

TESTIMONY

UNITED STATES SENATE
Committee on Governmental Affairs

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April 18, 2002

Mr. Chairman and distinguished members of the Committee, thank you for the opportunity to testify on the subject of Public Health Preparedness for Bioterrorism. I am the Deputy Director of the Johns Hopkins Center for Civilian Biodefense Strategies. The mission of our center is to influence policies and practice in ways that lower the likelihood of mass casualty bioterrorist attacks on civilians, and in ways that would diminish the dire consequences of such attacks should prevention strategies fail. I am also a physician with a specialty in infectious diseases on the faculty of Johns Hopkins Hospital where I have worked for the past 10 years. This Committee has asked me address issues of coordination and communication among federal, state and local public health agencies and to offer comments on overall bioterrorism preparedness.

Communication and Coordination during the Anthrax attacks

The anthrax attacks of 2001 produced an extremely complicated set of management problems for public health agencies, with communication and coordination being particularly difficult. CDC had never before responded to a bioterrorist attack, let alone attacks in multiple states. The attacks necessitated rapid interactions between local, state and federal public health agencies on technical issues that evolved quickly. Pre-existing scientific knowledge was limited regarding a number of the complex issues (such as how best to prevent anthrax infection after exposure to the spores or how to assess the risk of an environment contaminated with anthrax spores), also seriously slowing down communication. The attacks required federal, state and local public health agencies to communicate fast changing information and guidelines to doctors, nurses and hospitals – something without precedent on this scale. No one had anticipated such a widespread need for rapid communication amongst public health agencies or between public health agencies and the medical care delivery system. This was a dynamic and changing context; the events changed as the anthrax cases and information unfolded, and public health agencies had to work very hard to keep up with changing conditions. At times, the need to change public health recommendations multiple times in a single day was unavoidable. There were dedicated public health professionals at the federal, state and local level who were working day and night to make the best interventions. This all being said, it is important to try to understand clearly where communication did not work well and why. There are a number of examples from the anthrax attacks that are useful. I would group communication difficulties of public health agencies during the crisis into three main categories: problems of incoming communication, problems of scientific analysis and decision-making, and problems with outgoing communication.

There were a number of problems with communication of incoming information. There were few efficient mechanisms to get information from where anthrax illnesses were occurring (e.g., the Capitol, Brentwood, NYC media organizations, NJ postal offices, hospitals, etc) to those at CDC, state or local health departments who needed to make real-time decisions and recommendations. In most places, doctors do not often seek guidance from local or state public health agencies, and therefore are not accustomed to sharing or reporting information to public health agencies. They are quite distinct professional communities that have far less routine interaction than is imagined. As a separate issue, tracking and managing the sheer volume of patient laboratory data, environmental testing data of various types and quality was an extremely difficult task for public health agencies. There were scores of environmental tests performed on buildings

suspected of being contaminated with anthrax spores. Simply getting the tests performed, processed and the test results forwarded to persons with decision-making responsibility in public health agencies was difficult. The anthrax attacks revealed how challenging it is for public health agencies to acquire and manage the type of incoming health and environmental data needed to make decisions and recommendations in a real-time crisis.

The second set of communication problems were related to the many complicated scientific problems that required new collaborations of experts to address. Most health care professionals, state and local public health agencies and the general public looked to CDC for the answers to technical scientific questions during the crisis. One key example of such a technical question was the role of the anthrax vaccine following the attacks. A recommendation regarding who should receive the anthrax vaccine was necessarily dependent on the answer to many scientific questions, including: how likely is it that anthrax spores could cause disease after being dormant in a body for weeks; would it be a safe alternative approach to wait for signs of anthrax infection and then begin immediate medical treatment; how much anthrax vaccine was actually available and how quickly would new vaccine be produced; and, how quickly would the anthrax vaccine produce immunity; how safe were existing vaccine stocks; and more. For CDC to answer these questions, or even to know what the range of questions should be, required input from experts from a variety of scientific backgrounds: experts in experimental biology, epidemiology, infectious disease medicine, anthrax vaccine science, and immunology. There were many other similarly complicated scientific questions (eg, what is the most effective antibiotic treatment regimen for anthrax; what risks should begin antibiotic prophylactic treatment to prevent disease; who should get the anthrax vaccine; what should be done about contaminated buildings; how likely is it that anthrax spores will leak out of envelopes, etc). For much of the crisis, there were not efficient processes for bringing together these disparate scientific communities to help provide information to CDC or for decision-makers, though processes for doing this did evolve as the crisis progressed. When answers to scientific problems could not be resolved with speed and authority, decisions could not be made, and necessary technical information or recommendations could not be communicated.

A third set of communication challenges were related to problems of outgoing information. Again, it is important to understand that these are complex, systems problems that will take strategy and resources to fix, but it is critical to know what did not go well in order to improve. First, there were not rapid or reliable ways for public health agencies to communicate to doctors and nurses what was happening or what public health was recommending. Doctors and nurses looked to public health agencies for recommendations on who to treat, vaccinate, and test. Doctors and nurses have told us that the during the crisis the information forthcoming from public health agencies was often too slow for what they needed; in other cases, public health agencies were making treatment recommendations quickly, but there were no easy mechanisms for delivering the information to their intended clinical audience. The chief of infectious diseases at one of America's best hospitals said in the midst of the crisis that he was getting had to get his medical information from CNN.

What is happening now to address these problems

Guidance and Grants for Public Health Agencies

The Appropriations Bill of 2002 appropriated DHHS 10 times the pre-existing funding for bioterrorism preparedness programs, with much of that going to state public health agencies. These grants are being distributed rapidly by DHHS, with benchmarks set that are coherent and comprehensive. Some of those benchmarks are wisely aimed at improving communication capacity. The Office of Public Health Preparedness in HHS is moving with speed and efficiency to get this grant money to public health agencies. The focus on state and local public health agencies is on target; state and local health systems will bear much of the burden for preparing and responding to bioterrorist attacks.

But our expectations for the short term must be realistic. At baseline, public health agencies around the US have a limited capacity to drop everything and immediately

begin an outbreak investigation; many cannot even find the human resources to answer an emergency hotline 24 hrs day. We hear that state public health agencies have had literally to put their other work on hold just to respond to the new HHS grants. This looks like a great deal of money to be spending on public health, but in terms of true preparedness for bioterrorism, we need to understand that we are asking public health agencies to now provide a serious component of our national security. And with respect to bioterrorism, we are essentially beginning from a standing start. For years, public health has often been among the first things cut in state budgets. In many locations, it has a broad mission without clear edges, diluting its power and capacity. In the end, this funding is only a down payment on the ultimate cost of the public health system needed to confront the bioweapons threats of the future.

Changes at CDC

CDC is and should remain the federal agency with responsibility for providing technical expertise and resources to state and local public health agencies for biopreparedness. It should be supported in this effort. It is an organization with many dedicated professionals and a home to many great scientists. But we must acknowledge that bioterrorism response is different in key ways from other CDC missions. And it is a tremendous new responsibility. In order for CDC to bring the nation substantial and sustained improvements in bioterrorism preparedness, CDC will require the development of new systems and strategies, and it will need resources commensurate with this responsibility.

Path forward on improving communication and bioterrorism preparedness

At the most fundamental level, countering the complex threat of bioterrorism will require strategic planning, funding, human capital and time. Without these, our best intentions will not make us more secure. There are also a number of additional specific initiatives that in my judgment would improve communication among federal, state and local public health agencies prior to and during a bioterrorist attack:

- 1) Connections between public health agencies and medicine need to be greatly strengthened – an issue that can also be called *improved connectivity*. Doctors and nurses need more efficient ways to communicate information to public health officials and vice versa. I think this is more important than sophisticated electronic surveillance systems. It will take will, people and time, because in most places these are very distinct communities. But I cannot conceive of an electronic surveillance system that would have detected the anthrax case in Florida faster than Dr. Larry Bush recognizing a case of anthrax and quickly relaying his concern by phone to Dr. Malecki of his local health dept. Unfortunately, the ability for medicine and public health to connect in that Florida county is the exception not the rule. But we need to work to change that.
- 2) The clinical medical care community should develop systems to more quickly communicate key information within its own organizations and professional societies. Other than television or radio broadcast, no existing information systems that I am aware of could immediately reach a majority of physicians or nurses practicing in a city or state, though some localities are further ahead on this issue than others. An example of a system that developed in response to this type of information need is the daily conference call started by physicians in the DC area to share information on the evolving anthrax crisis. This proved to be extremely valuable to them and eventually was a conduit to send information from their community to public health agencies and vice versa.
- 3) CDC and other public health agencies should design more robust processes for incorporating the various needed scientific competences into decision-making during a crisis. There is no easy fix for this – a new bioweapons attack with different pathogen or via different dissemination technology would require a new combination of competencies at the table. But we think it is important to assume broad outside scientific collaboration will be needed and to plan for it.
- 4) A priority should be placed on improving strategies for communicating with the American public. The importance of communicating comprehensive, current

information to the public in the aftermath of such an attack cannot be overemphasized, even if it is disturbing information. It is important to have our medical and scientific leaders who will lead such efforts be exceptionally trained in the difficult skill of media communication. The potential for positive or negative impact is so great that this must be a priority.

5) I have been greatly impressed by the value of drills and exercises in preparing for the anthrax attacks. Individuals or organizations that had begun to do bioterrorism preparedness training or exercises prior to the attacks of 2001 consistently reported how useful they have been. New relationships and lines of communication were developed. There was a new understanding of the roles other groups in a bioterrorism response effort would play. While there are certainly examples of poorly designed or inefficient exercises, many more exercises have been of clear value. Exercises should continue to be an important component of bioterrorism preparedness efforts at all levels of public health.

6) Moving beyond communication issues, there are an array of other strategic initiatives that will be needed to counter the bioweapons threat. The nation needs regional health care plans designed to cope with mass casualty attacks. The nation needs a sustained biomedical research and development program aimed at preventing, diagnosing and treating the range of infectious diseases that exist now and those that will be engineered in the future. The nation needs the deep engagement of its biological scientists in and out of government to seek new ways to manage the growing power of this science. And each of these complex and long-term pursuits will require more talent and human resources in government. We cannot accomplish all we need without more human capital.

The bioweapons threat ahead

It is essential to analyze what happened in the fall, what went well and what did not, because the threat of bioweapons will only grow with time. Senators Hart and Rudman and the Commission on National Security in the 21st Century, in their prescient report on national security, singled out bioweapons as one of the most serious threats to US national survival. Admiral Stansfield Turner has said that bioweapons are one of the only two categories of weapons that have the theoretical capacity to “push the nation to the point of non-recovery.” Bioweapons ultimately represent a survival threat to the nation. The anthrax attacks of the fall were just the prologue to the bigger story of bioweapons. In the years ahead, the biotechnology used to create bioweapons will become far more powerful, more available and less expensive. Engineering, computing, and the capital markets will push biology forward on a rapid trajectory. What used to take a highly skilled team of scientists to accomplish can now be done in rapid fashion with automated kits in an afternoon. Industrial techniques allow the cheap manufacture of pathogens or toxins to tonnage quantities in places around the world.

Already present on the planet are examples of biological knowledge that are disturbing: the methods for making new influenza strains never before seen on earth; the directions for making Ebola virus from non-living fragments of genetic material; the techniques to make anthrax or plague resistant to many or even all available antibiotics; attempts to combine a set of genes from viruses that cannot spread to viruses that can; biological aerosols that might once have harmlessly floated away can be stabilized in the environment and altered to become more easily inhaled. The long-term threat is certainly grave. It is therefore critical to take a dispassionate look at how we have prepared for bioterrorism and what now should be done. In the end, the measure of success is whether our public health and other key government institutions are preparing to address not only more anthrax attacks, but the future of bioweapons as well.

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