller communities) within the high-risk Bay Area; and (d) Alabama's annual lane-reversal "practice run" for the 2010 hurricane season.

Theodore (Ted) Tully leads off the interrelated health care articles with a report on the difficult financial situation of most if not quite all U.S. hospitals, and points out how current funding problems are compounded by such mass-casualty events as the 9/11 terrorist attack on the World Trade Center Towers. He also notes, not incidentally, that St. Vincent's Hospital Center in New York City, where most of the injured 9/11 survivors were taken, recently had to close its doors because of financial reasons.

Joseph Cahill continues the march on a more hopeful note with several recommendations on the use of alternate-care sites – pointing out, though, that considerable advance planning is needed, and all of the stakeholders must be involved at every step of the way Bruce Clements adds a truly "special" report on the frequently forgotten communities – the nation's MSN (medical special needs) patients (those suffering from permanent disabilities, the mentally challenged, and those whose therapy requires special (and often very expensive) medical equipment or treatment, including dialysis).

Other contributors include: Pamela Spring and Rainier C. Harvey Sr., who report on the mass-sheltering and/or evacuation plans developed for last year's presidential inauguration week; Raphael Barishansky, who discusses several other overlooked details (acute events vs. chronic events, for example); Rodrigo (Roddy) Moscoso, who analyzes the need for much faster transmission of medical records from one health care facility to another (a problem immensely complicated, of course, by essential security requirements); and Dennis Schrader, who focuses special attention on the economic and operational gains available by fusing microeconomic design decisions into the macroeconomic blueprint of building a new national medical infrastructure. JL Smither wraps up the issue with another valuable lessons-learned report – this time around, the previously mentioned tabletop exercise in Louisiana and the 2003 SARS outbreak in Canada.

About the Cover: Another imaginative Susan Collins combination - two from iStock (image of symmetrically arranged syringes on a circle, isolated in white; and a medical symbol made out of concrete, with one snake on a health cross); and a FEMA (Federal Emergency Management Agency) photo, by Ed Edahl, showing Louisiana refugees, who had to flee their homes after Hurricane Katrina hit New Orleans, inside the Houston Astrodome, which served as a temporary shelter for thousands of their Louisiana neighbors.

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Hospital Surge Capacity – A Moving Target

By Theodore (Ted) Tully, Health Systems



“Surge” is a term used in health care to describe everything from an unexpected increase in Emergency Department (ED) volume on a Monday morning to a bus accident that activates a hospital’s disaster plan. The definition of surge is particularly important for emergency planners because activation of a HICS (Hospital Incident Command System) plan for a surge event creates challenges beyond those related to the space available and the staff needed.

Throughout the United States, hospitals are facing difficult financial decisions, many of which have led to hospital closures and/or reductions in bed capacity. Hospital closures in some areas can actually cause surges in other hospitals within the surrounding area, where ambulances and walk-in patients create new health care patterns. One result is that EDs in that area are forced to plan for a patient volume greater than that for which they were originally designed.

A recent example of such surge situations occurred in New York City when St. Vincent’s Medical Center in lower Manhattan was forced to close (for financial reasons). As the designated trauma center for the lower Manhattan area, the center’s annual ED volume was close to 70,000 emergency visits per year. As a result of its closing, many decisions had to be made by different groups of people: ambulance crews and individual members of the community have had to choose the next closest and/or most appropriate hospital to deal with their medical emergencies; to accommodate the additional surges in their centers, the other hospitals in the area have had to change at least some of the ways in which they provide health care; and the community as a whole needs a new plan for reacting to a major disaster in the area. (Here it is relevant to note that the Saint Vincent’s center was the main hospital receiving victims from the World Trade Center on 11 September 2001.)

Most hospital emergency operations plans (EOPs) include built-in triggers for activation during periods of unanticipated patient surge. If the surge causes an increase of 10-20 percent more patients presenting themselves to its emergency room, the trigger will usually get pulled and the hospital affected will open its emergency operations center and activate its HICS plan. When this sudden change comes about as a result of the hospital down the street closing its doors, it is viewed rather differently by a hospital’s administration than the bus accident that qualifies as a multiple-casualty incident (MCI).

Pre-Planning: The Key to a Workable Solution

In the latter case, the surge caused by any unplanned increase in patient volume will affect the institution in much the same way – the increased number of patients will eventually overwhelm the staff, the space available, and the supply capacity of that hospital. These and other immediate problems will require the staff – including the hospital’s administration – to react in an emergency mode in order to ensure there

is adequate and timely health care for as many patients as possible. Seasonal flu and situational issues such as the presence of waterborne gastrointestinal viruses can cause similarly unforeseeable patient surges.

The latest large-scale example of stressed hospital systems was this season's H1N1 virus, which caused some hospitals to experience ED patient surges ranging from 50 percent to 100 percent above normal volumes. To compound the difficulty, this surge was the result of a potentially infectious disease, which means that hospital staff not only had to react to the increased number of extra patients, but had to do it in a way to protect those not already infected. That combination created a challenging situation within the confines of extremely crowded EDs.

The ability of a hospital to adapt to this type of surge affects not only its ED but also its ambulatory areas, isolation rooms, and inpatient census. All of these interrelated problems, it should be noted, were in response to a patient surge that in retrospect – particularly considering that it was officially designated by the World Health Organization as a global pandemic – can only be described as minor.

POD Plans, Electrical Outlets And the “Doubling Up” Option

For almost a decade, U.S. hospitals have been required – through federal grant deliverables – to develop plans for hospital surge situations. Some states and regions do have elaborate plans in place to shelter people and ensure that pharmaceuticals are available to the public (usually through the use of a point-of-distribution, or POD, process). But few of those plans truly address the complications involved in establishing, and managing, medically comprehensive alternate care sites outside of the hospitals' current geographic settings.

The planning, within a hospital, for an alternate-care facility in the same complex is in some ways easier to

envison, of course. However, given the current financial status of most U.S. hospitals, the establishment of such same-site facilities also has been a major challenge.

With so many U.S. hospitals experiencing a surge caused by one or more of the factors previously mentioned – e.g., hospital closures, seasonal flu, the increased use of hospital EDs for primary care – hospital administrators and their strategic planning staff would be well advised to view the development of surge plans as a continuing, and very important, requirement for the foreseeable future.

Hospital closures in some areas can actually cause surges in other hospitals where ambulances and walk-in patients create new health care patterns; one result is that EDs are forced to plan for a patient volume greater than that for which they were originally designed

Following are some of the guidelines that might be followed: (a) The use of expandable EDs and the planning of conference space should be considered during the planning process. (b) Hospital rooms could be doubled during surge events by expanding private rooms and designing them with dual medical gas systems. (c) The space provided for planning conferences could also be used for patient care (when equipped with extra electrical outlets, emergency power, and the ability to make space negative pressure).

There are numerous other possibilities that might also be considered. Whatever decisions are made, though, it is important for planners to keep in mind that the “solutions” agreed upon would be necessary not only in the event of an obvious MCI/disaster, but also when a neighboring health care institution just down the street is forced – for financial, political, or other reasons – to close its doors on a permanent basis.

Theodore “Ted” Tully is the Administrative Director for Emergency Preparedness at Mount Sinai Medical Center in New York City. He previously served as Vice President for Emergency Services at the Westchester Medical Center (WMC), as Westchester County EMS (emergency medical services) Coordinator, and as a police paramedic/detective in Greenburgh, N.Y. He also helped create the WMC Regional Resource Center, which is responsible for coordinating the emergency plans of 32 hospitals in lower New York State.

Hospital Expansion Through Alternate Care Sites

By Joseph Cahill, EMS



Most U.S. hospitals are designed to service a specific load of patients, with the number varying more or less in accordance with the population in the area and the prevalence of various diseases within that population. During a crisis situation, these resources can be stretched, but only within a certain limit. One of the most important healthcare goals in recent years, therefore, has been to plan for the expansion of hospital care beyond the physical walls of a specific hospital.

To meet that goal, many hospitals and communities have developed plans to use tent-based hospitals on the hospital campus. There is an innate efficiency in this plan, because the resources needed by tent-based hospitals can be distributed through and buttressed by the supply system of the hospital – and other resources can easily be shared between the two as well. However, resources that cannot be expanded – e.g., parking areas and road access – may become strained.

Other hospitals have favored the use of off-site facilities, including existing non-hospital structures. These Alternate Care Sites (ACSs) usually possess some unique advantages of their own – for example, they do not bring additional traffic to the main hospital. However, an ACS is not intended to be a full-service hospital but, rather, a separate medical facility equipped to care for less critically ill patients. For example, in cases of respiratory diseases such as influenza, an ACS can be used for patients who are too sick to stay home but, on the other hand, do not really have to be assigned to an intensive care unit. Ideally, a relatively large surge of patients with similar low-intensity needs can be monitored by a small cadre of staff at such an off-site facility.

Planning, Stockpiling, And Other Distinctions

Although they share some common elements, an ACS should not be confused with a “points of distribution/vaccination” (POD/V) site – which is intended solely for the one-time distribution of medications to and/or vaccination of the general

population. An ACS is specifically designed, and intended, to handle a surge of patients who would be admitted to the facility even during a non-surge situation and remain there until they are well enough to be discharged.

Planning for the design and use of an ACS requires more than: (a) stockpiling medical equipment, medicines, and other healthcare materials; and (b) locating a suitable facility. Planners should use the legal assets of the hospital during the planning process – if only because, for the ACS to function as a hospital,

it may have to be licensed under the state and local laws governing healthcare facilities. Meeting this requirement probably will involve working in close cooperation with state healthcare quality regulators.

This may seem like a “minor detail” in the face of an imminent disaster (or one that has already occurred), but it obviously should be considered during the planning phase rather than during an actual crisis situation. Just as obviously, effective emergency planning will, or should, account for all such reasonably foreseeable issues so that, when disaster does strike, emergency personnel can devote their undivided attention to whatever unforeseen issues arise.

Although possessing a reasonable degree of surge capacity has been important enough for state and federal program committees to

devote considerable time and energy to the planning efforts per se, putting those plans into effect will almost always be a costly process. Here, an important point to keep in mind is that a stay at an unlicensed ACS would probably not be “billable” under most health care plans. Following any disaster, there will come a time, though, sooner or later, when costs will have to be paid and previously unanswered questions can no longer be kept in the “hold” basket.

The resources needed by tent-based hospitals can be distributed through and buttressed by the supply system of the hospital – and other resources can easily be shared between the two as well; however, resources that cannot be expanded – e.g., parking areas and road access – may become strained

Joseph Cahill, a medicolegal investigator for the Massachusetts Office of the Chief Medical Examiner, previously served as exercise and training coordinator for the Massachusetts Department of Public Health, and prior to that was an emergency planner in the Westchester County (N.Y.) Office of Emergency Management. He also served for five years as the citywide advanced life support (ALS) coordinator for the FDNY - Bureau of EMS, and prior to that was the department's Division 6 ALS coordinator, covering the South Bronx and Harlem.

Meeting the Challenge

Public Health Emergencies & the Special Needs Populations

By Bruce Clements, Public Health



The array of challenges posed by medical special needs (MSN) populations is among the many lessons highlighted during the 2005 response to Hurricane Katrina. However, even defining the demographics of MSN populations can be a difficult task, partly because the MSN population is only one component of the more broadly defined “vulnerable populations” – a term that includes those with socio-economic, language, and/or cultural barriers that hamper their ability to react in accordance with the instructions provided to the general population.

MSN populations include those with physical disabilities, other debilitating health conditions, and mental health issues. They require special attention in order to ensure safety and sustainment of their care throughout each phase of an emergency. However, because the range of functions within these populations is so diverse, specifically defining an MSN population and determining its unique needs can be an extremely difficult if not impossible task, making MSN planning and response among the most challenging issues facing medical responders both before and during public health emergencies.

Although many members of the MSN populations may not require hospitalization, they often are suffering from conditions that exceed the capabilities of the general population shelters managed by the American Red Cross. The ambiguous nature of an MSN population definition is further complicated by the growing number of Americans with varying degrees of disabilities, including those with multiple disabilities.

Some Plans Already in Place – But Additional Work Needed

Advance planning at the local level is the key to the successful management of MSN populations during a crisis. Although some at-risk hospitals already have comprehensive evacuation plans supposedly in place, many – probably most – of those plans still need additional work. The Joint Commission has continued to increase emergency preparedness requirements for health care facilities – to prepare workable evacuation plans, for example. However, many of those

facilities apparently are still counting on a “sheltering in place” strategy, regardless of circumstances.

Long-term care facilities – e.g., nursing homes – also have developed evacuation plans, but many of these plans do not go beyond the confines of the facility’s own parking lot. Measures to facilitate evacuation outside of the immediate area are often lacking because many plans are limited to a facility’s fire-evacuation procedures.

The National Disaster Medical System (NDMS) possesses some resources that can be used in the evacuation of special needs populations; however, the NDMS option should be used only as a last resort – for two reasons: (a) The use of NDMS assets requires a presidential disaster declaration; and (b) The military aircraft used for NDMS air evacuations can prove to be a harsh environment for MSN evacuees. It is therefore very important that local responders and planners understand NDMS’s roles and limitations.

The NDMS Disaster Medical Assistance Teams (DMATs) at air hubs have limited patient care capacity. DMAT Strike Teams may be deployed, though, with a mission to provide workforce protection for only the staff assigned to the air hub itself, and therefore would have no patient care mission. Given the overall environment of care available at air hubs, the NDMS evacuation of MSN populations should focus specifically on low-acuity MSN evacuees. Higher-acuity patients should be evacuated, therefore, either by ground transportation or, in some rare occasions, by smaller fixed-wing aircraft – not only to provide a more stable transport environment but also to reduce the resource burden imposed on the NDMS system by high-acuity patients.

The Three Groups Most Seriously Endangered

In addition to the patients already in health care facilities, there are three primary MSN groups that require special consideration during a disaster – those who are: (a) medically fragile; and/or (b) technologically dependent; and/or (c) members of high-risk groups. The medically fragile population includes patients living outside health care institutions who require some level of care from a provider

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such as a home health nurse. Some patients in this category, of course, may be suffering from one or more chronic conditions, and/or require regular monitoring, or both – but others may simply need assistance with the usual activities of daily living.

Those who are technologically dependent include patients who depend on power for mechanical devices, or oxygen to sustain life and/or enable regular activities of daily living – e.g., those on ventilators, dialysis machines, or other devices used to sustain their normal everyday health. During large-scale disasters, the provision of oxygen is a particularly difficult challenge – which is complicated, moreover, by the requirement of oxygen vendors to refill only their own tanks and not those of other vendors. (Unfortunately, this restriction may preclude planning for a blanket contract with a vendor to provide oxygen over a wide area.)

High-risk populations include those who are typically able to “thrive and survive” in normal circumstances, but during a major disaster may require additional support. This includes individuals recently released from a hospital setting – e.g., post-surgical patients, people requiring life-sustaining medications and/or home IV therapy, and pregnant women as well as newborns.

Probably the best way for emergency planners to identify the individual members of MSN groups is by contacting local disability organizations, which can provide details on where various groups of high-risk or disabled individuals may work or live. An MSN registry may also be a valuable preparedness tool in pre-identifying the medically fragile, technologically dependent, or high-risk groups.

Gradual & Continuing Improvement; Again, Additional Work Needed

Fortunately, MSN shelters have evolved, and improved, significantly since the 2005 response to Hurricane Katrina. Lessons learned in recent years have shaped the role and function of MSN shelters. The planning and responsibility

often falls on local and state public health agencies, many of which have risen to the challenge. For example, Florida, Texas, and many other states have developed detailed plans and guidelines for MSN shelter operations.

It is important that MSN shelter facilities be identified in advance because the MSN populations usually require more space per person than is available in a general population shelter. The latter are typically based on 40 square feet per bed/cot, but MSN shelters usually require twice as much space – i.e., 80 square feet per bed/cot. The additional space is needed for medical stations, medical administrative areas, and patient isolation areas.

Because the range of functions is so diverse, specifically defining an MSN population and determining its unique needs can be an extremely difficult if not impossible task, making MSN planning and response among the most challenging issues facing medical responders during public health emergencies

As previously mentioned, there is a broad spectrum of MSN populations, so it is important to establish sheltering categories. “Cohorting” those who simply need evacuation assistance with those who require intensive 24-hour medical support is a mistake. A clear delineation must be made, therefore, between those in need of medical care and those who can be supported in a shelter environment designed for the general population.

Staffing levels for each MSN shelter are, or should be, established on a case-by-case basis depending on the size and medical needs of the population being sheltered. It is therefore important to maintain situational awareness when a community receives evacuees for sheltering. This is usually, and most easily, accomplished by establishing reception locations for

all evacuees. As the individual evacuees register, referrals/ assignments can be made to the appropriate shelter location – and the equipment and supplies needed to support them also can be assured.

The Most Difficult Challenges: Communications, and Dialysis Needs

During a major public health emergency, communications is almost invariably the key to success, and communications with the MSN audience must be given special consideration in developing a general communications strategy. However,

according to a 2005 National Organization on Disability Harris Poll Survey, only 16 percent of emergency preparedness awareness campaigns directed at people with disabilities are in accessible formats. In addition to mass media outreach, the Emergency Alert System, reverse 911, and registration of MSN cell phones may prove to be effective solutions – at least in part. Nonetheless, the MSN demographics within each community and a planning framework that will facilitate the communications needed must be defined much more precisely.

Another difficult MSN challenge involves the need for effective and continuing pharmacy support. Evacuees should of course be encouraged to bring their pill bottles with them; by the same token, though, commercial pharmacy vendors should be invited, *during the planning process*, to help establish the approaches needed for refilling critical prescriptions in the event that members of the various MSN populations are displaced.

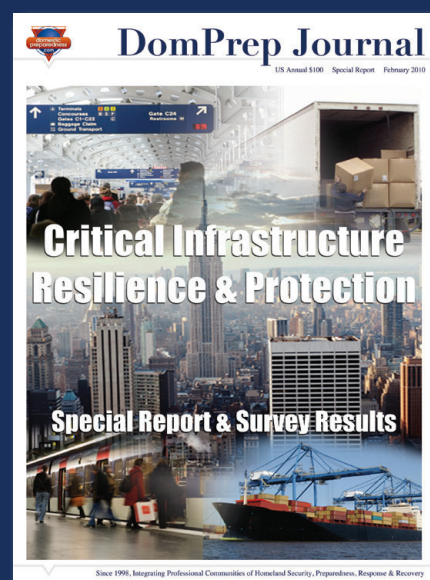
There also must be a plan that takes the special needs of dialysis patients into account, particularly the availability of dialysis services within close proximity. There have been incidents in recent disasters in which dialysis services were

“offered” to the patient but, because of the travel distance required, had to be refused. Ensuring the availability of dialysis services will continue to be a challenge during and after major evacuations. If a dialysis center has been “hardened” to withstand a certain amount of damage, its continued availability may discourage some patients from following an evacuation order. On the other hand, if dialysis centers are closed throughout a relatively large geographic area, the only option left may be transporting MSN patients considerable distances to meet their special needs.

For both the pharmaceutical and dialysis issues, the private sector providers are the greatest allies of preparedness and response. They simply need to be engaged more closely in the preparedness process by local and state officials as well as their own stakeholders.

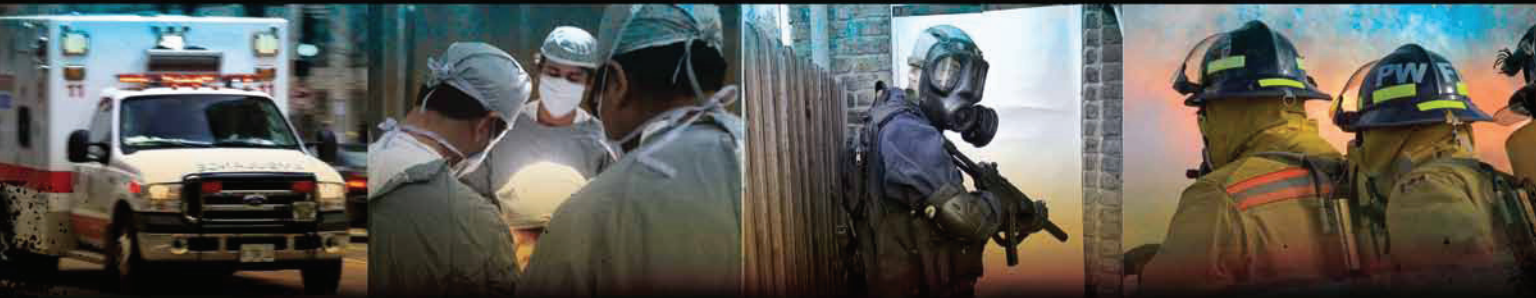
Bruce Clements is the Public Health Preparedness Director for the Texas Department of State Health Services in Austin, Texas, and in that post is responsible for health and medical preparedness and response programs ranging from pandemic influenza to the health impact of hurricanes. A well known speaker and writer, Clements also serves as adjunct faculty at the Saint Louis University Institute for BioSecurity. His most recent book, Disasters and Public Health: Planning and Response, was released in 2009.

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DomPrep Survey

Your Thoughts Compared with DomPrep40's National Experts on...Health Systems & Surge

Prepared by Craig Vanderwagen, Former HHS Assistant Secretary Preparedness & Response; Summarized by John F. Morton, DP40



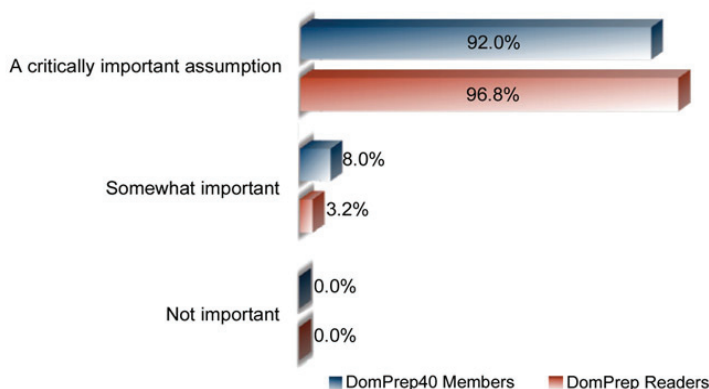
This DomPrep survey focused on mass-casualty preparedness and response in general and responses to a nuclear event in particular. Although many believe that a mass-casualty event caused by a nuclear detonation is highly unlikely, evidence from the intelligence community suggests a high probability of occurrence within the next 3-5 years. This information may have been a key factor in the Obama administration's re-evaluation of the U.S. Government's (USG's) policies in the field of weapons. President Obama has not only recently announced the signing of the Strategic Arms Reduction Treaty document but also released a statement of re-focused USG policy on nuclear threats that highlighted the need to focus on non-state actors and their apparent intent to create a catastrophic event using a nuclear detonation. That threat, of course, has major implications for the U.S. security community and its mission to prevent such an event. It also raises questions about the nation's domestic ability to respond.

Dr. Craig Vanderwagen, former assistant health and human services secretary for preparedness and response (ASPR), who prepared the survey, has pointed out that the current response "environment" may be "more focused on other causes of mass casualties – large earthquakes, chemical exposures, or a bio-event involving a large population and such – but the dynamics of managing a large number of individuals needing medical care and public health interventions apply directly to nuclear detonation." The nation's human and physical assets would be tested severely by such large-scale events, and the planning requirements are therefore multi-sectoral – even though the focus will continue to be on saving lives and reducing the additional burden of disease. Also not to be underemphasized are the nation's ability to recover from such an event and the resiliency of the American people, and institutions, in swiftly ameliorating the impact of the event on everyday functioning.

Key Findings

DomPrep readers and members of the DomPrep40 are generally doubtful over the nation's ability to manage the consequences of a mass-casualty event. A solid plurality view regional planning as the crux of a solution.

In planning for a mass-casualty event, being prepared to manage the event without federal support for the first 48 hours is



The DomPrep40

The DomPrep40 is an interactive advisory board of insider practitioners and opinion leaders who have been asked to offer advice and recommendations on pertinent issues of the day. Focusing primarily on all-hazard preparedness as well as response and recovery operations, they will be challenged to provide quantifiable feedback that will be shared with the DomPrep audience.

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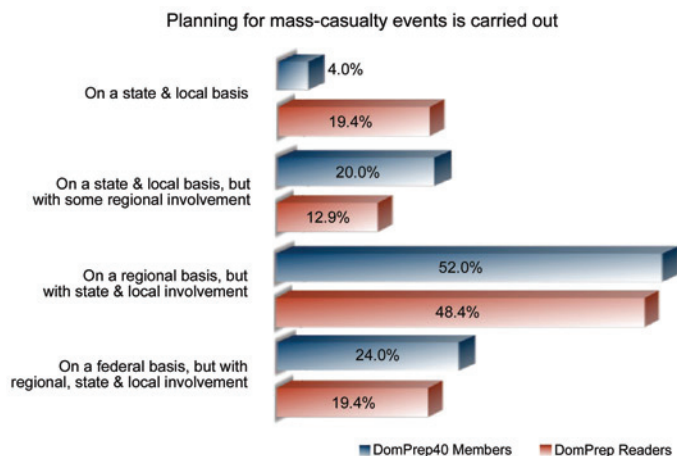
Former Director, Engineering & Emergency Services, Maryland Department of Transportation

Craig DeAtley

Director for Institute for Public Health Emergency Readiness

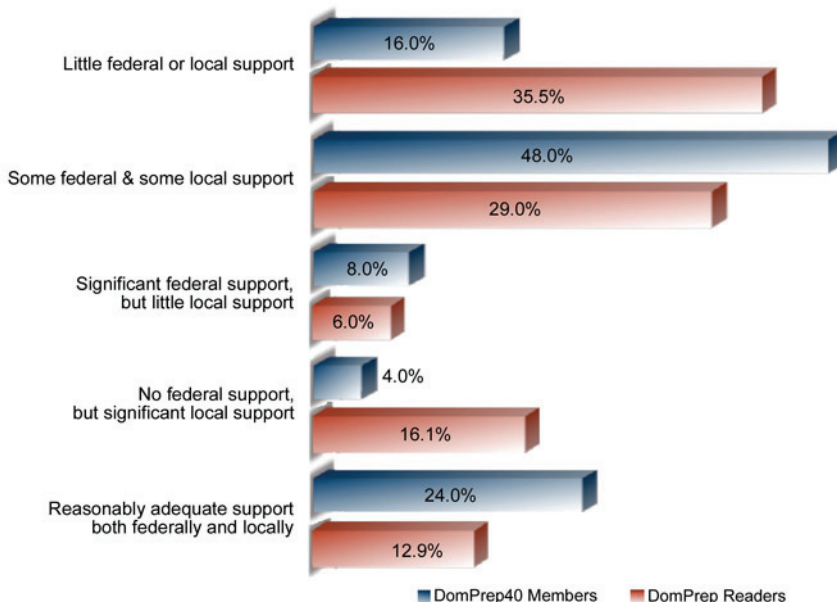
DomPrep readers overwhelmingly agreed with the DP40 that a critically important assumption in mass-casualty planning is the need to be prepared to manage the event, without federal support, for the first 48 hours.

Readers and DP40 members similarly agreed (at 50 percent) that management of a mass-casualty response requires both a regional effort and regional planning – with state and local involvement. About 20 percent of both groups also believe that planning should be managed primarily at the federal level – supported, though, with regional, state, and local involvement.



As regards the application of resources toward the development of plans for mass-casualty events, readers were less optimistic than the DP40 were. About 30 percent saw some federal and some local support in order to carry out regional planning; only 6.5 percent, though, indicated there is sufficient federal support (but little local support) for regional planning – and only 12.9 percent said both federal and local support are adequate.

In developing regional plans to cope with mass-casualty events, with regards to resource commitments (time, money, people) the following approach best characterizes our situation



DomPrep40 Members

Nancy Dragani

Former President, National Emergency Management Agency (NEMA), Executive Director, Ohio Emergency Management Agency

Warren Edwards

Major General USA (Ret.), Director, Community & Regional Resilience Institute (CARRI)

Katherine Fuchs

Deputy Chief FDNY Emergency Medical Services Command

Ellen Gordon

Member, Homeland Security Advisory Council and Naval Postgraduate School Center for Homeland Defense Security

Kay Goss

Former Associate Director, National Preparedness Training & Exercises, FEMA

Steven Grainer

Chief, IMS Programs, Virginia Department of Fire Programs

Jack Herrmann

Senior Advisor, Public Health Preparedness, NACCHO

Cathlene Hockett

Continuity of Government Planning Director, State of Minnesota

James Hull

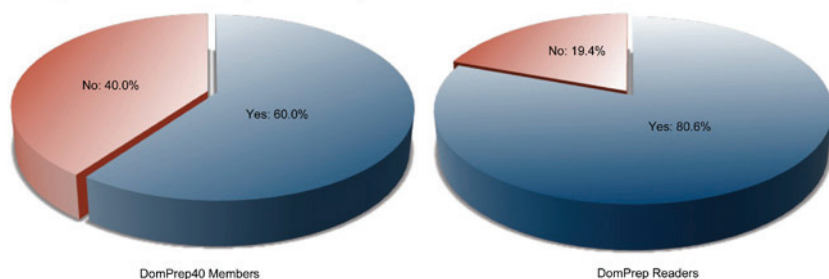
Vice Admiral USCG (Ret.), former Commander, Atlantic Area

Harvey Johnson, Jr.

Vice Admiral USCG (Ret.), former Deputy Administrator & Chief Operating Officer, FEMA

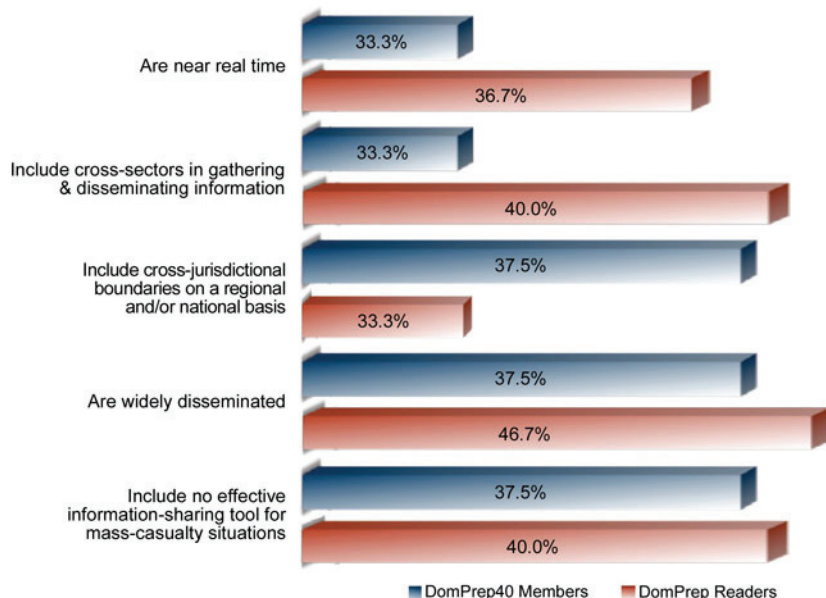
Readers were more optimistic than the DP40 were on the status of plans for alternative sites of care and alternative standards of care. Over 80 percent of readers believe there are adequate plans in place, whereas 60 percent of DP40 members hold the same view. “Preparing for the use of alternate sites and standards is a proactive requirement that must be addressed,” counseled Dr. Vanderwagen. “Plan for these, and exercise their use.”

In conducting planning for mass-casualty events - because we know that there are not enough hospital beds for all those needing care - we have planned for alternative sites of care and alternative standards of care.



DPJ readers and the DP40 were generally doubtful over the effectiveness of current information-sharing tools for mass-casualty event planning. “It is clear that development of a better information-sharing tool needs to be given priority,” Vanderwagen observed. “The critical need for pre-event communication and joint planning is primary across the sectors, but the lack of an information-sharing capability during an event will be catastrophic. The tools exist; it is time to reach a consensus and move forward on a means to assure that we are all using it.”

In conducting planning for mass-casualty events, we have effective information-sharing tools that (check all that apply)



Slightly fewer readers than DP40 members – 45.2 percent compared to 60 percent – strongly emphasized the need for the health and medical sector to plan for mass-casualty events with the public safety sector. Slightly more readers than DP40 members – 32.3 percent compared to 20 percent – said that joint planning with the public housing/mass sheltering sector is

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Executive Consultant, Collaborative Fusion Inc.

Robert Kadlec

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James Loy

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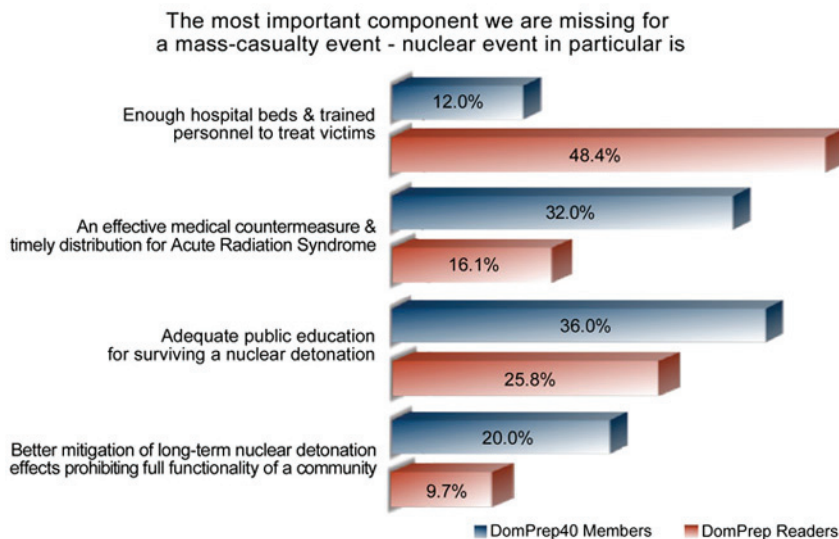
Richard Schoeberl

Former Executive, Federal Bureau of Investigation & the National Counterterrorism Center

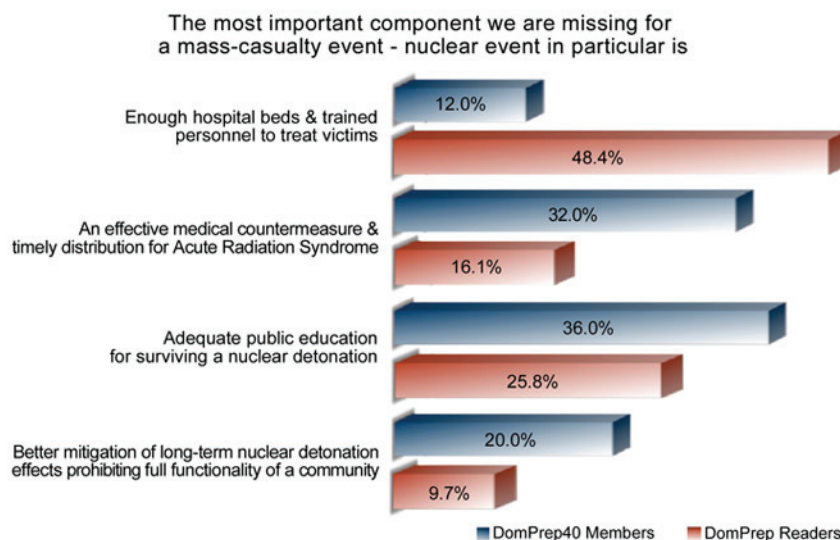
Dennis Schrader

Former Deputy Administrator, National Preparedness Directorate (NPD), FEMA

required. These responses suggest that there has not been enough public discussion on the effect of mass-casualty events on public order and how to preserve it.



When it comes to assessing some of the most important “missing components” of consequence management in nuclear mass-casualty events, the greatest divergence of views can easily be found. Readers were much more upbeat than the DP40 were on the availability of hospital beds. Far fewer readers put emphasis on the need for an effective medical countermeasure for Acute Radiation Syndrome – and a timely way to get it to people. Far fewer readers also were concerned about the long-term environmental mitigation requirements. Close to the same percentage of both groups, though, agreed on the need for better public education on how to survive a nuclear detonation. “Educating the public and assuring that we have means to communicate in near-real time with them about sheltering in place – and where and when to get countermeasures,” Vanderwagen concluded, “must be developed with our public safety partners and the media.”



DomPrep40 Members

Robert Stephan

Former Assistant Secretary of Homeland Security for Infrastructure Protection

Joseph Trindal

Former Director, National Capital Region, Federal Protective Service, Immigration & Customs Enforcement (ICE)

Theodore Tully

Director, Trauma & Emergency Services, Westchester Medical Center (Westchester County NY)

Craig Vanderwagen

Former Assistant Secretary for Preparedness & Response, U.S. Department of Health & Human Services

Maryland's Example

Negotiating Memorandum of Understanding for Sheltering

By Pamela Spring & Chief Rainier C. Harvey Sr., Health Systems

"The most important responsibility of any government is to protect the lives of its citizens, and the O'Malley-Brown Administration has worked hard with the dedicated staff to fulfill that great responsibility. With strong emergency preparedness and response plans, and the partnership of the men and women of Maryland, we can help save lives and property in the event of a disaster, whether it is an unplanned event such as a tornado, or an event with some warning such as our December 2009 snow storm. Together with first responders around Maryland, State agencies, our National Guard, 26 local emergency management directors, and our partners in neighboring states, our emergency management team works hard to plan for, respond to, and recover from any catastrophic event that could threaten Maryland's families."

—Governor Martin O'Malley (Maryland Emergency Management Agency Annual Report)



In the State of Maryland, the Department of Human Resources, the state's principal social services provider, is the primary agency responsible for coordinating Emergency Support Function #6 – Mass Care and Sheltering, Emergency Assistance, Housing, Feeding, and Human Services.

Prior to 2008, Maryland did not have the state shelters needed to support the mass care and sheltering of citizens from local jurisdictions, and/or surrounding states, in the event of a large-scale natural or manmade disaster. In early 2008, the Maryland Department of Human Resources (DHR), the Maryland Emergency Management Agency (MEMA), the Maryland Department of Agriculture (MDA), the Maryland Department of Disabilities (MDOD), and the American Red Cross (ARC) met with local emergency managers (LEMs) and representatives of other local agencies statewide who were involved with shelter operations.

These meetings were held to identify strengths and weaknesses within the area of regional mass care and sheltering. One major weakness addressed was the lack of a statewide mass-care and shelter strategy for catastrophic events. For example, if a regional evacuation was required, hundreds to thousands of people may require emergency sheltering, which would make the use of large facilities more economical. Thanks

in large part to this collaboration, Maryland identified the need to develop a *Statewide Mass-Care Shelter Strategy* for the delivery of mass-care sheltering during events that exceed local jurisdictions' capabilities.

Evacuation Needs – With Special Focus on the ISW

During a Notification, Evacuation, and Sheltering (NES) workshop in August 2008, one of the more important recommendations identified was the need for local jurisdictions to support state shelters throughout the region. That recommendation was partially predicated on an example provided by the LEM in Ocean City, Maryland, where there are 5,000–7,000 seasonal employees of the International Student Workforce (ISW) – who typically do not have either transportation or family in the area. It was determined that, if a hurricane or other severe weather event was predicted that might adversely affect the area, the ISW group would be evacuated early.

That same month, the Ocean City LEM approached the state and requested assistance in developing a plan to evacuate the ISW. Local and state officials including the MEMA Regional Administrator and representatives from a number of agencies – DHR, the Maryland Department of Transportation (MDOT), the Ocean City Town Council, and the Ocean City Chamber of Commerce, for example – met on numerous occasions to plan for the evacuation and sheltering of ISW members, who are primarily from Eastern Europe and Russia and rely heavily on public transportation.

Maryland's 12 December 2008 Evacuation and Relocation Plan for the Ocean City ISW was the beginning of an extensive effort to identify a long list of other facilities that could be utilized by DHR as state shelters. Among the numerous factors considered in selecting sites to be used for shelters were location, accessibility, compliance with ADA (the Americans with Disabilities Act) requirements, facility layout, back-up power, kitchen and restroom facilities, security, surrounding area, parking lot size, communications, proximity to evacuation routes and hospitals, and both ingress and egress.

After many such sites had been identified, the negotiation of numerous Memorandums of Understanding (MOUs) was a timely effort. Many local universities and colleges met the criteria that had been developed. In some cases, DHR, MDA, MEMA, and the LEM met with university officials to address issues and concerns through presentations and open question-and-answer sessions. The inclusion of LEMs was vital because most were familiar with the facilities – and some may have already been working under MOUs between the LEMs and the facilities.

Pet Projects vs. Usage Priorities vs. Signed MOUs

The MOU specifics varied from one facility to another. The sheltering of pets was an important issue, for example – some facilities were receptive to the idea and had areas identified for the sheltering of pets, but others were adamant about *not* having pets in their facilities. Both public and private facilities raised concerns about such matters as liability, control of the facility, security, the displacement and/or relocation of previously scheduled events, and the effect on students at the universities. In addition, some facilities were concerned about rental/usage fees and other costs associated with the use of utilities during shelter operations. Key players from all of the facilities represented participated in the walkthrough assessments and negotiations. Additional concerns were raised about usage “priority” – e.g., medical surge needs vs. sheltering requirements. In addition, although some facilities already had MOUs in place governing medical surge, some LEMs asked who would have priority of usage in the event that both medical surge and sheltering were needed within the same facility at the same time.

The choice of shelter sites and the operation of state shelters within local jurisdictions obviously would affect evacuation and transportation in those areas. It was quickly apparent, therefore, that the LEMs’ support and collaboration were of paramount importance in identifying and selecting the facility. The use of a collaborative effort was extremely important, therefore, particularly when developing MOUs for transfer points along evacuation routes.

An Historic Inauguration – Plus Mandatory Training

The 2009 inauguration of President Barack Obama, working from initial estimates of several million people attending, served as another call to action for the team. The so-called Whistle Stop Tour (WST) prior to the inauguration came through Baltimore, the state’s largest city, which hosted a scheduled National Secret Service Event (NSSE) at the city’s War Memorial Plaza. The NSSE events required an unprecedented level of regional collaboration and extensive pre-planning and coordination with the surrounding states and jurisdictions.

One major weakness addressed was the lack of a statewide mass-care and shelter strategy for catastrophic events; for example, if a regional evacuation was required, hundreds to thousands of people may require emergency sheltering, which would make the use of large facilities more economical

For the first time, a provisional state sheltering plan was created to deal with a possible disaster or evacuation during the inaugural week. Maryland did not initiate its own planning process for the inauguration until October 2008, however. The Presidential Inauguration Committee announced the WST specifics on 10 December 2008, and MEMA hosted the kickoff meeting for the tour on 19 December 2008. As the state’s lead agency for sheltering requirements, DHR had a short time frame in which to plan and coordinate with both the public and private sectors. The first state shelters were opened to support Washington, D.C., in the event of a natural or manmade disaster.

DHR and MEMA met with LEMs in the counties bordering: (a) the District of Columbia; and (b) Baltimore City – where the local WST event would take place. The D.C. evacuation plan called for attendees at the events scheduled in D.C. to evacuate into Maryland and Virginia. Shelters were opened at the University of Maryland at College Park (UMCP) and the University of Maryland at Baltimore County (UMBC), at the Level Fire Hall for the inauguration itself, and at UMBC for the WST in the event of an incident during the weeklong inaugural activities. The MOUs needed were aggressively pursued because time was of the essence. DHR was given short notice to have its shelters operational with prepositioned resources and staff. The initial MOUs

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established with the universities were short-term, but there was an understanding that long-term MOUs would be established after the event.

Concerns about January's extreme weather conditions and to help oxygen-dependent evacuees raised the need for backup generators to be installed at shelter sites as part of the preparations for a worst-case scenario. An emergency procurement was completed and both universities were pre-wired for backup power.

DHR has completed a state shelter plan that includes procedures for pets, special medical needs, feeding, and sheltering during a pandemic. Maryland currently has MOUs completed with eight public and private facilities for mass care and sheltering, plus two transfer points on the Eastern Shore. Again, all of these sites have been identified in conjunction with the local LEMs. In addition, Maryland is currently working with surrounding states to establish MOUs for host shelters.

In an effort to fulfill its mission to protect the citizens of Maryland, DHR Secretary Brenda Donald has mandated that

all of the agency's 7,000 employees be trained in, among other skills, emergency preparedness, shelter management operations, and disaster mental health. She also has mandated that such training be part of a greater effort – to build a well trained and equipped workforce throughout the entire state to ensure that Maryland has the surge capacity needed to respond to a large-scale event.

Pamela Spring (pictured), director of the Office of Emergency Operations within the Maryland Department of Human Resources, oversees the state's emergency and disaster response operations – her office also represents the Maryland Department of Human Resources at the State Emergency Operations Center (EOC) during an activation. Spring began her career in 1987 as a social worker with the Baltimore County Department of Social Services (DSS) and served for 10 years as the primary EOC representative from DSS to Baltimore County's EOC. She has participated in numerous activations – including the Presidents' Day snowstorm, Hurricanes Floyd and Isabel, and the 2009 Presidential Whistle Stop Tour/Inauguration – and a large number of training exercises. She also has served on the Maryland H1N1 Leadership Task Force, and continues to serve on various high-level committees in Maryland and the National Capitol Region.

Rainier Collins Harvey Sr. is chief of the Division of Administrative Operations for the Maryland Department of Human Resources. Prior to assuming that position he served as executive assistant for the Baltimore City Department of Social Services Bureau of Human Resources and Facilities Management. He graduated from Marymount University in Arlington, Virginia, then served as a Law Enforcement Officer for the Baltimore County Police Department.

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Understanding Surge Capacity: A Much-Needed Primer

By Raphael Barishansky, Public Health



No matter what the disaster – natural, man-made, or technological – there is a very real possibility that the health care infrastructure of a municipality, county, region, and/or state will be overwhelmed at one time or another.

Health care systems are “first receivers” for incidents of all sizes and varieties and can easily be thrown into chaos because of their typical inability to respond both quickly and effectively. Most U.S. health care systems are already stretched to their limit on a daily basis, and for that reason alone the additional stress of an unexpected surge from a catastrophic event can quickly stretch their capacity beyond the normal breaking point.

The American College of Emergency Physicians (ACEP) defined surge capacity – in a 2004 Policy Statement (*Health Care System Surge Capacity Recognition, Preparedness, and Response*) – as “a measurable representation of a health care system’s ability to manage a sudden or rapidly progressive influx of patients within the currently available resources at a given point in time.” Surge capacity also can be defined as the maximum delivery of services that a system can provide if all available, or potential, resources – e.g., beds, equipment, supplies, pharmaceuticals, and personnel – are mobilized. The surge of patients entering a hospital or emergency medical services (EMS) system following any large-scale incident has the potential, therefore, to be overwhelming to even the well-prepared system.

In today’s world, unfortunately, the creation of adequate surge capacity in a health care system is an absolute necessity, just as the ultimate goal during a surge situation is to do the most good for the most people – as well and as rapidly as possible. In the post-9/11 era there has been, in fact, a definitive shift away from individual care to population care. To facilitate that shift, hospitals and other patient-care facilities should develop and institute the triage protocols required for the prompt recognition and isolation of those needing immediate care. This is particularly urgent in the event of an influx of patients presenting themselves to an emergency department/clinic with a communicable disease of public health significance that is either suspected or confirmed – e.g., an outbreak of severe acute respiratory syndrome (SARS) or pandemic influenza, or following a bioterrorist attack involving the plague or smallpox.

Acute, Chronic, and The Outward Characteristics of Each

When examining the requirements for surge situations themselves and/or the capacity of health systems to handle such situations, one must consider two different types of incidents – “acute” and “chronic” – that could lead to those situations. Following is a brief description of each:

Acute Events – e.g., chemical attacks, explosive events, and even meteorological events such as tornadoes – will usually be defined by the following characteristics: hard hitting, immediate impact, the majority of casualties in a very short time frame, trauma to the health care system itself, and responses/reactions based on previous planning.

Chronic Events – e.g., a biological attack, a radiological release, and even a natural event such as flooding – will usually (but not always) display the following operational characteristics: slower moving, a gradually expanding impact, increasing effects, exponential increases in casualties, a surprised (and sometimes overwhelmed) health care system, responses/reactions based on planning, and an adaptation capability.

Both types of events have the potential to force a large number of patients, and their relatives, into the health care system. For the most part, therefore, an effective surge plan should focus on: (a) Material resources – supplies and equipment including, but not necessarily limited to, beds, ventilators, and a broad and varied inventory of other health care instruments and devices; and (b) Staff (personnel) – the critical points here include ensuring that the staff has been cross-trained to handle a surge event and that there are enough staff members who are able to, and will, report to work even during an event that might affect them and/or their families personally. Meeting the latter requirement involves: (1) knowing how quickly the facility can notify and assemble additional necessary staff during a surge event; and (2) maintaining the appropriate training – particularly ICS (Incident Command System) training; HICS (Hospital Incident Command System) training; and PPE (Personal Protective Equipment) training – for all levels of staff.

Structural Requirements – Plus the Overall Good of the Community

The physical *structure* of a building is another extremely important planning factor. Obviously, surge facilities should have



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the physical space needed to adequately handle not only the surge but also the management infrastructure needed to support surge operations, including planning for the implementation of alternative care sites (ACSSs).

It is particularly important to remember that surge capacity in health care is about much more than simply having a few extra collapsing beds available and/or possessing the ability to recall personnel in the event of a large-scale incident. It is about having both a plan and a system already in place; about the training of personnel (utilizing the full spectrum of exercises – table top, functional, and full-scale) available; about understanding what went right and wrong during those exercises; and about having the ability, and the willingness, to modify the plan based on the lessons learned.

Experience also has shown the need for close collaboration between EMS systems, hospitals, emergency management, and health departments to begin to build a realistic approach to surge capacity. The processes involved, however, require not only early assessments and meticulous curriculum development but also both effective training and outreach capabilities.

Developing a realistic surge capacity is clearly easier said than done. It involves a significant commitment of funds, time, public support, and political buy-in. Health system leaders must therefore be prepared to argue – and prove – that the development of a surge capacity is not simply a health issue but also, and primarily, a major *community* issue.

Having a surge capacity plan in place, well before a worst-case situation, will ultimately benefit the public under normal busy conditions as well as in the event of local or regional disasters that threaten the very survival of the community. The ultimate vision must be a seamless system of health care surge capacity, throughout the country, that is capable of responding effectively and efficiently to public health emergencies of all types and all sizes, ranging from small but significant incidents to large-scale multi-casualty disasters.

Raphael M. Barishansky, MPH, is currently the Program Chief for Public Health Emergency Preparedness for the Prince George's County (Md.) Department of Health. Prior to establishing himself in this position, he served as Executive Director of the Hudson Valley Regional EMS (Emergency Medical Services) Council, based in Newburgh, N.Y. A regular contributor to various journals, he can be reached at rbarishansky@gmail.com

Electronic Medical Records – Potential Benefits of A “Health Cloud”

By Rodrigo (Roddy) Moscoso, Law Enforcement



In modern society there is a seemingly limitless wealth of data available at the push of a button. From any location around the globe, and even on commercial airline flights, almost anyone can access data and communicate in real time, online, with almost anyone else in the world. A wealth of information – about music, movies, TV shows, books, magazines, and breaking news as well as historical data – is remotely accessible through the use of pocket-size devices that are perpetually connected.

However, electronic medical records (EMRs), which have significant implications for the welfare of the general population, remain a huge and particularly notable omission from this ubiquitous data stream. This is deliberately so, because the security of electronic medical records is an absolute requirement to ensure public trust in and acceptance of these still emerging systems. The downside, of course, is that the ability of healthcare professionals to quickly and effectively provide quality care to their patients is severely hindered by the lack of speedy access to the EMRs.

To date, the use of EMRs in hospitals and private practices is extremely limited. Last year, the *New England Journal of Medicine* studied the adoption rate of EMRs by U.S. hospitals and found that only 7.6 percent had access to even “basic” EMR systems, and only about 1.5 percent had access to more comprehensive systems. Another study, carried out by the National Center for Health, found that, in private physician offices, the adoption rate of EMRs is much higher – 38.4 percent reported using partial or fully electronic EMR solutions. (However, 20.4 percent of the physicians surveyed reported that these systems were only minimally functional.)

Is VistA CPRS the Solution?

Although the overall use of EMRs in the United States remains low, the largest single U.S. medical system – that of the Veterans Health Administration (VA) – has successfully deployed an enterprise-wide EMR system (VistA CPRS) that demonstrates the value that EMRs can provide to both patient and doctor. In 2006, VistA won the Harvard Kennedy School of Government’s prestigious “Innovations in Government” Award.

Physicians who have used VistA CPRS (this somewhat awkward double acronym stands for the Veterans health information system and technological Architecture's Computerized Patient Recordkeeping System) report that the system allows them to provide a more comprehensive level of care to their patients, particularly when several doctors are involved in treatment of the same patient. One reason for this high approval rating is that VistA CPRS enables doctors to require an "electronic sign-off" on orders – including prescriptions, tests, procedures, etc. – by other doctors who are providing care to the same patient. The system also electronically prompts doctors to review and accept recommendations from other physicians, thereby forcing a degree of collaboration that has become somewhat less common in today's era of specialty-based medicine.

When doctors themselves do not have easy access to EMRs, it is often the patient who bears the burden of coordinating his or her care, including the collection and distribution of test results from one doctor's office to another's. Because of the limitations inherent in traditional paper-based care, combined with the fragmentation of services caused by a lack of integrated patient data, some physicians have found it difficult to transfer information from the VA system to hospitals lacking comprehensive access to EMRs.

A Difficult Deadline – Eased by Funding Assistance

The landmark Healthcare Reform Bill enacted into law earlier this year not only sets a 2015 deadline for all hospitals and physicians to acquire and be using comprehensive EMR systems, but also provides some of the funding needed to make that transition. However, because of the unique nature of the "universal care system" provided by the VA, the successes realized by the VistA CPRS will be more difficult to replicate in the private sector.

When all patients are covered by a single healthcare provider, it is easier to standardize information on a single electronic system. Moreover, the VA has spent many years implementing and improving the VistA CPRS system. Nonetheless, most physicians and hospitals will have to quickly invest time and resources in EMRs in order to meet the 2015 healthcare-reform deadline. Moreover, they will have many different commercial solutions from which to choose and thus many important decisions to make.

The competitive EMR market will also present some other challenges, most notably in the area of data exchange.

New technical standards that address the need for system interoperability are currently being prepared by the U.S. Centers for Medicare and Medicaid Services. These standards should help minimize data-sharing problems between providers. Nonetheless, it will not be as easy a task as implementing a single system, such as the VistA CPRS, within a single organization.

Maintaining Security While Maximizing EMR Benefits

Looking ahead to more widely deployed EMR systems, the benefits may extend well beyond improvements to individual patient care. Interconnected EMR systems may be able, for example, to automatically identify trends in clinical symptoms – including the early predictors of a pandemic as well as the success rate of certain types of treatment. EMRs could also link directly into the federal Centers for Disease Control and Prevention (CDC), as well as other existing patient tracking and emergency management systems, to improve situational awareness and response.

As previously noted, though, effective security measures and electronic backup and restoration capabilities must be part of the solutions implemented in order to: (a) continue to ensure both security and patient privacy; (b) build and maintain the public's trust in these new systems; and (c) ensure that the health data "cloud" does not disappear. Last year, the Virginia Department of Health Professions' Prescription Monitoring Program website was "hijacked" by computer hackers – who demanded a \$10 million ransom for the restoration and nondisclosure of more than eight million patient records.

Although secure backups of the data were ultimately restored, Virginia was forced to temporarily shut down the program's website. As more and more EMR systems are adopted and begin exchanging data, such hacking attempts will surely increase. The general public will have little if any tolerance, though, for such security breaches. To be successful over the long term, therefore, the EMR "industry" as a whole must extend the notion of "universal care" to the veritable mountain of patient health data entrusted to it.

Rodrigo (Roddy) Moscoso currently serves as Communications Manager for the Capital Wireless Information Net (CapWIN) Program at the University of Maryland. Formerly with IBM Business Consulting Services, he has over 15 years of experience supporting large-scale IT implementation projects, and extensive experience in several related fields such as change management, business process reengineering, human resources, and communications.

Critical Infrastructure Resilience

Leadership and Stewardship in Microeconomic Decision-Making

By Dennis R. Schrader, CIP-R



The homeland security enterprise needs engineers who develop their careers in order to lead and assume responsibility for resilience as a design parameter. The “Guiding Principles” developed by the American Society of Civil Engineers (ASCE)

for the nation’s infrastructure advocate that design professionals “exercise sound leadership, management, and stewardship in decision-making processes.” Doing so requires a project-design executive whose career development has been shaped by the type of thinking postulated by the ASCE.

In July 2009, Mitchell D. Erickson of the Department of Homeland Security’s Science and Technology Division wrote an excellent paper for a Columbia University workshop that begins to analyze the tactical framework needed to move infrastructure resilience from theory to reality. The paper does a commendable job of quantifying and analyzing the roadmap for resilient infrastructure.

In a February 2010 DomPrep survey, there was general agreement among readers that resilience is an outcome of system design. There also was a sense that engineers must be better integrated into public safety affairs. Erickson’s paper discusses not only the designer’s role but also the interdisciplinary nature of the new design mandate to achieve resilience.

Focusing Greater Attention On the Forgotten Factor

However, Erickson’s paper – like many other papers and books on the subject – originates from a macroeconomic point of view rather than from a microeconomic examination. In the United States, decisions about infrastructure projects usually are made in private and/or public boardrooms and generally are not focused on resilience.

Somewhat paradoxically, though, engineers more or less act as an owner’s “agent” in the planning and design of infrastructure. This implies that the fee paid by the owner includes not only

pure design services but also professional decision-making advice and guidance on other matters. Owners themselves, though, are not necessarily interested in changing the design status quo and often, therefore, view design fees as part of the fixed overhead required to get the project done.

Engineers and architects have key roles to play both in consulting the client on innovations and in producing plans and specifications. For some design professionals, however, the rough and tumble of selling infrastructure innovations is not an appealing chore.

There was general agreement among readers that resilience is an outcome of system design; there also was a sense that engineers must be better integrated into public safety affairs

The Maryland U And West Point Examples

In the late 1980s, University of Maryland Medical System CEO Morton Rapoport set out to rebuild the decayed infrastructure of his institution. One of his more important objectives was to modernize the systems involved – but he also recognized that, to attract patients to downtown Baltimore, a large urban medical center had to behave and “feel” somewhat like a secure shopping mall. He set achievement of that objective as his vision of what the future medical system

would look like, and for 20 years the planners and design professionals involved in the project strived to bring that vision to reality.

There were many boardroom debates, of course – over money and priorities, for example, and the best timing for the use of scarce capital – but at the end of the day each individual component of the \$500 million project contributed to achievement of the vision. Even with executives who intuitively understood the value of life-cycle thinking, however, it was a long and difficult struggle to gain approval for each change that moved the vision closer to reality while at the same time: (a) carefully integrating existing systems; (b) surgically removing outdated equipment; and (c) replacing other systems with new technology.

Not every executive is inclined to follow Rapoport's example, but if a designer works in close cooperation with the owner the goal of resilience can be achieved, to at least some degree, by advocating for it *during* the process. The resilience will be built-in, therefore, through the microeconomic decisions that are made in the thousands of projects that are projected to be built – at a total cost of almost \$1 trillion – to expand, maintain, and improve the nation's infrastructure over the next five years. These cost/

benefit decisions are made by owners every day with the help of designers, sometimes as bystanders and sometimes as active participants in the process.

To that end, Lieutenant Colonel Steve Hart of the U.S. Military Academy's Civil and Mechanical Engineering Department developed not only a course of study but also the first, in 2010, of what is intended to be an annual symposium for his students (and those from

other universities) to explore Critical Infrastructure Resilience and Protection. One of the principal lessons learned from his efforts this past year is that there are very few engineering departments currently focused on the resilience of Critical Infrastructure.

That may change in the not-too-distant future, though, thanks in large part to Colonel Hart's efforts. Fortunately, there is a growing awareness that: (1) The roadmap to achieving resilience is paved with many microeconomic decisions; and (2) Both education and career development are critical to the long-term process of building resilience – primarily by following the ASCE Guidelines mentioned earlier.

For additional information
A Bridge to Prosperity: Resilient Infrastructure Makes a Resilient Nation; Presented at Aging Infrastructure Workshop July 21-23, 2009

Captain Dennis R. Schrader, USNR (Ret.), is president of DRS International, LLC, and former deputy administrator of the Federal Emergency Management Administration's National Preparedness Directorate. Prior to assuming his NPD post he served as the State of Maryland's first director of homeland security, and before that served for 16 years in various leadership posts at the University of Maryland Medical System Corporation. A licensed professional engineer in the State of Minnesota, he holds a bachelor of arts degree, with a focus in engineering, from Kettering University, and a master's degree from the State University of New York at Buffalo. While on active duty as a Navy Civil Engineer Corps officer he served overseas tours in Guam, Diego Garcia, and Sicily. He also has served on numerous homeland-security committees, including the Anti-Terrorism Advisory Council of Maryland and the Homeland Security Senior Policy Group.



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Preparing for Unexpected Hospital Surges

By JL Smither, Public Health

Any public health emergency will cause a rush on hospitals for medical assistance, but this is especially true with influenza pandemics and outbreaks of other infectious diseases. Hospitals and local public health departments therefore must work together so that they are prepared to handle a surge of patients.

Before the Severe Acute Respiratory Syndrome (SARS) outbreak affected 29 countries in 2003, hospitals in the Toronto, Canada, area had surge support plans in place. Nearly half of the nursing positions in the area at the time were staffed by part-time nurses who frequently rotated between medical facilities, and each of these facilities included these part-time nurses in their surge support plans. However, during the SARS outbreak in Canada, approximately 40 percent of possible infectious and quarantined patients were health-care workers themselves. To curb the spread of SARS, many hospitals were placed under quarantine, restricting the movement of the part-time nurses who were needed to help out at other facilities.

To fill the gaps left by rotating nurses who were not permitted to leave one facility and report to another, some hospitals offered double and sometimes triple pay to nurses who had not been quarantined. Although this tactic enabled some hospitals to fulfill their staffing needs, there were other hospitals that could not follow suit. After the quarantine ended, the hospitals in the Toronto area agreed to develop surge support plans that take into account the possible depletion of available part-time nurses as well as other potential restrictions on movement throughout the area.

Pre-Planning, Alternative Triage, And a Cooperative Approach

In addition to patients requiring antivirals and treatment, medical facilities may also experience a surge in mental health patients during a disease outbreak. In January 2007, the Region III Office of Public Health of the Louisiana Department of Health and Hospitals hosted a tabletop exercise to test its pandemic-influenza response plans. During the exercise, participants noted that the demand for mental health services in Louisiana has remained high ever since Hurricane Katrina – during which time Region III employed only one pediatric psychologist and could not keep up with the demand.

Exercise participants expressed concern that a pandemic influenza outbreak would only add to the problem, completely overwhelming mental health facilities in the area. To address that problem, the state's Office of Public Health and Office of Mental Health agreed to develop a regional mental-health surge support plan that would consider all in- and out-patient facilities in the area as potential alternate facilities.

Another problem addressed during the tabletop exercise was the delay in hospital services caused by overflow issues. The exercise participants worried that, even with surge support in place, many citizens would rush to hospitals that distribute antivirals, overwhelming the staff members at those hospitals. The overflow also would significantly extend the wait times experienced by EMS (emergency medical services) personnel after they deliver patients to the hospital. To resolve that problem – and to ensure that ambulances are available to those who need them, instead of waiting empty at the hospital – region officials agreed to consider alternative triage strategies. Regional plans now may include, for example: (a) establishing a telephone triage system to condense ambulance runs; and/or (b) engaging firefighters as alternate EMS providers. In addition, hospitals are permitted to create holding areas where patients may be dropped off (which would free the ambulance for other duties), or they may send health-care providers with the ambulances to conduct home-based triage.

Even with surge support plans in effect, of course, medical facilities may still be overwhelmed by the demand for their services. Nonetheless, only by planning for alternative scenarios in advance, and by working closely with other facilities in the region, can hospitals hope to meet the needs of their patients.

For additional information on hospital surge support, visit Lessons Learned Information Sharing at www.llis.gov.

Jennifer L. Smither is the outreach and partnerships manager for Lessons Learned Information Sharing (LLIS.gov), the Department of Homeland Security/Federal Emergency Management Agency's national online network of lessons learned, best practices, and innovative ideas for the U.S. homeland-security and emergency-response communities. Ms. Smither received her bachelor's degree in English from Florida State University.

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New York, Alaska, California, and Alabama

By Adam McLaughlin, State Homeland News



New York TSA/NYPD Focus on Baggage Screening on NYC Subways

It was almost assuredly an unrelated coincidence but, only 11 days before the Times Square terrorist bombing attempt, New York City's mass-transit commuters were surprised to see federal TSA (Transportation Security Administration) employees screening luggage at local subway stations.

A TSA spokeswoman said that the agency had launched a pilot partnership with the New York Police Department (NYPD) that morning (Wednesday, 21 April) to enhance security on city trains. According to the NYPD, about a dozen stations are expected to be covered each day.

Although there is "no specific threat to mass transit in the United States at this time," according to a statement released by the TSA, that agency and the NYPD plan to "continuously work together to strengthen overall security efforts and keep the American people safe."

At the 40th Street and 8th Avenue entrance to the Port Authority Bus Terminal, TSA staffers started a random search of passengers' baggage at about 4:00 p.m. Screeners said that most passengers seemed generally happy to comply. "For the most part, people co-operate fully," said NYPD Lt. Francis O'Keeffe, who oversaw the operation.

One passenger, Latifa Ziyad from Boston, who was visiting her three daughters, said she has no objection to the searches if they make people safer. "As long as I am not getting singled out because I look a certain way, it is okay," she said. Others seemed to be just as willing to comply – but also were eager to get on with their daily routines. "It is all right, I have nothing to hide," said accountant Ramone Esmilla as officers tested his knapsack – which was filled with gym clothes. "But I just want to get out of here and pick up my kid."

The TSA name for the inspection teams, which use chemical swabs in their random screens of passenger bags, is "VIPRs" (pronounced vipers), a shorthand term for Visible Intermodal Prevention and Response.

Subway baggage checks have been routinely conducted by the NYPD since 2005, starting not long after the London subway bombings. Spokeswoman Ann Davis would not say how long the new TSA/NYPD program will last, but suggested that NYC's mass-transit riders should anticipate a TSA presence underground "for the foreseeable future."

Alaska National Guard Partners with Emergency Responders in Disaster Training

Members of the Alaska National Guard have been joined by 50 other state and federal organizations and agencies participating in Vigilant Guard, a disaster-based training scenario that tests the coordination of these disaster-preparedness organizations.

"We are testing an unbelievable amount of effort and synchronization," said Army Major General Thomas H. Katkus, adjutant general of the Alaska National Guard. "Every one of them is a little bit different in what we are trying to do, but it is one driving factor – the earthquake – that affects everyone across the broad spectrum."

Working closely with local first responders in a training environment will help strengthen the bonds between and among all of the agencies participating in Vigilant Guard if and when an actual large-scale disaster or emergency does occur. "It reinforces those relationships that we said, and I have always professed, are critical," Katkus said, "if we are going to be successful in a large-scale response."

The exercise also reinforces the Guard's role within the local community, he quickly added. "What it says is we are effectively involved in our communities. We are effectively involved in our government, and we are trained and ready and prepared to not only respond effectively, efficiently, and timely, but with the right resources.

"We have ... the right mix of engineers and different folks, [who] can get out there and assist with getting an adequate inventory of what has been damaged and what is still in existence," Katkus continued. "Training events like this make us much more able to synchronize and bring to bear resources

that are needed to fix the problem. This is why you rehearse. To do this without rehearsing would be a bad day.”

Prominent among the other Guard units taking part in the exercise were: (a) Chemical, Biological, Nuclear, and High-Yield Explosive Enhanced Response Force Package teams, which specialize both in search and rescue and in medical triage; (b) Expeditionary Medical Support teams, which provide rapid, on-site medical care; and (c) Civil Support Teams, whose mission is to detect and identify chemical agents.

Through the Joint Incident Site Communications Capability – a mobile communications package – state, local, and federal agencies will be able to communicate with one another despite being on, and using, different radio frequencies. In addition, Katkus pointed out, the system provides telephone and satellite communication abilities, which translate into a major “reach-back” capability. Possessing that communications capability is extremely important in a state as large as Alaska, particularly when the closest other state is more than 2,000 miles away.

Alaska residents are well aware, from first-hand experience, of how important it is to be able to maintain reliable communications after a major earthquake.

In March 1964, the state endured a 9.2 magnitude earthquake, the most powerful on record ever to hit North America. “I was alive in 1964 when we did experience this magnitude of an event,” Katkus commented. “To now look at the preparation, the technology, and how much we have transformed as a state since 1964 – and what we [now] have as far as capacity and capability to respond in an organized manner – is amazing.”

California **Collaboration Mandatory** **In Bay Area’s UASI Governance Structure**

In California, the Bay Area Urban Areas Security Initiative (UASI) is unique. Counting only the government entities that are directly involved, the Bay Area’s UASI consists of 10 counties, three “core” cities – i.e., major metropolitan areas – and more than 100 incorporated cities. The area’s

geography provides even more diversity with its several coastal regions, a major mountain range, rural valleys, numerous agricultural areas and suburban locales, and a high population density. Not surprisingly, it is ranked as a “Tier I” UASI, which means, not too comfortingly, that it also is considered to be one of the highest-risk areas in the nation, along with such “mega-cities” as New York and Chicago.

By definition, according to the Federal Emergency Management Agency (FEMA), the UASI program “focuses on enhancing regional preparedness in major metropolitan areas. The UASI program directly supports the national priority on expanding regional collaboration in the National Preparedness Guidelines and is intended to assist participating jurisdictions in developing integrated regional systems for prevention, protection, response, and recovery.”

Late last month, Laura Phillips, general manager of the Bay Area UASI, spoke to attendees at the All-Hazards/All-Stakeholders Summit in San Francisco about what was described as a federally mandated 2006 “shotgun marriage” of three California UASIs – in San Francisco, Oakland, and San Jose – to force an improvement in their collaborative activities. The three UASIs were given

60 days to assemble their respective stakeholders for the development and approval of one-year governance agreements.

Phillips said she believes that rural areas should be included in such agreements, even though they are not UASI partners per se. Rural areas are, in fact, often viewed as being outside of the core area affected by an emergency or disaster – but they play an important role during the evacuation process when countless thousands of citizens (and thousands of tons of material resources) are forced to move out of the downtown urban areas. For that reason alone, Phillips pointed out, examining how the flows of people and material goods will affect the rural areas should be considered during the planning process.

The Bay Area UASI’s success is partially credited to its tiered governance structure, which allows collaboration and coordination of multiple funding sources toward a specific

Rural areas are often viewed as being outside of the core area affected by an emergency or disaster – but they play an important role during the evacuation process when countless thousands of citizens are forced to move out of the downtown urban areas

goal. To reach that goal, Phillips said, “We should have a road map and know exactly what we want to spend it on.” Because investments are guided both by strategic plans and by gap analysis, a carefully thought-out planning process is essential.

The Bay Area’s overall governance structure is broken down into three principal subsets: Approval Authority; Advisory Group; and Working Groups. The Approval Authority is represented by the three major cities involved – San Francisco, San Jose, and Oakland, plus the counties in which they are located. The Approval Authority provides policy direction and is responsible for final decisions related to specific projects, and for funding.

According to the UASI website, the Advisory Group’s primary goal is to ensure that projects undertaken by the UASI are truly regional in nature. Reportedly, much of the Bay Area UASI debating occurs during closed meetings of the Advisory Group.

As might be expected, the various working groups represented in the governance structure focus on a broad spectrum of specific initiatives, including but not necessarily limited to such important matters as regional planning; training and exercises; CBRNE (chemical, biological, radiological, nuclear, and explosives) detection; medical and health requirements; infrastructure protection; citizen preparedness; and emergency management. The working (and planning) groups use both risk- and threat-based formulas to enhance and improve their planning and preparedness processes in each of these areas of concern.

Alabama Rehearses Lane-Reversal Plan In Preparation for 2010 Hurricanes

Last Wednesday, the Alabama Department of Transportation carried out its annual rehearsal of the state’s Gulf Coast evacuation plan to cope with major hurricane events. Basically, the plan focuses on reversing the southbound traffic on Interstate 65 (I-65) to permit the use of four northbound lanes during the evacuation effort.

“Contraflow” is the term used to describe evacuation situations in which highway lanes are used to carry traffic in a direction opposite to their usual norm – e.g., when I-65’s usual southbound lanes are used to carry northbound traffic

(and, of course, are closed to cars heading south). During the 12 May rehearsal, an estimated 200 or so employees of the Alabama transportation department, as well as state troopers, were positioned along I-65 between Baldwin County and Montgomery to simulate the actions and operations required to safely reverse the normal I-65 traffic flow.

Alabama developed its initial hurricane evacuation plan in 1999, after Hurricane Floyd hit the U.S. East Coast, to reverse the traffic on I-65. Considerable advance planning since then, combined with the annual rehearsals carried out since the spring of 2000, made Alabama’s real-life contraflow efforts during Hurricanes Ivan and Dennis a pronounced success – and, according to the Alabama Department of Transportation, played a major role in evacuating the state’s Gulf Coast without any hurricane-related loss of life.

The department also pointed out that the plan for reversing Alabama’s I-65 traffic consists of 120 steps and requires 200 Department of Transportation employees as well as 140 state troopers, plus additional personnel provided from the Alabama National Guard, state and local emergency-management departments, and local law-enforcement agencies. The rehearsals not only simulate the lane-reversal activities that might be required during real hurricane evacuations but also provide an opportunity to practice each of the numerous steps required in the process. Typically, the personnel involved in the rehearsal will pre-position themselves, and their equipment, just as they would during their responses to a real hurricane evacuation.

Traffic was not actually reversed or detoured anywhere along I-65 during the training exercise – but every other step in the well detailed plan was simulated to the highest degree possible. Personnel were pre-positioned at numerous checkpoints, for example, along I-65 between the initial crossover south of State Road 225 in Mobile County and the north terminus just north of Exit 167 in Montgomery. There were 24 assigned checkpoints, and 22 interchanges along I-65, also involved in the lane-reversal exercise.

Adam McLaughlin is with the Port Authority of NY & NJ, and is the Preparedness Manager of Training and Exercises, Operations & Emergency Management, where he develops and implements agency-wide emergency response and recovery plans, business continuity plans, and training and exercise programs. He also designs and facilitates emergency response drills/exercises for agency responders, state and federal partners, and senior Port Authority executives.



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