

Bioterrorism: Are We Prepared?

Executive Summary

For two years, Gerald Blackburn, D.O., an infectious-disease specialist at Scottsdale Institute-member Botsford General Hospital in Farmington, Mich., has worried about the threat of bioterrorism, taking his concerns about huge security gaps to state officials and the physician community. The response was underwhelming.

“Everyone thought I was on another planet,” he says.

Since September 11, however, Blackburn has had to rewrite his entire talk. “It’s no longer about trying to get attention,” but what steps need to be taken, he says. “If there’s any good to come of 9-11 and the anthrax attacks, it’s that additional lives can be saved because of increased awareness.”

It’s safe to assume that all of us in the last three months have had to, metaphorically speaking, “rewrite” our own scripts. This issue of *Information Edge* tries to help in that effort by exploring the nature of the bioterrorist threat and the steps hospitals and health systems can take to better prepare for it. In addition to Blackburn, we interview experts from Scottsdale Institute members Advocate Health Care in Oak Brook, Ill., and CHRISTUS Health in Dallas, as well as the chief of emergency medical services for the Illinois Department of Public Health, an emergency preparedness consultant in the Twin Cities and a senior VP at the American Hospital Association.

It’s clear that bioterrorism is not a hospital or health-system issue alone, but one that requires a coordinated community response. In that sense, how prepared you are depends on where you live. Some states like Illinois have established well-delineated lines of communication, authority and accountability with clear roles for hospitals and other players. Nevertheless, everyone agrees a disease like smallpox that escalates among a population can overwhelm even the most prepared system. The best solution is early recognition, vaccination if available, quarantine if necessary and treatment if possible. How many resources we’ll have in the form of vaccines, medications, beds, supplies and trained personnel however, depends on how quickly we can rewrite our script as a national health system.



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Welcome New Member

Carle Foundation and Clinic

Scottsdale Institute is proud to welcome its newest member, Carle Foundation and Clinic, in Urbana, Illinois, which includes Foundation Hospital, a 295-bed tertiary care facility, Carle Heart Center and Carle Cancer Center. Carle serves as the primary teaching hospital for the University of Illinois College of Medicine. The Carle Foundation works in collaboration with Carle Clinic Association, one of the largest private physician groups in the country.

Welcome to Carle Foundation President and CEO James Leonard, MD, Executive Vice President and COO John Snyder, Vice President – Finance Charles Wilhelm, Carle Foundation and Clinic CIO Tom Ream, Vice President – Medical Affairs Napoleon Knight, MD, Carle Clinic Chief Executive Officer Bruce Wellman, MD, Chief Administrative Officer Michael Bukosky, Senior Vice President and CFO Robert Hendrickson and the entire Carle Foundation and Carle Clinic team.

The good news

Despite statements by federal officials that government and public health departments are prepared for bioterrorism, “Most physicians don’t buy that,” Blackburn says.

“The best news so far is that anthrax is not contagious,” he says. “Compared to what could happen, the mailing of anthrax is a relatively small and inefficient attack. It hasn’t been effective in making people ill. It’s the equivalent of the World Trade Center bombing in 1993.” When that didn’t work, he says, the terrorists ratcheted up their efforts with the deadly commercial jetliner attack. The same might be said of the anthrax terrorists: it could presage a more deadly attack possibly involving smallpox or some other agent and a larger population.

Today, the health system is aware that it’s vulnerable: there remain huge gaps in security and preparedness, especially in terms of communication between public health and practicing physicians.

“Public health is way understaffed, that’s a huge issue. There’s no surge capacity left. Every winter hospitals are filled to the brink. That delays diagnosis even later. Most hospitals have no room. We’re short nursing staff, ventilators and beds. There’s no easy solution. I’m not aware of any quick fix in sight,” says Blackburn.

‘Bare to the bone’

The biggest potential problem: the volume of patients versus the number of facilities, especially given a likely influenza pandemic expected to occur in the next two years. Since killing thousands in 1918, Spanish flu has swept the world with new fury every 20 years as the virus mutates and people lose their immunity. In terms of resources to face even that threat, let alone a bioterrorist attack, “We’re bare to the bone,” says Blackburn.

“We have no surge capacity even for a bad flu season, let alone for an influenza pandemic or bioterrorist attack. What we’ve seen with anthrax is the amount of time it takes the public health authorities to respond. Keep in mind this is a non-contagious, inefficient attack. In the big picture, this is small stuff.”

Besides education, a critical issue is the lack of benefits for families of healthcare workers who die caring for bioterrorist victims. That’s in contrast to the World Trade Center tragedy, in which families of police and firemen killed reportedly received \$150,000 each. “Physicians and other healthcare workers know nothing about putting themselves at risk except for TB, HIV and Hepatitis A and B, which have a low likelihood of contagion. You bring in plague and it’s a different story,” says Blackburn.

That scenario is especially true of healthcare workers making \$15 an hour who may also have children at home. It’s important to guarantee to healthcare workers who might die in the line of duty that their families will be taken care of. “We’re not talking about doctors, but nurses, respiratory therapists, janitors and food-service workers. I’m skeptical about everybody,” he says, because most of them are working because they are counted on to take

care of their families. “We need the equivalent of federal disaster insurance for healthcare workers.”

Rationing?

Ultimately, the number of ER beds depends on the particular threat and its severity. With inhaled anthrax, for example, once a person is ill there’s an 80% to 90% mortality rate within a month. Once people have been exposed, they need to start antibiotics before they’re ill. And anyone who comes into the ER and says they were in the area when an anthrax event occurred would expect to get treatment. “I predict there will be hoarding. I dare you to find Cipro. Whose got it? We don’t have 10 days of antibiotics. You’re talking 60 days for a family of four. Who’s going to pay for it?” asks Blackburn.

Compounding the problem is the fact that there’s no incentive for pharmacies to have large stockpiles of any drug. “If I’m in the ER, I can write a prescription, but who’s going to fill it? And how do I know you live in the area? Given an 80% to 90% mortality rate, should those already sick be given the antibiotics stored in the hospital pharmacy?”

“I see rationing of medications,” says Blackburn, asking, “What about the attorney who represents the families of patients who died who didn’t get treated because you as a physician decided other patients were better candidates?”

In many states it’s not clear who’s in charge. Is it the FBI, the governor, public health? Defining the chain of command and establishing effective communication among all people is a critical need. Hospitals will have to work as a system of providers. “Here every hospital is its own little island. We might tell the hospital down the street we’ve seen three unusual cases but not the one across town,” says Blackburn.

That’s the good news.

The bad news

Consider smallpox, a highly contagious disease with 30% mortality. No one since 1977 has received the vaccine. Therefore, there’s no immunity and those people who have received smallpox vaccinations before that point can’t be guaranteed their immunity is strong enough.

The scenario: an untreatable, highly contagious disease introduced into a country and everyone is susceptible. The rules have changed since September 11. What’s to stop 19 people from exposing themselves to the disease and, during a 14-day incubation period, wandering through public places and exposing a concentrated population?

Says Blackburn, “The healthcare system will shut down. What do you do with all these patients coming into the ER? Who’s there to greet them and treat the healthcare workers who are exposed? The scenario with smallpox is so bad, we’ve got to prevent it from happening. Fortunately, the federal government has been able to successfully dilute its stockpile of smallpox vaccine to create from 35 million to 95 million doses. But who gets the vaccine should be decided before an event occurs. Healthcare workers should be among the first.”

Dark Winter

On June 22-23, 2001, the Johns Hopkins Center for Civilian Biodefense Studies in conjunction with The Center for Strategic and International Studies, The ANSER Institute for Homeland Security and the Oklahoma National Memorial Institute for the Prevention of Terrorism, conducted an exercise focused around a hypothetical, covert smallpox attack in the United States. It was called Dark Winter and involved a series of mock National Security Council (NSC) meetings in response to the threat. The exercise, which simulated a time span of two weeks, quickly escalated from 20 confirmed smallpox cases in Oklahoma to 16,000 cases in 25 states with 1,000 deaths. It predicted another 300,000 cases within three weeks with one third to die. The Johns Hopkins Center synthesized the following lessons from the exercise:

Lessons of Dark Winter

1. *Leaders are unfamiliar with the character of bioterrorist attacks, available policy options and their consequences.*

- The consequences of a bioterrorist attack would differ substantially from the terrorist events of Sept. 11, 2001.
- Senior decision-makers in Dark Winter were largely unfamiliar with the sequence of events that would follow bioterrorist events.

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The list of negatives associated with smallpox goes on and on: As an airborne virus, smallpox is a threat even in intensive care—and the country lacks enough isolation rooms for the demand expected should smallpox walk in the door.

Unusual microbes

For years, hospitals have had disaster preparedness or “weapons of mass destruction” plans, but by and large they have focused on two areas: explosives and chemical attacks, says Dr. Terry Siebert, medical director at CHRISTUS Health and a practicing epidemiologist at St. Joseph Hospital, Houston.

“There was some interest in bioterrorism, but until recently it was always relegated to a third tier.” Since the anthrax attacks, most hospitals and health systems are working hard to bring their biologic preparedness up to par—but they still have a long way to go to make it as good as explosives and chemicals, he says.

In Houston, the effort has taken the form of a community initiative involving the City of Houston Health Department, the city microbiology laboratory, the fire department, local hospitals and the public health service.

“Organisms of bioterrorism must be identified—and a lot of hospitals can’t do that because those organisms tend to be unusual microbes,” says Siebert. A hospital microbiology lab can “presumptively” identify the culprit—determine the likelihood that it’s anthrax or another agent—within 24 to 48 hours. Confirming that information and conducting molecular typing for the FBI means biologic agents must be sent to the Centers for Disease Control (CDC) in Atlanta. That’s not to say that most health providers won’t have identified a patient’s symptoms enough to begin treatment early on.

‘The Big Seven’

Chemical attacks and explosions typically are blatant events that cause lots of damage, become public almost instantly and lend themselves to chain-of-command responses. In Houston, for example, the city’s fire department and emergency medical services assume command in such events.

In contrast, bioterrorism can be covert and unfold slowly. “A community physician will probably see these agents first. It’s not going to be obvious, but will be a case here, a case there. These situations don’t lend themselves well to a chain of command,” says Siebert.

Doctors and nurses, the “front-line providers,” will be the first to recognize the attack. However, chain of command and lines of communication become murky soon thereafter. “The City of Houston is developing a plan. We need to spend a lot of time with the front line educating them on what these diseases look like.”

Those diseases make up “The Big Seven” of bioterrorism: anthrax, smallpox, plague, botulism, tularemia, ebola virus group and Lassa fever, the last two considered hemorrhagic fevers. Each has a presenting feature; some are

Dark Winter continued

- Key decisions and their implications were dependent on public health strategies and the possible mechanisms to care for large numbers of sick people—issues not typically briefed or studied in the national security or defense community.

2. Following a bioterrorist attack, leaders’ key decisions would depend on data and expertise from medical and public health sectors.

- In Dark Winter, even after the smallpox attack was recognized, decision-makers were confronted with many uncertainties and wanted information that was not immediately available. (In fact, they were given more information on locations and numbers of infected persons than would likely be available in reality.)
- For example, it was difficult to identify the locations of the original attacks; know how many persons were exposed; find out how many were hospitalized and where; or keep track of how many had been vaccinated.
- This lack of information reflects the fact that few systems exist for rapid flow of this type of information in the medical and public health sectors in the U.S.

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distinctive, some not. “Most physicians have never seen a case of any of these. It will be a brand-new experience for most,” Siebert says.

Complicated and expensive

St. Joseph Hospital’s strategy includes providing continuing medical education courses, talks at staff meetings and videoconferences for physicians. In addition to educating the front line on how to identify The Big Seven, Siebert says healthcare organizations need to develop disease-specific coordinating strategies. Some of these agents—not anthrax—are transmissible from person to person. Plans should include:

- isolation of these patients
- quarantine
- treatment
- adequate supplies of caps, gowns, gloves
- plans for antibiotics

“It’s very complicated,” says Siebert, who chairs a St. Joseph committee representing 10 disciplines including pharmacy, infectious diseases, risk management and ER. The group oversees the hospital’s response to bioterrorism and works with a three-hospital regional committee that cooperates with the City of Houston Health Department and Office of Emergency Services. All the committees work in conjunction with the City of Houston. Most big cities have similar arrangements.

Emergency preparedness can cost a lot considering the need for such big-ticket items as decontamination centers with special equipment. “That sort of thing can be expensive. Not all hospitals can afford it,” says Siebert. The City of Houston is trying to offset such costs through federal and private grants.

St. Joseph Hospital, which participates in a Houston-area disaster-response effort with the Houston Fire Department and the city’s office of emergency management, is one of 10 Houston-area hospitals (out of about 60 total) designated as a “receiving” hospital in case of an explosion or chemical disaster where thousands of people might be hurt.

Another order of magnitude

However, that’s unlikely to be the scenario with bioterrorism, which results in scattered cases, increasing in number over time. Siebert says a massive bioterrorist attack on an urban population is improbable because of the complexity of the undertaking. “It requires another order of magnitude of sophistication compared to sending anthrax in envelopes. In 1993 the Aum Shinrikyo cult in Japan failed several times to drop anthrax on Tokyo. No one got sick. That’s why they turned to nerve gas in the subway.”

And while Iraq may have the ability to load anthrax on missile warheads, that doesn’t present much of a risk to this country because of their missiles’ limited range, he asserts.

That’s fortunate because, in the event of such a widespread attack, it’s unlikely the country would have enough supplies.

Dark Winter continued

3. The lack of sufficient vaccine or drugs to prevent the spread of disease severely limited management options.

- In Dark Winter, smallpox vaccine shortages had significant impact on the response available to contain the epidemic, as well as the ability of political leaders to offer reassurance to the American people.
- Emergency (crash) vaccine production strategies were untested and uncertain. Populations in affected states were frantic to get vaccine, while populations in unaffected states were worried that no vaccine would be left by the time the epidemic spread to their communities.
- The increasing scarcity of smallpox vaccine led to violence and flight by persons desperate to get vaccinated, and it had great impact on the decisions taken by political leaders.

4. The U.S healthcare system lacks the surge capacity to deal with mass casualties.

- In Dark Winter, hospital systems across the country were flooded with demands for patient care. The demand was highest in the cities and states directly attacked, but victims were geographically dispersed, with some having traveled far from the original site of attack.

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Siebert estimates that each hospital requires \$200,000 to \$300,000 in extra supplies, including antibiotics, to prepare for all types of weapons of mass destruction. But it's impossible to protect an entire population. "Stocking 60 days of Cipro for three million people in Houston is an impossibility. We have an arbitrary amount—300 doses at each hospital. But anthrax is treatable with other drugs like doxycycline and we have those as well."

The biggest obstacle to dealing with bioterrorism is early recognition and appropriate handling of patients, including proper containment. That means different things for different biological agents. "The big question is education. It's critical in bioterrorism."

Who ya gonna call? The humane society.

Blackburn says the country needs to take several steps:

- Take a serious look at all glitches in communication and line of authority and evaluate how severe they are. For example, whom do you call if you diagnose anthrax? In Ohio it was the humane society. Is there a 24-hour, seven-days-a-week telephone number and do doctors know what it is?
- Rebuild public health and build a chain of command, establishing real-time communication capabilities among all players.
- Rebuild our surge capacity by adding hospital beds or alternatives.
- Address the nursing shortage.
- Assure that healthcare workers will be adequately immunized and have adequate protective gear.
- Assure healthcare workers that their families will be taken care of if they die in the line of duty.

All local

Some experts are more sanguine about the healthcare industry's preparedness for a bioterrorist attack.

Ed Lord, an emergency-preparedness consultant with Minneapolis-based Salus International, says communities like the Twin Cities have been conducting antiterrorism exercises since the early 1990s. With \$1.2 million in funding from the CDC, local emergency management, hospitals and state health officials formed a joint bioterrorism committee which has conducted exercises to prepare for events like an attack with the toxin causing botulism.

However, some national priorities need to be changed, Lord asserts. The bulk of antiterrorism funding mistakenly goes to the federal sector instead of the local sector where it belongs. "This is backward. The response to September 11 was all local—New York and Northern Virginia. Federal response doesn't kick in until the local resources are overwhelmed," he says.

The first priority is to establish a joint-coordination effort ahead of time. "The worst place to meet for the first time is at the disaster," says Lord. A second priority is to appoint a strong community leader to bring in all the players.

Dark Winter continued

- The numbers of people flooding into hospitals across the country included people with common illnesses who feared they had smallpox, as well as the "worried well."
- The challenges of distinguishing the sick from the well, of rationing scarce resources, and of shortages of healthcare staff worried about becoming infected or about bringing infection home to their families all imposed a huge burden on the medical system.

5. To end a disease outbreak after a bioterrorist attack, decision-makers will require ongoing expert advice from senior public health and medical leaders.

- The leaders in Dark Winter were confronted with rapidly dwindling supplies of smallpox vaccine and an expanding smallpox epidemic. Some advised imposition of geographic quarantines around affected areas, but the implications of these measures, e.g., cessation of normal flows of medicines, food and energy supplies, and other critical needs, were not clearly understood at first.
- In the end, it is not clear that such draconian measures would have led to more effective interruption of disease spread.

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All clear in Chicago

Minneapolis isn't the only metropolitan area that boasts a well-integrated disaster organization.

"The Chicago area is fortunate that we have a very well developed emergency-response system," says Dan Parker, VP of public relations for Advocate Health Care. Indeed, Advocate hospitals comprise four of the eight Level 1 trauma centers in the Chicago area and two of the "pod" hospitals or coordinating facilities for other hospitals.

The Illinois Department of Public Health (IDPH) oversees response with a clearly established protocol. "If we had an anthrax attack, IDPH would direct the appropriate response and coordinate the supply of antibiotics with the federal government. The state knows how to work with Washington and does a good job of working with local organizations. We're all clear about that," says Parker.

As new things are learned about bioterrorist threats all players are trying to keep up. "There's a learning curve for everybody. We're in pretty good shape but we're hoping that it's not necessary to engage," he says. Advocate has its own infectious-disease and weapons-of-mass-destruction experts on internal committees which provide representatives to state-sponsored groups.

But internal communication is essential. With 25,000 employees and 5,000 physicians, educating caregivers on diagnosis of diseases like anthrax and smallpox has become a top priority. Using information from the CDC, IDPH and the Journal of the American Medical Association, Parker published a special issue of Advocate's physician newsletter devoted to bioterrorism. The newsletter is published electronically on Advocate's intranet and is mailed in hard-copy.

Cascading e-mails

Parker also uses Advocate's clinical information system to reach physicians, inserting headlines into the lab-results reporting tool to announce Webcasts on biological threats, weapons, diagnosis and treatment. Cascading e-mails from the chief medical officer also play a role. "We're using multiple channels," says Parker.

Leslee Stein-Spencer, IDPH's chief of emergency medical services, echoes that training, education and preparedness are the most important steps a health-care organization should take to address bioterrorism. In the last two years the agency has run 1,500 people—doctors, nurses and emergency medical technicians—through a four-hour program on recognizing and treating the effects of weapons of mass destruction. The course also trains people on how to access state resources designed to help local communities. Participants are introduced to the state's continually updated medical plan, which includes data such as the availability of hospital beds, blood units and negative-pressure beds.

"When September 11 came we implemented the plan and within two-and-a-half hours knew what resources we had. It really did work. We critiqued it

Dark Winter continued

6. Federal and state priorities may be unclear, differ or conflict; authorities may be uncertain, and constitutional issues may arise.

- In Dark Winter, tensions rapidly developed between state and federal authorities in multiple contexts.
- State leaders wanted control of decisions regarding imposition of disease-containment measures—mandatory versus voluntary isolation and vaccination; closure of state borders to all traffic and transportation; when or if to close airports. Federal officials argued that such issues were best decided on a national basis to ensure consistency and to give the president maximum control of military and public safety assets.
- Leaders in states most affected by smallpox wanted immediate access to smallpox vaccine for all citizens of their states, but the federal government had to balance these requests against military and other national priorities.
- State leaders were opposed to federalizing the National Guard on which they were relying to support logistical and public supply needs. A number of federal leaders argued that the National Guard should be federalized.

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Dark Winter continued

7. The individual actions of U.S. citizens will be critical in ending the spread of contagious disease—leaders must gain the trust and sustained cooperation of the American people.

- Dark Winter participants worried that it would not be possible to forcibly impose vaccination or travel restrictions on large groups of the population without their general cooperation.
- To gain that cooperation, the president and other leaders in the Dark Winter exercise recognized the importance of persuading their constituents that there was fairness in the distribution of vaccine and other scarce resources, that the disease containment measures were for the general good of society, that all possible measure were being taken to prevent the further spread of the disease, and that the government remained firmly in control despite the expanding epidemic.

and will in-service everyone on improvements at the end of November,” Stein-Spencer says. Her department gets the word out via mailed invitations to every hospital CEO in the state requesting the attendance of the medical director and nurse manager of the emergency department and the hospital administrator—at a minimum.

IDPH also mandates that every hospital have a system-wide crisis policy that includes a mechanism for recognizing clusters of patients arriving with “same/like” symptoms. Ambulances must report such clusters too, in addition to identifying hospitals signaling “bypass”—directing ambulances elsewhere due to overloading.

The best defense

IDPH is developing a smallpox plan that includes vaccination components. But Stein-Spencer acknowledges that once a disease like smallpox spreads and escalates among the population, the chances of any plan containing it are slim so that quarantine measures may have to be implemented. “The best defense is early recognition, vaccination and, if necessary, quarantine as there is no treatment for smallpox other than hydration and prevention of secondary infection,” she says, adding that a vaccine for smallpox won’t be ready for another year.

IDPH’s communication with providers includes broadcast-faxes to every ER in the state backed up with telephone calls to alert administrators that their ER has an important fax. “You have to make sure the right people are getting the right information,” says Stein-Spencer, adding that local health departments and providers are integral to IDPH planning and that they participate in it through the multidisciplinary task force that meets quarterly. Besides local hospitals and health departments, the task force includes fire departments, the FBI, the state attorney general’s office, local and state police and Red Cross.

Jim Bentley, Washington, D.C.-based senior VP at the American Hospital Association, says hospitals have always had disaster plans in place, but September 11 redefined the meaning of disaster.

Hospitals have already begun the process of assessing and upgrading their disaster plans and have the experience, teamwork and dedication needed to deal with any incidents that come their way, he says. To assist them, the AHA has developed a readiness assessment and a series of advisories. “We’ve made recommendations including increased coordination with police, fire and other local emergency organizations, expanded training of staff in chemical/biological response and review of drug sources and inventory levels of other supplies to ensure adequate amounts are on hand.

Best assessment

“AHA recently shared our best assessment of the resources and materials hospitals will need to be ready to respond to a mass-casualty event with our members, Congress and the media,” says Bentley. The following key areas must be addressed to increase hospital readiness:

1. medical and pharmaceutical supplies;

2. communication and notification;
 3. surveillance and detection;
 4. personal protection;
 5. hospital facilities;
 6. dedicated decontamination facilities;
-
7. training and drills; and
 8. mental health resources.

“Our resource estimates are based on a scenario of 1,000 casualties (inpatient and outpatient) seeking care at a metropolitan hospital and 200 for a rural hospital. These are intense demands that a hospital might have to sustain on its own for up to two days before federal help arrived,” he says. [The full document is available at www.aha.org in the “Disaster Readiness” section.]

“In any disaster situation, hospitals will work hand-in-hand with public health departments, police, fire and others of the emergency response network. If hospitals or our partners lack resources, then it could potentially hinder the ability to meet our communities’ needs in a disaster,” says Bentley.

Conclusion

It’s clear that there needs to be a new standard of disaster readiness, which will include increased coordination. It’s also clear that this will require a commitment of new resources by the federal government and others.

“Several lawmakers are considering legislation and AHA has shared our assessment with them. We think it’s important for lawmakers to get a candid assessment of the healthcare field’s needs. This important work is not going to be done tomorrow. Ultimately, Congress will review the needs and ultimately take some action to help the nation prepare. At this point, AHA estimates it will take billions—not millions—to meet the new level of readiness,” says Bentley.

Ward Kever, an Information Edge editorial advisor, suggests short-term solutions include: 1) immunization of healthcare workers, 2) CEU credits for nurses and doctors for diagnosing specific diseases, 3) dusting off and updating the existing disaster plans for such things as explosions, 4) creating new plans for the slower, more insidious events such as small pox, 5) setting up a national supply of shots and protective clothing (to share the costs) that could then be routed to a community where the events occur, 6) identifying, within a community, the organization with responsibility coordinating this type of disaster.

Longer term, we could: 1) work with the federal and state governments to undertake specific initiatives, 2) rebuild surge capacity with alternative back-up sites, 3) rebuild public health, 4) lobby for local, rather than national support funding.





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