

WALSH CENTER FOR RURAL HEALTH ANALYSIS

**Understanding the Role of the Rural
Hospital Emergency Department in Responding to
Bioterrorist Attacks and Other Emergencies:
A Review of the Literature and Guide to the Issues**

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Understanding the Role of the Rural Hospital Emergency Department in Responding to Bioterrorist Attacks and Other Emergencies: A Review of the Literature and Guide to the Issues

A recent article in *The Washington Post*¹ described the preparations of Madison, Virginia (population 12,500) for a biological or other terrorist incident. Officials from Madison--located 90 miles from Washington, DC--have been preparing to provide for residents in case of an emergency but also are making ready for an influx of DC evacuees in the wake of an attack. They plan to have available close to 300 beds as well as emergency food supplies.

The evacuation of residents of large cities during a terrorist attack is just one of the scenarios that call for emergency preparedness on the part of rural communities. Not only does a significant proportion of the population reside in rural areas, rural communities are home to most of the nation's farms, numerous power facilities that could be used as weapons of mass destruction, agricultural chemical facilities, and US Air Force missile launch facilities.² One of the members of the Wyoming All-Hazards Response Team suggested that "(Terrorists) may be more likely to go to a rural area because they suspect folks are apathetic to the threat."³

A 2002 report prepared by the Office of Rural Health Policy notes that some states are farther along in their preparations for bioterrorism because of prior related experience—for example, Georgia because of preparations for the 1996 Olympics, Utah because of the 2002 Olympics, and New Mexico related to the Los Alamos fires and the Hanta Virus.⁴ However, the former two states' preparation for the Olympics was largely based in urban centers. The more recent anthrax scare, while concentrated in urban settings, caused false alarms and generated concern and fear well outside of urban centers. A report by the General Accounting Office examining bioterrorism preparedness discusses some of the lessons learned from having to respond to public questions and concerns about anthrax.⁵ Overall, as noted in the GAO report, "cities with more experience dealing with public health emergencies were generally better prepared for a bioterrorist attack than other cities." In contrast, an assessment of local health departments in Kansas found that "most rural health departments have neither the staffing nor the training to deal with serious communicable disease

¹ Pressley, Sue Ann "They'll Leave the Light On but Not for Long, Terrorism Evacuees Would Find Open Arms, Few Beds in Va. Town," *The Washington Post*, April 21, 2003

² Office of Rural Health Policy, *Rural Communities and Emergency Preparedness*, April 2002.

³ Connect Wyoming Newsletter, March 31, 2003, Volume 5, Issue 3, "Preparing for Bioterrorism in Wyoming," <http://wind.uwyo.edu/connect/newsletter.htm>

⁴ ORHP, April 2002.

⁵ US General Accounting Office. *Bioterrorism: Preparedness Varied across State and Local Jurisdictions*, GAO-03-373, April 2003, page 23.

outbreaks.” While the study was conducted before the advent of recent bioterrorism concerns, the findings have clear implications for future events.⁶

As communities across the country prepare for the range of terrorist events, it is critical to remember that many of the ways in which rural communities and their health care delivery systems differ from urban communities may affect their ability to prepare for or react in an emergency and will likely necessitate different strategies for preparation and response. Rural communities have smaller public health departments (if they have one at all), with less capacity and fewer resources, including electronic communication capabilities. Rural emergency medical services often rely on volunteers and are less likely to have a sufficient number of well-equipped ambulances and adequate life support equipment. There are likely to be fewer health care providers overall and, specifically, fewer specialists such as mental health professionals, infectious disease or burn care physicians. Hospitals are less likely to have surge capacity, because of their relatively small size and recent pressures to downsize. The paradigm of rural hospital emergency departments is often to stabilize and transfer, depending on larger facilities to provide a higher level of care.⁷ Rural communities are also located at greater distances from needed resources and these distances can delay assistance.⁸

While there has been a fair amount of study of local public health departments and their capabilities for responding to disasters, there has been relatively less focus on the role of hospitals in such events. This is, in part, because hospitals have historically been less involved in disasters, with infectious disease outbreaks left to public health departments and fire and rescue services taking care of other sorts of emergencies. The GAO report notes that hospitals were not viewed as part of the response team prior to September 11th, but that local governments and hospitals themselves soon realized that hospitals and hospital emergency departments (EDs), in particular, need to play a major role in these sorts of emergency situations.⁹ In a January 2000 editorial in the *Journal of the American Medical Association*, the Chair of the American College of Emergency Physicians’ Taskforce of Health Care and Emergency Services Professionals on Preparedness for Nuclear, Biological and Chemical Incidents notes that “there has been minimal involvement of health care facilities and health care professionals in WMD (weapons of mass destruction) preparedness programs”

⁶ Shepherd M and Ransom MV. “Capacity of Local Health Departments: Assessing Their Ability to Respond to Communicable Disease Threats,” Research Brief, Kansas Health Institute, June 2002.

⁷ Williams JM, Ehrlich PF, and Prescott JE. “Emergency medical care in rural America,” *Annals of Emergency Medicine*, Volume 38(3), September 2001, pp323-327.

⁸ This latter point from a presentation at the California State Rural Health Association’s workshop, “Demystifying Bioterrorism for Rural Health,” July 16, 2002.

⁹ GAO, page 26.

and that this represents a “serious flaw in US national strategy.”¹⁰ Hospital personnel are likely to be among the first responders and their ability to quickly assess a threat or an outbreak may save valuable response time. If medical treatment is required, hospitals will need to be involved in administering large-scale treatments. In a rural community, in particular, the hospital serves as a logical focal point for the community’s reaction to a bioterrorist event.

Because of the importance of the rural hospital in a bioterrorist incident, the Office of Rural Health Policy is interested in learning more about what rural hospitals are doing in terms of preparedness and the constraints they face in their efforts. To assist ORHP, we review some of the issues likely to affect hospitals, with a particular focus on rural hospitals--what is known about their level of readiness and the gaps that have been identified. We examine issues related to physical capacity, sufficiency of health personnel, preparedness plans, disease surveillance systems, and communication/coordination. In general, there is some evidence that coordination and communication systems are being addressed more fully than infrastructure and workforce issues, in part because the latter require more resources and involve more long-term efforts.¹¹

Concerns about funding cut across all of these issues of preparedness. There is particular concern in rural areas about how state funds are distributed to localities, and whether rural communities are overlooked in favor of metropolitan areas in this process.¹² While some believe that federal bioterrorism preparedness funding should be targeted to large regional hospitals, the chief of the medical staff at a 140-bed hospital in Tennessee points out that local residents “look to the local hospital for evaluation and treatment, not a hospital miles away.”¹³ There is also the more general issue of sustainability of funds. In order to plan effectively, communities need to know if they can rely on ongoing funding to maintain current levels of effort. While adequacy of funding is critical, it must also be emphasized that some issues cannot be addressed even with generous funding allocations. Local communities look to the federal government for technical assistance in terms of standards for preparedness and information on best practices.¹⁴

¹⁰ Waeckerle JF, MD. “Domestic Preparedness for Events Involving Weapons of Mass Destruction,” editorial, *Journal of the American Medical Association*, Vol.283, No.2, January 12, 2000.

¹¹ GAO, page 4.

¹² Despite this perception, a survey sponsored by National Association of Counties (NACo) and National Association of County and City Health Officials (NACCHO) found that a higher percentage of smaller jurisdictions (compared to larger jurisdictions) reported funding and assistance from states.

¹³ Jackson A. “Williamson Medical Center Bioterrorism Committee formed,” *The Review Appeal*, December 2, 2001.

¹⁴ GAO, page 5.

Capacity

There are several dimensions of capacity that need to be addressed in preparing for a potential bioterrorist event. The number and type of health personnel, the physical capacity of hospital treatment space, the availability of isolation and decontamination rooms, and the inventory of supplies are among the primary areas of concern.

Health personnel. It is likely that local physicians, emergency department personnel, and local public health practitioners will be the first responders to the release of a biological agent, either overt or covert. The GAO report notes that there are pervasive personnel shortages in public health departments, laboratories, and hospitals.¹⁵ Concerns have been expressed, in particular, that preparations for emergency situations divert staff from their routine work and that the usual health and public health functions are being imperiled. Of particular note with respect to rural hospitals and communities, in contrast to urban hospitals, physicians in rural emergency departments are more likely to be family physicians, rather than board-certified emergency physicians or even residency-trained in emergency medicine.¹⁶ There is additional concern that shortages exist with respect to epidemiologists, lab workers, ED doctors and nurses. A brief guide for rural hospitals developed by the AHA notes the particular constraints facing rural hospitals with respect to staffing for an emergency and recommends that rural hospitals “develop a community-wide concept of ‘reserve staff.’¹⁷ Reserve staff would include retired health personnel, persons in training for health professions, and others in the community who could be trained to assist in an emergency.

Training and education are crucial to fast, effective response to a terrorist attack. Researchers at the University of Alabama at Birmingham conducted a pilot program, partially sponsored by AHRQ, designed to educate clinicians to deal with potential bioterror weapons. The program tested a screensaver program linked to a web-based training module, and showed significant improvements in bioterror agent knowledge in ED personnel.¹⁸ This research further supports the CIMERC/Drexel panels’ recommendation that visual reminders be used for increased awareness,¹⁹ and also promotes an approach that allows rural personnel to obtain training without leaving their hospitals.

¹⁵ US General Accounting Office. Bioterrorism: Preparedness Varied across State and Local Jurisdictions, GAO-03-373, April 2003.

¹⁶ Williams JM, Ehrlich PF, and Prescott JE. “Emergency medical care in rural America,” *Annals of Emergency Medicine*, Volume 38(3), September 2001, pp323-327.

¹⁷ American Hospital Association Section for Small or Rural Hospitals. *Rural Hospital Disaster Readiness*, AHA Update, November 2001.

¹⁸ Filoromo, C, Macrina, D, et al. “An innovative approach to training hospital-based clinicians for bioterrorist attacks,” *American Journal of Infection Control*, 2003; 31, pp511-514.

¹⁹ Greenberg, MI and Hendrickson, RG. “Report of the CIMERC/Drexel University Emergency Department Terrorism Consensus Panel,” *Acad Emerg Med*, Volume 10(7), July 2003, p786.

Physical capacity and supplies. A review of the literature indicates that most rural hospitals are unprepared both in terms of space and resources for such an occurrence of a bioterrorist attack. One study cites the general shortage of both ICU beds and isolation rooms in hospitals.²⁰ A study of hospital readiness that included interviews with the ED director or ED nurse manager of 22 rural hospitals found that none had decontamination stations that could accommodate 10 to 15 people at once and only one had stockpiled medications.²¹

It is noted in the literature that hospitals, both rural and urban, must be prepared for the possibility that patients, in the event of an attack, will be arriving at the hospital via alternative means of transport (i.e., not by ambulance), will go to the hospital closest to the incident and that the hospital needs to be prepared to establish a single entry point and a decontamination team as best they can with only a few minutes notice.²² Experts make clear that hospitals, regardless of size and resources available, must have some sort of plan in the event of an attack. Inappropriate response by the medical community may worsen a chaotic and potentially devastating situation.²³

In general, many of the informational materials prepared to assist hospitals do not recognize the distinct nature of rural hospitals. In North Dakota, for example, part of state efforts are geared toward ensuring that small rural hospitals can handle a potential crush of patients, but the bioterrorism coordinator in that state has told federal officials "that some of them (referring to standards for hospitals) do not consider the rural nature of states like North Dakota."²⁴ The American Hospital Association has developed a preparedness checklist for hospitals that includes, among other supplies, three days worth of basic personal protective equipment and specified pharmaceuticals; emergency power; loud speaker; and an external decontamination facility capable of handling 50 victims per hour. While the delineation of items is likely to be useful for all hospitals, there are no specific guidelines based on hospital size.²⁵ At the same time, the AHA Section for Small or Rural Hospitals has developed some separate materials that offer more specific guidance. With respect to stockpiling pharmaceuticals, the AHA recommends that, while a 2-day supply of pharmaceuticals is adequate for rural hospitals located near transportation systems, a larger supply may be needed for more isolated facilities. In addition, rural hospitals should explore ways that they

²⁰ Amy Smithson and Leslie-Ann Levy, *Ataxia: The Chemical and Biological Terrorism Threat and the US Response* (Washington, DC: The Henry L. Stimson Center, October 2000), 242, 262-263.

²¹ Treat KN, Williams JM, Furbee PM, Manley WG, Russell FK, Stamper CD, "Hospital preparedness for weapons of mass destruction incidents: An initial assessment," *Annals of Emergency Medicine*, Vol. 38(5) Nov 2001 pp 562-565, Center for Rural Emergency Medicine.

²² Bradley RN. "Health care facility preparation for weapons of mass destruction," *Prehosp Emerg Care* 2000 Jul-Sep; 4(3):261-9.

²³ Richards CF, Burstein JL, Waeckerle JF, Hutson HR. "Emergency physicians and biological terrorism," *Ann Emerg Med* 1999 Aug; 34(2):183-90.

²⁴ North Dakota continues preparations for bioterrorism attack, Dec 2, 2002

²⁵ Schultz CH, Mothershead JL, Field M. "Bioterrorism preparedness I: The emergency department and the hospital." *Emerg Med Clin North Am* 2001 May; 20(2):437-55.

could obtain additional drugs and medical supplies in the event of a continued emergency situation. The CIMERC/Drexel University consensus panel concluded that hospital EDs ought not to be responsible for distribution of prophylactic treatments to asymptomatic patients, as this duty would unduly increase the burden on facilities. Due to CDC estimates that emergency reserves of medications could be available to a hospital within 12 hours, that panel also agreed that stockpiling antibiotics and vaccines, except those with particularly long shelf-lives, is an unnecessary step for most hospitals.²⁶ While the panel's recommendations appear to be broad-based, rural hospitals and the issue of geographic isolation are not specifically addressed.

Additional issues related to hospital/ED capacity include capabilities for off-site triage of patients as well as the provision of off-site acute care. State planners in Nebraska are identifying nursing homes and other buildings that could provide backup hospital beds, especially in rural areas.²⁷ Beyond the hospital, rural communities generally lack access to hazardous materials (HAZMAT) units and lack sufficient HAZMAT recognition capability and decontamination training.²⁸ A study of local public health agencies conducted by the National Association of City and County Health Officials found that 40 percent of large and small town public health agencies provide hazardous materials handling services compared to 60 percent of metropolitan public health agencies.²⁹

Hospital Preparedness Plans

One of the first steps in preparing for a bioterrorist event is the development of a preparedness plan. There is some evidence that rural communities are less likely to have developed such a plan—a study by the National Association of County and City Health Officers indicated that half of local public health agencies were somewhere in the middle or about halfway to where they should be in terms of preparedness. And findings from the ORHP survey of State Offices of Rural Health indicate that some states have developed statewide plans with no specific actions targeted to rural areas. The previously-mentioned survey of 22 rural hospitals³⁰ found that none of the respondents believed that their hospitals were prepared at all for either biological, chemical, or nuclear weapons incidents. None of the rural hospitals surveyed had conducted disaster drills specifically for WMD events. Another survey of hospitals found that one-third had a response plan for biological incidents and one-half had

²⁶ Greenberg, MI and Hendrickson, RG. "Report of the CIMERC/Drexel University Emergency Department Terrorism Consensus Panel," *Acad Emerg Med*, Volume 10(7), July 2003, pp786-787.

²⁷ Connolly, Ceci. "Nebraska on Mark in Biowar Defense," *The Washington Post*, October 27, 2002.

²⁸ ORHP, April 2002, pages 3-4.

²⁹ ORHP, page 4.

³⁰ Treat, Williams, et al.

prepared a plan for chemical incidents, with the likelihood of having a plan in place substantially greater in large metropolitan counties than in other counties.³¹

The Agency for Healthcare Research and Quality has funded development of the Bioterrorism Emergency Planning and Preparedness Questionnaire for Healthcare Facilities. It is a “checklist for assessing their (hospitals’) capacity to handle potential victims of bioterrorism attacks or for evaluating existing emergency plans.” Similar to the AHA checklist, it is not clear whether there are standards relative to size and location, or whether there is specific guidance relevant to small rural hospitals.³²

One piece of a hospital preparedness plan must be a strategy for transferring or evacuating patients in case of emergency or when a higher level of care is needed.³³ A post-earthquake evacuation of 8 hospitals in L.A. County resulted in a test of evacuation procedures and found that evacuation of large numbers of patients could be accomplished with the use of available resources and personnel. The analysis of the evacuation stresses that evacuation could be necessary due to other sudden disasters such as the use of explosive or biologic weapons. Considerations mentioned included possible lack of electricity, use of elevators, establishing a triage method for which patients go first, and a backup plan for providing care elsewhere if necessary. The authors mention the potential for establishing field hospitals or use alternative sites of care such as schools, sports facilities, or churches.³⁴

The National Bioterrorism Civilian Response Center (CIMERC) and Drexel University’s Emergency Department convened a consensus panel of experts to develop recommendations for hospital emergency departments (ED) to be “minimally prepared” for a bioterrorist event. The panel’s report, published in July, 2003, echoes the AHA’s guide for rural hospitals’ recommendation that hospitals keep ‘reserve staff,’ and expands on this concept, as well as providing additional guidelines. The panel concluded that hospitals should at least minimally train or educate all employees about weapons of mass destruction, and develop an emergency management plan, including means to quickly activate and train volunteers and non-ED hospital personnel to perform necessary tasks safely and effectively. The panel also recommended that each facility retain, either in-house or on-call, a group of experts with specific knowledge of potential terrorist weapons, including chemical, biological, and radiological.³⁵

³¹ Davis LM and Blanchard JC. “Are Local Health Responders Ready for Biological and Chemical Terrorism?” RAND Issue Paper, 2002.

³² <http://www.ahrq.gov/about/cpcr/bioterr.pdf>

³³ Holcomb JB

³⁴ Schultz CH, Koenig KL, and Lewis RJ. “Implications of Hospital Evacuation after the Northridge, California, Earthquake,” *New England Journal of Medicine* 348:14, April 3, 2003.

³⁵ Greenberg, MI and Hendrickson, RG. “Report of the CIMERC/Drexel University Emergency Department Terrorism Consensus Panel,” *Acad Emerg Med*, Volume 10(7), July 2003, p785.

Disease surveillance monitoring systems

In many instances, a bioterrorist attack may take place in a metropolitan area, placing rural hospitals in a largely reactive mode. However, rural hospitals and communities also need to be prepared to play a more active role in the detection of a bioterrorist incident by having in place a disease surveillance monitoring system. Surveillance systems can be either passive or active—passive systems rely on lab workers and hospital staff to report incidents or to convey data on illnesses to public health staff while active systems provide a mechanism for public health practitioners to solicit information. This mechanism often involves direct access to hospital records so that data are reviewed on a regular basis, leading to earlier recognition of a threat.

There is some literature about the importance of these types of surveillance programs in the event of an attack, emphasizing the benefits from a public health disease surveillance program that links local health care, emergency care, EMS, the CDC, local law enforcement, and the FBI.³⁶ Active surveillance systems, in particular, are useful in the event of a covert bioterrorist incident and may greatly speed discovery of such an action. A monitoring system that detects clusters of illness based on electronic records of ambulatory care encounters is currently operational in eastern Massachusetts.³⁷ Similarly, a syndromic surveillance system to identify large-scale bioterrorism events through hospitals EDs was implemented in New York following September 11th.³⁸ Another example of such a network surveillance system is the Rapid Syndrome Validation Project.³⁹ Through this program, physicians can enter information on patients exhibiting symptoms of an attack and are provided with early warning and response to emerging threats. And a recent report by the Institute of Medicine⁴⁰ suggests that the US needs a national electronic reporting system feeding data from major clinical laboratories to state health departments.

Despite this widespread support for surveillance systems, in the ORHP survey, 22 of 32 respondents reported that their local public health departments did not have adequate surveillance capacity and only five respondents thought their state had adequate capacity. Many of the published articles on these surveillance systems fail to account for the participation requirements of rural

³⁶ Flowers LK, Mothershead JL, and Blackwell TH. "Bioterrorism preparedness II: The community and emergency medical services systems," *Emerg Med Clin North Am* 2002 May; 20(2):457-76.

³⁷ Lazarus R, Kleinman K, Dashevsky I, Adams C, Kludt P, DeMaria A Jr, Platt R. "Use of automated ambulatory care encounter records for detection of acute illness clusters, including potential bioterrorism events," *Emerg Infect Dis* 2002 Aug; 8(8):753-60.

³⁸ "Syndromic surveillance for bioterrorism following the attacks on the World Trade Center—New York City, 2001," *MMWR Morb Mortal Wkly Rep* 2002 Sep 11; 51 Spec No:13-5.

³⁹ Zelicoff A, Brillman J, Forslund DW, George JE, Zink S, Koenig S, Staab T, Simpson G, Umland E, and Bersell K., Salerno RM. "The Rapid Syndrome Validation Project (RSVP)," SAND No. 2001-2754J, August 2001, Sandia National Laboratory, Albuquerque, NM.

⁴⁰ Institute of Medicine. *Microbial Threats to Health: Emergence, Detection, and Response*, March 2003.

hospitals. One obstacle to putting an active surveillance system into place in a rural community may be the absence of an epidemiologist; a smaller, more isolated community may need to rely on state epidemiologists to review the surveillance system information and determine when to initiate an investigation.⁴¹ Such delays may exacerbate and prolong an incident.

Laboratories. If a surveillance system is effective and a biologic agent is suspected, then specialized laboratory facilities become critical, as demonstrated during the recent anthrax scare. The GAO study reported that state labs were quickly over-run during the anthrax scare, and had to rely on CDC and federal labs. There is currently no general arrangement for private labs to provide backup for public health labs. Hospital labs are unlikely to be equipped for testing in the event of a biological incident so that hospitals would need to have arrangements with public or private labs to send samples out to be tested. In addition to the serious limitations on capacity in the labs themselves, the number of staff trained to complete the necessary tests has been found to be inadequate.⁴² While the shortage of adequate testing facilities and personnel are likely to apply to urban areas as well as rural, it may be that the types of solutions needed differ. These issues are not well addressed in the literature. It is likely, however, that entering into agreements with nearby regional or state facilities would be more feasible for rural areas than would be expanding current on-site capabilities by training additional staff and purchasing new equipment.

Communication and Coordination

Coordination among different players is critical in a state of emergency. Coordination must be both vertical (between different levels of government, e.g., local communities and the state) and horizontal (between the hospital, local public health officials, and local physicians among others). And coordination among all of these different entities relies not only on planning prior to the crisis but on the ability to communicate during the crisis. As noted earlier, the GAO report notes “much greater progress in coordination and communication preparedness than in other elements of preparedness.”⁴³

Horizontal coordination. As reported in much of the literature related to emergency preparedness, hospitals have been late in joining coordinated planning efforts. In earlier emergencies, hospitals were not viewed as part of the system; however, since September 11th that perception has changed and hospitals are becoming more integrated into planning networks. Within these planning networks, the relationship between local/rural hospitals and public health entities and officials permeates much of the literature. Various authors advocate the development of local and state plans to enable hospitals and

⁴¹ GAO, page 24

⁴² Alliance for Health Reform. “Bioterrorism & Public Health Funding: Current Threats and Proposed Responses,” December 2002.

⁴³ GAO, page 14.

emergency physicians to work efficiently with public health, emergency response, and law enforcement communities.⁴⁴

A number of recent efforts illustrate the increased involvement of hospitals in preparedness networks as well as the distance that remains in terms of the inclusion of hospitals. A survey of West Virginia county health directors found that hospitals were not well integrated into preparedness efforts: only 20 of 44 respondents to the survey had provided contact information to hospitals and only 20 percent had contact information for hospitals. Along the same vein, only 14 percent of training activities involved hospitals; two-thirds of county health directors had no protocol for communicating with hospitals, and, overall, respondents reported weak relationships with area hospitals.⁴⁵ The Indiana EPICS program is one example of a coordinated network among local provider groups that includes a hospital. Specifically, the Indiana EPICS program (Emergency Preparedness: Integrated Community Solutions)--developed by Orange County, Indiana and the state of Indiana—enables the electronic transmission of health care records and advanced telemedicine applications between a 28-bed hospital and four rural clinics.⁴⁶

The GAO report also notes improved coordination among local players—including fire departments, emergency medical services, law enforcement, public health officials, and hospitals—spurred at least in part by the events of September 11th and the subsequent anthrax scare. The GAO report⁴⁷ also mentions the need for coordination among hospitals in the same geographic area.

Vertical Coordination. In addition to contact with local officials, hospitals have also been working with state and federal agencies to prepare for possible attacks. An editorial in the *New England Journal of Medicine* emphasizes that hospitals “must now learn to function as coordinated components of a regional response to crises.”⁴⁸ The Rapid Syndrome Validation Project (RSVP) described above is an example of the potential for collaboration between local providers, regional providers, epidemiologists and state health. The program involves local physicians, two national laboratories, a state university department of emergency medicine, and the state department of health. RSVP is being pilot tested in New Mexico; we are not aware of any specific discussion of its applicability in rural

⁴⁴ For example, see Gallo RJ and Campbell D. “Bioterrorism: challenges and opportunities for local health departments,” *Journal of Public Health Manag Pract* 2000 Jul;6(4):57-62.

⁴⁵ Hoard ML, Williams JM, Helmkamp JC, Furbee PM, Manley WG, Russell FK. Preparing at the local level for events involving weapons of mass destruction. *Emerg Infect Dis* 2002 Sep; 8. Available from: www.cdc.gov/ncidod/EID/vol8no9/01-0520.htm

⁴⁶ www.ihets.org/learn/tech/publications/infostream/spr2000-1;
www.in.gov/isdh/publications/llo/emergency_preparedness

⁴⁷ GAO, page 26.

⁴⁸ The editorial was responding to the Schultz et al. article about the multi-hospital evacuation following an earthquake. Berman MA and Lazar EJ. “Hospital Emergency Preparedness—Lessons Learned since Northridge” *The New England Journal of Medicine* 348;14, April 3, 2003.

areas. A similar program based in a rural area is EPICS, which facilitates both horizontal and vertical coordination. It electronically connects five rural health and 19 public safety agencies in Orange County (county population 19,442) so that they can coordinate planning and preparedness for emergencies, including incidents involving bioterrorism. In addition, the Access Indiana State Network allows communication with state health and emergency management officials.

In Nebraska, state planners and some counties have agreements with private trucking companies to deliver supplies to five hubs and over 25 small towns across the state in the event of an emergency.⁴⁹ Another aspect of coordination across local governments and providers is the inclusion of Tribal Nations. There is little information in the literature about the distinct needs and requirements of American Indians living on reservations and the separate governments that need to be involved in planning efforts. In Nebraska, the state's chief medical officer convened a meeting about small pox and included representatives of Indian tribes. A description of the meeting also mentioned the importance of overcoming cultural barriers in planning, with respect to groups including Hispanics, Vietnamese, and American Indians.

In many states, vertical linkages have been established between local and state governments, but the GAO found in their site visits that "planning between states lagged."⁵⁰ They found that many states do not have agreements with neighboring states to share information, personnel, or equipment (e.g., backup laboratory capacity). Another coordination issue in which there has been insufficient progress has to do with border states and their relationships with Mexico and Canada.

Communication. Although a vast array of information on bioterrorism is now found on state health department websites, further steps need to be taken to inform and assist physicians and EDs if they are faced with an attack. In terms of communication strategies, lessons from the anthrax scare brought home the message of the need for good, rapid two-way communication. As noted in the GAO report, "in one rural state, which had no confirmed anthrax cases but numerous false alarms, the state public health department faxed messages containing critical information to hospitals throughout the state. Officials in the department realized that this one-way system was insufficient because they also needed to be able to receive communications rapidly."⁵¹ These officials then set up a 24-hour toll-free telephone number staffed by officials who could respond to questions from hospitals. In another state, the Internet connections of one of the local facilities were not good enough to receive files from the CDC and the only way to ensure that the files were received was to drive them there. Findings from a study conducted by NACCHO indicate that nearly 20 percent of local public

⁴⁹ *Washington Post* article "Nebraska on Mark in Biowar Defense," October 27, 2002, by Ceci Connolly

⁵⁰ GAO, page 25-27.

⁵¹ GAO, page 23.

health departments do not have Internet access and at least 10 percent do not have access to e-mail.

On a more positive note, in the survey of 22 rural hospitals, all were found to have established some sort of communications network, with private telephone lines and radios for use during disaster management, though facilities remained concerned about communication-related security issues.⁵² A study of rural health departments in Illinois explored the ability of local public health personnel to successfully use Internet and Intranet to gain access to scientific knowledge and disseminate the information to local residents. That study found that rural health departments used Internet-based databases from the National Library of Medicine to disseminate information on bioterrorism to local residents and that physicians helped in serving as intermediaries between health departments and residents.⁵³

At all levels of the health care delivery system, there is increased discussion of communication systems, including pagers, 24-hour phone numbers, broadcast capacity, and high-speed Internet connectivity. A program funded by the CDC--the nationwide Health Alert Network (HAN)—is intended to establish infrastructure at the local level so that information can be transmitted during a bioterrorism incident. The report indicates that some states have not covered 90 percent of their population as directed by the CDC. While the report doesn't specifically mention rural areas, it would not be unexpected to learn that rural areas were the ones not yet covered. Another communications program is a three-month pilot test of PDA network to transmit urgent information about biological agents to clinicians, sponsored by the Agency for Healthcare Research and Quality.

The *NEJM* editorial about the hospital evacuation noted that communications relied heavily on land-line telephone and cellular service. However, the authors note that experience from 9/11 suggests that this sort of reliance may not be possible, that regular telephone service may be disrupted, and that 'redundant' systems or alternative modes of communication may be necessary. They describe a partnership with the New York State Department of Health that successfully piloted a web-based password-secured system for crisis communication. Once the system was tested, the design was refined and an enhanced statewide system was implemented, with over 60 institutions participating. The system included internal institutional inventory and electronic

⁵² Treat KN, Williams JM, Furbee PM, et al. Hospital Preparedness for Weapons of Mass Destruction Incidents: An Initial Assessment. *Annals of Emergency Medicine*. 2001;38(5):562-565.

⁵³ Barshook PG, Kenny S, York J, Edison M, Buckley C, Sandlow LJ. "Internet Use by Rural Public Health Departments in Illinois in Response to Inquiries about Bioterrorism."

submission of data to simulated regional emergency operations center, included hospital blood banks and pharmacies.

Related Work by the Walsh Center

In the fall of 2003, the NORC Walsh Center for Rural Health Analysis convened a half-day panel meeting of seven representatives of rural hospitals who played a key role at their hospital in bioterrorism planning. The panelists were selected to represent (i) a broad range of states across the U.S. (NY, WV, PA, SD, KS, NE, and MN); (ii) hospitals of different sizes (ranging from a 6-bed Critical Access Hospital to a 350-bed hospital); (iii) varying levels of geographic isolation (one hospital is 125 miles from a city of 14,000 while another is near a city of 75,000 residents); and (iv) special features (one hospital is located near the border of two states and the US-Canada border). Within their hospital, representatives had widely varying job positions—in one of the smaller hospitals, the CEO was in charge of preparedness, while other representatives included the infection control nurse or the facilities coordinator in one of the larger hospitals. We also included one representative of a state office of rural health and a HRSA Bioterrorism Hospital Preparedness coordinator. The findings of the panel discussion are synthesized in a Walsh Center Policy Analysis Brief **“Perspectives of Rural Hospitals on Bioterrorism Preparedness Planning”** available at <http://www.norc.org/issues/health6.asp> or by contacting the Walsh Center at 301-951-5070.