3 Public Health Preparedness

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Terrorism poses a set of unique problems in the civilian sector, problems we have not faced before. But these problems also offer a number of opportunities. I see both the problems and the opportunities in my role as director of the new Office of Public Health Preparedness in the U.S. Department of Health and Human Services. This office did not even exist six months ago. Yet we are charged with addressing some of the most critical challenges we have ever faced as a nation. Perhaps the most serious problem we must confront is the threat of biological weapons. In 1993, now Secretary of State Colin Powell said, "Of all the weapons of mass destruction, it's the biological weapons that worry me the most." As recently as March 28, 2002, U.S. Department of Defense Secretary Donald Rumsfeld said, "Terrorists and terrorist organizations want to acquire weapons of mass destruction, but I am primarily concerned about them getting and using biological weapons." In post-September 11 America, when we have already seen an outbreak of anthrax in our mail, these words carry even more weight.

We have long lived with the threat of nuclear war. But nuclear weapons are more difficult to handle, manage, transport, and detonate than are chemical or biological weapons. The latter offer new opportunities to terrorist groups and smaller nations. These weapons can be made in relatively small places, with dual-use equipment, and at a relatively low cost. And they have a variety of delivery mechanisms. Despite knowing this, we have done very little about dealing

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with the threat of biological weapons until less than a year ago. We need to understand why we have not acted, because this delay has set in place our research agenda.

This chapter describes some previous incidents that have heightened our awareness, discusses the steps we are taking and where we are right now, and gives a brief overview of the problems ahead, particularly in the research area.

Previous Incidents and Response

We were not all that concerned about terrorism until 1995. During that year, three events happened that put the threat of biological and chemical weapons into sharp focus. The first was Aum Shinrikyo's attack in the Tokyo subway with sarin gas. In March, members of this group carried six packages onto the subway and then pierced them with umbrella tips. This released the deadly sarin gas, killing 12 and injuring 5,000. It was later discovered that they had tried on eight different occasions to aerosolize anthrax throughout Tokyo.

The second event was the defection of two of Saddam Hussein's sons-in-law in August. They brought with them chilling information about Iraq's advances in developing weapons of mass destruction. We found out that the sophistication and extent of the weapons in Iraq were far greater than we had thought, even though we had considerable intelligence in the area. We had to wonder what else was going on in the world, particularly in places where we had virtually no intelligence. We became concerned that there might be much more going on out there than we had imagined.

The third event actually happened in 1992, the information provided was not widely circulated until 1995. In December 1992, Ken Alibek defected from the Soviet Union. He was the number two man in their bioweapons program. He brought with him a fantastic tale of an enterprise then involving as many as 60,000 people in more than 50 different laboratories, dealing explicitly with biological weapons. This enterprise was equivalent to, and maybe slightly larger than, their nuclear enterprise. This information was regarded as being so outlandish that Abilek was kept under deep cover for quite a while. The information did not begin to be widely known until 1995,

when a Presidential directive to all departments mandated them to prepare to deal with terrorism.

In 1996, the Nunn-Lugar-Domenici Domestic Preparedness Initiative was proposed. It began a program that developed metropolitan medical strike teams, as they were called, in 120 cities in the United States. Police, fire, and emergency management personnel were trained, primarily through a program largely run by the Department of Defense.

During the course of this training, the term "chembio" arose because it was thought that if we have trained the first responders to deal with a chemical incident, they will also be able to deal with a biological incident. This idea has been surprisingly widely held throughout Congress and in the executive branch for quite a while, and it still revives regularly. In a chemical event or an explosive event, police, fire, and emergency rescue people are indeed needed to stabilize, evacuate, and decontaminate the area. But a biologic event is most likely going to be a silent, odorless, tasteless, undetectable release of an aerosol over an area. No one will know that anything has happened. Only after a couple of days to a couple of weeks do cases begin to show up in emergency rooms. The police, fire, and emergency rescue people are totally irrelevant to this problem. We would need trained medical personnel to counter a bioterrorism event through detection, patient treatment and perhaps isolation and the distribution of drugs or vaccines.

Are we addressing this need? In 1998, I spoke at a national conference on urban bioterrorism. There were probably 500 people in the audience. I asked if there were any physicians. Not one hand went up. Likewise, there was no one from public health, no one from a hospital, no one who had ever dealt with an epidemic. Attendees were police, fire, and emergency medical people, arms control people, physicists, mathematicians, and computer specialists. There was no one who had a clue as to what we were talking about when we discussed the use of biological weapons and the aftermath. It was not until 1999, that the budget for the Department of Health and Human Services, which has dealt with epidemics, was increased from $2 million to a $343 million. This increase allowed at least a beginning to do something to address this problem.

Historically, in the schools of medicine and public health, doing anything with biological or chemical weapons was virtually a taboo. When I was the dean at Johns Hopkins University for 14 years, we regularly turned down non-classified contracts from Aberdeen Proving Grounds that addressed physiologic behavior of various chemical agents related to nerve toxins. Indeed, anyone who had attended classified conferences was generally regarded with suspicion. It was a carryover, in part, from the Vietnam era. But there was also a feeling that those engaged in the healing arts should not have anything to do with chemical or biological weapons. This was not true in all universities, but it certainly was true in a lot.

Because of these attitudes, our research base is now very limited. We have identified many organisms of concern, but have very few people working on them. In fact, during an outbreak of plague in Surat, India, we hoped we would be able to contribute diagnostic capability. But so I was told, only one person (who was about to retire) was working in the United States on the laboratory diagnosis of plague.

Steps We Are Now Taking

We are in the early stages of thinking about what it is that we might do with regard to bioterrorism. We are oriented toward taking immediate steps to harden the civilian setting.

Our academic and research base is very small, indeed. This has to change. The Centers for Disease Control and Prevention identified six diseases to go on the Group A list. These are the diseases on which we want to focus to see what we can do in an immediate sense to cope with an attack. We are not concerned with a list of 30 or 50 diseases. We are concerned with a comparatively short list of diseases that would be catastrophic and potentially destabilizing. They are smallpox, anthrax, plague, tularemia, botulinum toxin, and the group of diseases that manifest themselves as hemorrhagic fevers. Of these, smallpox and anthrax are the most important.

How do we expect these to be released? We considered all of the possible mechanisms and identified the aerosol spread as the one we are most concerned about. Contaminating food or water is possible but unlikely to result in a potentially destabilizing epidemic of a

highly virulent disease. In spite of this, protecting water reservoirs seems to attract much attention from mayors and governors around the country. They are proposing a $4-billion program to protect our water reservoirs, when such contamination presents a minimal to negligible risk.

We see little prospect of interdicting those who might carry bioterrorism weapons. They can move them, in very small quantities, across borders, with little difficulty.

Detection at the time of release had seemed to be a very attractive idea. Many companies have produced detection devices. None look promising as candidates for widespread use. A significant problem is the occurrences of false positive reactions. Even one such alarm in a large building in the course of a year could result in serious problems

We identified training of medical and public health personnel as a key need. We must depend on physicians, primarily those working in emergency rooms, to report cases they have never seen before and for which they do not have training. We are looking at a fairly simple set of measures. We need to detect the organism or the fact that the organism has been released. So we need to detect possible cases very early. This is where we begin. These physicians would then call on public health people to say they have got a problem that needs to be defined. But this must take place in a public health infrastructure, which is virtually nonexistent in many, many municipalities, and very weak at the state level. To investigate, we need laboratories to identify what the organisms are. But these organisms are not usually looked at by laboratories, so we began with virtually no capability to diagnose.

Another problem we identified is where to house a surge of patients. At the present time hospitals are running very near to capacity. They are financially strapped and short of personnel. Many of the hospitals in major metropolitan health settings could not accommodate a sudden surge of 50 acutely ill new patients.

There is no question that we are facing many problems here. What are we doing about them? On January 10, 2002, a budget for the Department of Health and Human Services was signed by the President that was directed toward public health preparedness. Initially, the problem, as we see it, is to try to do what we can as quickly as we can to counter an outbreak should it occur. The budget this year is

for $3 billion, which is six times what the Department received last year ($500 million). And the President is asking for $4.5 billion for next year. The Office of Public Health Preparedness has the responsibility to set the agenda. It is a formidable task. As one staff member said, we have tried to get attention from the public, Congress, and our colleagues for the last three years. We have been in the desert, praying for a little rain, and suddenly we are hit with a typhoon. It is indeed overwhelming.

We have determined our first steps. We must strengthen our public health infrastructure and we must build our communications network so we have communication between public health, emergency rooms, and infectious disease specialists so that cases can be quickly diagnoses and appropriate measures taken to control the outbreak.

We now have a network of 81 laboratories capable of diagnosing a number of these agents and regularly testing to maintain their proficiency. Smallpox is a priority. Although smallpox has a minimal likelihood of release, the catastrophe that could occur were it to be released worries us greatly. We contracted for over 200 million doses of vaccine, with the desire to have it by December 2002. We are a little ahead of schedule at the moment. We should have plenty of vaccine by autumn of this year.

Until now, the anthrax vaccine had been produced by a method perfected in the 1950s. It is now produced in a fully certified laboratory. We see the possibility of a recombinant anthrax vaccine being available and we have put that vaccine on an 18-month delivery schedule. Such a vaccine should produce adequate protection with not more than two doses.

We are also working with the states. Since January 2002, a billion dollars have been distributed to the states, with a provision that they can spend 20 percent of this and then come back with plans and timelines to get more. Those plans are coming in to us at the present time. We also have a tremendous amount of regional planning going on to accommodate at least 500 new acute patients in hospitals in each municipal area.

More laboratories are being built so we will have more competency. Communications networks are being developed to connect the public health system to hospitals and laboratories and to police and emer-

gency medical services. We are moving ahead at a considerable pace, but there is much to be done.

Problems Ahead

Bioterrorism is not going to go away. We have already had a release of anthrax of very high quality. That material was not produced by somebody who picked up a little something in his kitchen and produced weapons-grade anthrax. This effort required many chemical reactions and a lot of experimentation. It is safe to assume that whoever produced this anthrax can produce more. We do not know the source of production or whether it was foreign or domestic. The most important question is when the next release will occur, and that worries us very greatly.

We have got to be better prepared at domestic, civilian levels than we are right now. But that is not the only problem we are facing. We are also facing a new era in biology. The biology of the 21st century is going to be very different. We have many people now with capabilities in microbiology who can do all sorts of things in recombinant work. We have already seen some fascinating work, such as taking a gene from the Ebola virus and putting it in HIV. Many new combinations are being made with various organisms, and I think with all good intentions. But is it possible that one of these can escape from a laboratory? If so, what kind of controls should we have? And if you do put controls on, how much do we inhibit legitimate science? We are just beginning to discuss these issues. At this time, we do not have many good ideas as to how we are going to balance the needs of security with the needs of research.

We are also facing many new and emergent infections. We were startled when HIV appeared and now we have an epidemic. Will we have more epidemics? Yes, of course. But, now, populations are greater, and many people live close together in huge urban environments. In tropical areas, many people live in close quarters with virtually no sanitation. The potential for organisms to continually mutate and become established and then spread is certainly there, better than ever before in history. We will see more of these epidemics.

So we are facing not only the biological weapons, but also new and emerging infections, the potential for recombinants, and various new organisms being created. All of these issues must be on our agenda.

Conclusion

The President has asked for much more money for the research budget of the National Institutes of Health next year, some $1.5 billion in all. This money would give us the potential to do a great deal more than we have done. How we are going to determine what is needed in a practical sense and match that with the basic research agenda, looking ahead 10 years, is not very clear. We have a monumental task ahead.