INTEGRATED MEDICAL DISASTER RESPONSE: A CASE STUDY OF THE VIRGINIA EMERGENCY MEDICAL SERVICES SYSTEM

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INTRODUCTION

Disasters come in many types and sizes with a wide variety of causations. They have in common, however, the need to mobilize resources, assess the situation, and develop policy and strategies for their control. In any community, the medical resources of the community have a potential or actual role in protecting the jurisdiction in most disaster scenarios. These medical resources cover a wide range of types of medical practice. At the one end public health practitioners have critical roles in protecting the community from disease and environmental impacts of disaster events; at the other end mental health and veterinary practitioners tend to specific types of impacts and non-human populations. Somewhere in the middle lies the patient access, rescue, and treatment system of the community, its emergency medical services. For the purposes of this paper, I include in the emergency medical services both the prehospital and hospital emergency care components, as these must work in tandem if disaster mortality and morbidity is to be reduced.

This paper describes the evolution and current state of Virginia’s disaster medical system in the above context. Preliminary unpublished research by Wendi Harris and George Mueller at the University of Richmond indicates that this system has unique features when compared with other state systems. These features may be of interest to anyone responsible for medical response to disasters.

THE LOCAL MEDICAL RESPONSE TO DISASTERS

Disaster Response is a Local Issue

All response to disasters in the United States is fundamentally and initially a local response. This is true legally in that state codes typically assign local elected officials responsibility and broad authority to direct and control governmental response within their jurisdictions (Commonwealth of Virginia 1999a). It is true politically, even if there is a constant tension between levels of government to assign responsibility for making politically and economically unpopular decisions (the decision to evacuate in the face of hurricanes is the classic example). It is true doctrinally. And most importantly, it is true operationally - resources from outside the impact jurisdiction will not arrive immediately to resolve a local emergency (Old Dominion Emergency Medical Services Alliance 1993). Even when such resources do arrive, they must typically integrate with an
existing local jurisdiction response already in progress (Franklin Flood of September 1999).

**Disaster Defined**

Local medical response to disasters is dependent upon how one defines a disaster. In the emergency management community disasters may be defined by specific types of events – the Code of Virginia, for example, specifically mentions hurricanes, tornadoes, floods, etc. (Commonwealth of Virginia 1999a). Operationally the definition of a disaster may be framed in the sense of meeting certain specific types of events. For example, one could argue that a disaster occurs when the emergency operations center is opened, the emergency operations plan implemented, a declaration of emergency or disaster proclaimed, and local resources fully committed to dealing with the impact to the extent that additional funding and authorities are necessary for a successful outcome.

There is certainly a well-established legal definition of a disaster. Although The Code of Virginia (Commonwealth of Virginia 1999a) mirrors federal statute (United States 1996b) in defining disasters in terms of types of occurrences and severity, the operational reality is that a disaster is a disaster when someone who is authorized to declare an event to be a disaster goes ahead and does so. In Virginia this means that chief executives of local jurisdictions declare Local Emergencies, the Governor declares a State of Emergency, and the President declares a Disaster.

However, the medical definition of disaster departs radically from either of the commonly accepted models I have described. There is a generally accepted understanding among practitioners that “disaster” and “mass casualty incident” are synonymous terms (Commonwealth of Virginia 1988, Landesman 1996). In turn a mass casualty incident is defined as “any incident that injures enough people to overwhelm the resources in a particular system or area” (Barbour, Brazzle, et. al. 2001a). The Joint Commission on Accreditation of Healthcare Organizations’s requirements reinforce that understanding by emphasizing exercises that involve patient reception and movement (Joint Commission 2000). This understanding is not universal; for example, Auf der Heide addresses a full range of disaster events in his Community Medical Disaster Planning and Evaluation Guide (1995).

**The Local Medical Response to Disasters**

In Virginia the local medical response process for disaster events is, in general, similar to the response process anywhere else in the United States. This process is also not radically different from the response process for a single myocardial infarction or a single one-patient-one-car-one-telephone-pole traffic accident. Figure 1 depicts the flow

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1 It is questionable whether mass casualty incidents overwhelm systems. Although a mass casualty incident clearly has the potential to overload the emergency medical services, communications, and hospital capabilities, it is questionable whether this overloading is more than transitory in nature. The fact that mass casualty incidents are managed effectively using available resources combined with emergency procedures suggests that they are not truly the end of a system’s capability to function.
of activity. There may be local differences - for example, in Virginia many fire departments provided the extrication capability as a separate operational function and not part of the Medical Group, and in some cases patient assignment to facilities is handled by the Transportation Unit Leader rather than a command hospital. However, field practitioners in any part of the state would recognize the components depicted.

Figure 1. A Conceptual Model of Local Disaster Medical Relationships

Note: EMS is the acronym for emergency medical services, normally provided by emergency medical services agencies (volunteer, governmental, or commercial) and fire departments.

The question becomes how to best manage the event that exhausts resources, whether that exhaustion is immediate and acute (a 40 patient bus accident in a rural county) or delayed and chronic (the third day of emergency medical services response to a greatly increased call volume for disaster related problems that are only peripherally medical in nature). Figure 2 provides a depiction of the cascading of resources to support local requirements.

It is important to note that this is a two directional flow. Initial requirements are met by mutual aid and automatic aid resources in neighboring jurisdictions (assuming these are available), followed by state resources (if the state has deployable civilian or...
National Guard medical resources), and finally by federal resources (military and National Disaster Medical System). In each case, the system theoretically waits until the resources at a lower level are exhausted before invoking a higher level, although in practice state and federal resources are normally on heightened alert and may be deployed in readiness. It is also important to note that exhaustion is a relative concept. Experience suggests that local resources are not actually exhausted and continue to operate at close to full capacity even when other resources are made available (Commonwealth of Virginia 1998a, 1999e).

Figure 2. Relationship Between Local Medical Response and Response by Outside Resources


The outbound direction of flow addresses what to do with the patients that exceed system capacity. Theoretically, patients excess to the capacity of a local system may be directed to hospitals in neighboring jurisdictions. Data collected by the Virginia Office of Emergency Medical Services in 1998 suggested that some hospitals actually had mutual aid agreements with other facilities to take overflow patients in a disaster. Beyond that, the linkages become less well defined. For example, do states have arrangements to move patients regionally within the state? And how well will the
National Disaster Medical System manage patient flow using Disaster Medical Assistance Teams to staff airheads?

A SYSTEM

In 1988 a Governor’s Task Force on Emergency Medical Response Disaster Planning issued the first design for a disaster medical response system in Virginia. Subsequently, the Commonwealth’s capacity to provide an effective medical response in disasters has grown guided by both conscious planning and by the exploitation of opportunities and lessons provided by events. Although the result is an effective system (Figure 3), the result looks little like its original concepts, and has followed a circuitous developmental course marked by periods of quiescence and spurts of sustained activity.

For the purposes of this paper I will use system in the context it is normally used in the emergency medical services. Emergency medical services systems are typically collections of resources, including communications, emergency medical services agencies with vehicles and trained personnel, and hospital emergency and trauma services, governed by protocols and procedures and with a shared understanding of the need to work cooperatively to reduce mortality and morbidity (United States 1996a, Kuehl 1989). From a classic system model perspective, this is both one of the two key inputs and the central process – the other input being injured or ill people. The output is a patient that survives.

Figure 3. The Virginia Model

Note: Acronyms used include EMS for emergency medical services, EOC for emergency operations center, ESF-8 for Emergency Support Function 8 Health and Medical, and NDMS for National Disaster Medical System. Dashed lines indicate coordination; solid lines indicate operational movement of resources and patients.
Already Existing System Components

The medical component of disaster response in Virginia has been viewed, by long tradition, as the combination of pre-hospital emergency medical services system and the trauma centers and acute care hospitals. This is a robust system with extensive resources (see Table 1); for example, the prehospital care component consistently has ranked in the top six states in the country in ambulances and field providers (Total Number of Prehospital Providers 1999, Number of Ground/Air Ambulances 1999). However, the capability of the hospital component of the system to accept large numbers of patients has been steadily declining with facility closures and shrinking bed capacities (Green 2000a).

Table 1. Existing Medical Disaster System Resources in Virginia

<table>
<thead>
<tr>
<th>Emergency Medical Services</th>
<th>Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Medical Services</td>
<td>Trauma Centers</td>
</tr>
<tr>
<td>Agencies</td>
<td>Level I (24 hour capable)</td>
</tr>
<tr>
<td>Ambulances and Other Vehicles</td>
<td>Level II (not 24 hour capable)</td>
</tr>
<tr>
<td>Certified Providers</td>
<td>Level III (stabilization)</td>
</tr>
<tr>
<td></td>
<td>Other Acute Care Hospitals</td>
</tr>
<tr>
<td></td>
<td>Department of Veterans Affairs</td>
</tr>
<tr>
<td></td>
<td>Medical Centers</td>
</tr>
<tr>
<td></td>
<td>Military Hospitals</td>
</tr>
</tbody>
</table>

Notes: Certified providers include Paramedics and Emergency Medical Technicians at the Cardiac, Shock-Trauma, and Basic levels. Trauma centers provide specialist trauma care with varying levels of services. Acute Care Hospitals provide a 24 hour emergency department. Military hospitals listed are those with 24 hour emergency services.


In addition to this resource base, the 1988 report of the Governor’s Task Force spurred the development of disaster patient allocation procedures and command hospital roles in at least four of the state’s twelve emergency medical services regions and in one multi-regional cooperative based on hospital commercial alliances. The concept of facilities serving as command hospitals based on their roles as trauma centers and assuming responsibility for managing regional patient flows was key to this evolution.
Although the regional models differed in significant ways (see Table 2), they functioned well within the individual regions and were well accepted by both prehospital services and the hospitals themselves. How these models evolved was shaped by various forces including the dominance of a trauma center, the realities of regional communications coverage, and concerns over sharing proprietary data on patient counts.

Table 2. Regional System Models of Command Hospital Roles

<table>
<thead>
<tr>
<th>Command Hospital</th>
<th>Capacity Roll Calls</th>
<th>Patient Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma center serves as command hospital in natural disaster.</td>
<td>no</td>
<td>coordinates transfers to relieve overload</td>
</tr>
<tr>
<td>One trauma center always serves as command hospital.</td>
<td>only in mass casualty events</td>
<td>actively assigns patients</td>
</tr>
<tr>
<td>A trauma center serves as command hospital with an acute care hospital as backup.</td>
<td>routinely conducted</td>
<td>actively assigns patients</td>
</tr>
<tr>
<td>Nearest hospital to incident serves as command hospital.</td>
<td>routinely conducted</td>
<td>actively assigns patients</td>
</tr>
</tbody>
</table>

Although activation of command hospitals in the patient allocation role has been rare due to the paucity of mass casualty events, 2001 saw the validation of the system on a routine basis as the result of reduced bed capacities, disease outbreaks, and the closing of a key mental health facility in Richmond. When an influenza outbreak filled almost all of the Richmond hospitals, resulting in city-wide diversion of patients, mass casualty procedures were activated to increase capacity and allocate patients. This procedure is now institutionalized with the Richmond Ambulance Authority dispatch center tracking diversion status and the regional command hospital starting patient allocation procedures when system capacity is dangerously low. As a result mass casualty procedures are in use on a daily basis, increasing readiness for their use in a disaster event (Harris 2001, Vaughan 2001).

Development of State Capabilities

Experience in the Madison County flooding of 1995 convinced the staff of the Virginia Office of Emergency Medical Services that a more effective method of mobilizing resources was needed. Prior to that time the Office provided a representative to staff the state emergency operations center; however, outside of the administrative staff and regional inspectors of the Office, this individual had no resources for response. When a disaster struck, he or she would call individual agencies or the Chief Rescue
Officer of the Virginia Association of Volunteer Rescue Squads and attempt to mobilize individual ambulances and crews for statewide response. As a result, finding resources was a hit or miss process, there was no accountability for resources told to respond to the disaster site, no logistics support, and no way to tell local jurisdictions what was coming to help (Green 2000b).

In 1996 the Office took the first steps to organize permanent, regionally based units that were under the operational control of the Office and that could be managed in much the same way a county would manage its emergency medical services resources. In keeping with national standard incident command system terminology, these units were termed Task Forces because they consisted of a mix of different types of individual resources: an advanced life support ambulance, a basic life support ambulance, a rescue truck, and a quick response vehicle, with 12 personnel under the leadership of a Task Force Commander (Commonwealth of Virginia 1999c). The actual vehicles that respond vary by Task Force, with some task Forces also having the capability to bring logistics support trailers or mass casualty supply trailers. Today 12 Task Forces are operationally ready, with an eventual goal of 24 (Vaughan 2001).

Control of operational Task Forces in the field, along with the other wide range of disaster coordination responsibilities, had the potential to overload the single Office representative in the state Emergency Operations Center. To provide adequate workspace for a group of people to coordinate response, the Office of Emergency Medical Services constructed an ESF-8 Emergency Support Center in its facilities. Although this is a somewhat austere facility, its communications suite, computers with current emergency management software, and access to reference databases has proved crucial to manage responses.

In 1998 three Task Forces were deployed for the first time to southwest Virginia for a severe winter storm (Commonwealth of Virginia 1998a). Out of that experience came the realization that inadequate attention had been paid to how to manage these assets in the disaster area. Concepts already being taught in mass casualty incident management training courses provided the basis for a common approach. The mass casualty model taught includes the standard establishment of a Medical Group with a Group Supervisor and Extrication, Triage, Treatment, and Transportation Unit Leaders (Barbour, Brazzle, et. al. 2001b). The Medical Group structural model was familiar to Task Force members, and therefore the Office established Coordination Teams to act in the role of on-site Medical Group Supervisor. The mission of the Coordination Team included resource allocation, communications and reporting, and logistics support for the deployed Task Forces (Commonwealth of Virginia 1999d).

In 1999 flooding caused by Hurricane Floyd devastated the City of Franklin. This generated a full-scale deployment of eight Task Forces and both available Coordination Teams – the last Task Force resources were finally released after eight weeks of on-site duty. This response highlighted two critical management needs – more qualified coordinators on site and better use of the Internet to manage disaster information. Trained Coordination Team members were rapidly diverted from their normal duties to
helping the impacted jurisdiction manage its response. As a result, Coordination Team staffing has been increased from two to six (Commonwealth of Virginia 1999d). Because of the large number of deployed units, the staff of the Emergency Support Center spent a considerable amount of time answering general inquiries – for the first time ESF-8 information was distributed through The Virtual Emergency Operations Center, an Internet facility operated by members of the US Service Command, a National Voluntary Organizations Active in Disaster member agency.

The Franklin experience and subsequent deployments of critical incident stress management debriefers to North Carolina highlighted the need for deployable stress management teams to either accompany task forces or to meet out-of-state requests under the Emergency Management Assistance Compact. As a result, the Office of Emergency Medical Services developed a Critical Incident Stress Management Strike Team (Commonwealth of Virginia 1999b). Although Virginia has a robust Critical Incident Stress Management system with 18 regional teams, these regional units are not prepared for sustained deployments and lack the training and equipment for disaster site operations. This year an additional resource, a Massage Strike Team, has been added to increase the range of support services available to disaster responders.

Training

The Disaster Response Committee of the Governor’s Emergency Medical Services Advisory Board and the staff of the Office of Emergency Medical Services has developed a coordinated approach to disaster training for emergency medical services field providers based on a standard progression of courses. The first modules of this program were mass casualty based and were introduced in 1995. Today, the program includes Mass Casualty Incident Management, Terrorism, Emergency Medical Services Disaster Task Force, and Critical Incident Stress Management and Massage Strike Team training courses ranging in length from 1.5 hours to 8 hours.

In addition to training courses, the Office has developed an annual exercise program to test plans and procedures and to train personnel in disaster operations. Starting with tabletop MEDEX exercises in 1995 through 1997, the latest iteration was full scale deployment exercises for the Disaster Task Forces in 2000 and 2001.

Operationally, the Office of Emergency Medical Services can identify specific positive results from training. The clearest examples have occurred in deployments of the Disaster Task Forces. During the response to the flooding in Franklin, Virginia, after Hurricane Floyd, on numerous occasions over a five day period units of different Task Forces were assigned to work together or under the leadership of officers of yet a third Task Force and did so with no role confusion, no misunderstandings of terminology, and no difficulties in communications procedures (Commonwealth of Virginia 1999e). Although the situation was unusual (in that Task Forces normally maintain unit integrity), this outcome shows the effectiveness of uniform training to a set syllabus delivered by a small cadre of instructors to the same standard. Similarly effective teamwork was observed during exercise Bright Star 1999 in the operation of a National Disaster Medical
System airhead by members of units from Northern Virginia, the metropolitan Richmond area, and Tidewater.

Table 3. Virginia Disaster Training

<table>
<thead>
<tr>
<th>Level:</th>
<th>Mass Casualty:</th>
<th>Terrorism:</th>
<th>Disaster:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Module I</td>
<td>Module I</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Awareness</td>
<td>Awareness</td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>Module II</td>
<td>Module II</td>
<td>Task Force Member</td>
</tr>
<tr>
<td></td>
<td>Operations</td>
<td>Operations</td>
<td>CISM Strike Team Member</td>
</tr>
<tr>
<td>Supervisor</td>
<td>(Module III)</td>
<td>Clinical</td>
<td>Task Force Commander</td>
</tr>
<tr>
<td></td>
<td>(Module III)</td>
<td>(Module III)</td>
<td>(CISM Strike Team Commander)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Massage Strike Team Commander)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Coordination Team Commander)</td>
</tr>
<tr>
<td>Local Staff</td>
<td>(Module IV)</td>
<td>(Module IV)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Training courses in parentheses are currently under development or revision. CISM is the acronym for Critical Incident Stress Management.

Procedures

Along with standard training, standard procedures have emerged as a key component of effective response. This must be considered in the context of a state in which each of the twelve regional emergency medical services councils traditionally issued their own medical treatment protocols, with only general similarity between them. The first two documents, the Virginia Mass Casualty Incident Response Guide and the Virginia Mass Casualty Tactical Worksheet Book, are now in their third editions (Commonwealth of Virginia 2001c, 2001d).

Even more critical to disaster response has been the development of standard operating procedures for the Emergency Medical Services Disaster Task Forces and Critical Incident Stress Management and Massage Strike Teams (Commonwealth of
Virginia 1999b, 1999c). This has been an iterative process as lessons learned from exercises, actual disaster deployments, and even training courses have been incorporated in updated editions of the procedures. As a result standard operating procedures now cover the composition of each type of resource, supervisory relationships, recommended equipment, operational procedures for response, safety, personnel accountability, and mission tasking, reporting, and communications procedures.

Standard communications procedures have proved to be especially effective in managing the rapid alerting and deployment of large numbers of teams. By using standard templates for alerting, mission tasking, and reporting that include all required information (Commonwealth of Virginia 1999c), both staff at the emergency support center and team members can count on information being passed in the same way each time. Not only does this reduce the chance of accidental omission of critical information, but the use of a standard format makes transmission by voice or facsimile significantly faster than is the case with unformatted instructions. The same formats are used as the basis for displays in The Virtual Emergency Operations Center.

Identification of Catastrophic Casualty Procedures

The Task Force structure provides the state resources that can be deployed for major events to supplement local resources. As noted previously, the regional command hospital structure provides a method for patient allocation within a region. Exercises MEDEX 96 and MEDEX 97 highlighted the problems resulted from mass casualties that exceed regional capacity. From the lessons learned in MEDEX 97 emerged a Catastrophic Casualty Plan for efficient allocation of patients between regions in the immediate aftermath of an event that causes casualties far in excess of a region’s hospital capacity. The Catastrophic Casualty Plan provides the option for a region to either coordinate directly with an adjacent region for patient movement or to use the ESF-8 Emergency Support Center as a coordination point (Commonwealth of Virginia 1998b). Tests of regional coordination capabilities suggest that a Command Hospital would rapidly reach its coordination limits in dealing with allocation within its own region. The Emergency Support Center has the communications needed to not only arrange for patient allocation statewide but also to mobilize resources for transportation.

Integration with NDMS

The presence of a Department of Veterans Affairs Federal Coordinating Center at the Hunter Holmes McGuire Veterans Affairs Medical Center has proved to be a significant advantage in the development of an effective relationship with the National Disaster Medical System’s airlift and hospital components. Virginia is covered by three Federal Coordinating Centers, including McGuire, the U. S. Air Force hospital at Bolling Air Force Base, and the Portsmouth Naval Medical Center. Staff turnover, low interest in the National Disaster Medical System as one of many additional duties, and lack of incentives to integrate activities with the civilian disaster response system have made the military Federal Coordinating Centers unreliable and ineffective partners.
In contrast Veterans Affairs participation has included extensive state, local, and Federal Coordinating Center planning, resulting in the development of a mass casualty based plan for reception of incoming airlift patients. This plan was tested in 1999 in Bright Star 1999, a single aircraft airlift exercise at Chesterfield County Airport, and will be tested in October at JREX 2001, a two aircraft exercise. Each aircraft is treated as a mass casualty incident, and the airhead is prepared to receive patients using the standard organizational model of the Medical Group. The Emergency Medical Services Disaster Task Forces provide the staffing of the airhead. This assignment was based on the potential for extended airhead operation, a mission task for which the Task Force 72 hour model is well adapted. In addition, this assignment reduces the load on local emergency medical services agencies and allows them to manage their resources to handle the scheduled transports (Green 1999, Central Virginia National Disaster Medical System 2001).

Central to airhead mass casualty operations has been the adoption of common software for patient tracking among the regional Command Hospital, the Office of Emergency Medical Services, and the Federal Coordinating Center. TRANSAID is now used not only for National Disaster Medical System operations, but also as the standard major event patient tracking software for two emergency medical service regions.

**Formalization of Mutual Aid**

The initial efforts to develop mutual aid pacts resulted from the 1988 Governor’s Task Force report. However, there is no evidence that a mutual aid system developed, even briefly, from the pacts the report suggested. Experience suggests that the lack of funding and staffing to monitor mutual aid agreements doomed the effort. However, within the volunteer rescue squad community, the Virginia Association of Volunteer Rescue Squads did develop a regional mutual aid structure that called for the Association’s Districts to respond to assist other Districts. Experience in the 1995 Madison County flooding revealed significant shortfalls in this system’s ability to mobilize and track resources (Green 2000b), and, although the Association’s Disaster Manual (1993) remains a current document, activations of its provisions have been rare.

Starting in 1996, under the aegis of the State Fire Chiefs Association of Virginia and the Virginia Department of Emergency Services, a Statewide Mutual Aid Committee worked to develop a procedure for government-to-government mutual aid in Virginia (Slayton 1996). This effort was seen as primarily being applicable to large scale emergencies and disasters. By 2001 the resulting mutual aid system was finally operational with 92 participating jurisdictions, a team assigned to staff the state emergency operations center (Commonwealth of Virginia 2001a), and a published Implementation Guidebook (Commonwealth of Virginia 2001e).

The role of mutual aid in the established medical response system is uncertain. Because the Statewide Mutual Aid system uses a jurisdiction-to-jurisdiction agreement and potentially involves transfers of funds, it seems unlikely to be used for routine mutual aid. At the same time, the state Emergency Medical Services Disaster Task Force system
appears to be well enough established to provide a more reliable way of meeting needs in major events.

To Be Solved

Figure 3 illustrates a coordination intense process that has the potential to degrade rapidly in the event of communications failure. Experience in Hurricane Floyd demonstrated that reliance on cellular telephones, land-line telephones, and the community’s own amateur radio emergency communications was inadvisable (Commonwealth of Virginia 1999e). Currently the Office of Emergency Medical Services is exploring establishment of Communications Strike Teams with the Amateur Radio Emergency Services to support the Disaster Tasks Forces in the field (Wilson 2001).

The linkage between the state system and National Disaster Medical System Disaster Medical Assistance Teams is problematic at best (Green 2000a). Deployed Disaster Medical Assistance Teams have taken extended periods of time to achieve reasonable integration with local emergency medical services systems, even in preplanned events in Virginia (Vaughan 2001). This experience, combined with the failure of nearby Disaster Medical Assistance Teams to participate in exercises in Virginia when invited (Commonwealth of Virginia 1996), raises questions about their ability to effectively integrate into a complex system used to functioning without them in the midst of a major disaster.

The existence of a robust and generally effective training program for field disaster responders has not been translated into similar training programs for hospital staffs. This may result from a variety of factors including staff turnover, high staff workload with reduced availability for training, and lack of regulatory requirements or incentives for training. Although Joint Commission requirements generally mean that hospitals are at least as well prepared for disasters as their surrounding communities, the lack of a standard training program for hospital staffs remains a concern.

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