

**Statement of Alan P. Zelicoff
Senior Scientist
Sandia National Laboratories**

**United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Oversight and Investigations**

November 1, 2001

**Statement of Alan P. Zelicoff, Senior Scientist
Sandia National Laboratories**

**United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Oversight and Investigations
November 1, 2001**

Mr. Chairman and distinguished members of the Committee, thank you for the opportunity to testify today. My name is Alan Zelicoff, and I am a senior scientist at Sandia National Laboratories in Albuquerque, New Mexico. Sandia is a multiprogram laboratory of the National Nuclear Security Administration (NNSA) of the United States Department of Energy.

I am a physician and physicist at Sandia's Center for National Security and Arms Control. Our center develops technologies for counter-proliferation of weapons of mass destruction, and for verification of the entire spectrum of arms control treaties to which the United States is a party. I practiced internal medicine for about a decade. My area of interest since joining Sandia twelve years ago has been in biological weapons non-proliferation. I have pursued technical work in the laboratory, as well as in my capacity as an Advisor for nine years on the U.S. Delegation to the Biological Weapons Convention.

These activities have repeatedly demonstrated to me that we, as a country, have not taken the biological weapons proliferation problem seriously, and we have squandered important opportunities in the international arena to strengthen norms against the acquisition and use of biological materials as weapons. But more important, Mr. Chairman, is that our public health systems and traditional medical care delivery systems are minimally prepared to detect the early manifestations of disease that is intentionally introduced into a community.

In any biological weapons attack, large or small, hours matter. I hope to make this particularly important point vivid for the Committee, and to make a suggestion for a simple measure that we can implement immediately, not merely to plug the obvious gaps, but as a step toward a systematic solution that will be of day-to-day benefit in the diagnosis and treatment of all infectious diseases of public health importance.

There are many dirty little secrets in medicine. One of them is this: Practicing physicians don't report unusual diseases to local public health officials (including signs and symptoms that could be due to bioterrorism), and public health officials don't have the ability to provide timely disease information to physicians working in clinics and hospitals. In my ten years of medical practice, I never—not once—saw a physician or physician assistant pick up the phone to report a so-called “reportable” disease. Even in areas of the country where reporting of a small set of key infectious diseases is a legal requirement, physicians rarely comply. Why? The process is burdensome, inefficient, and most importantly, almost never gives anything back to the physician that is of relevance to the patient she is caring for.

The reporting network—and I use this term loosely—relies on physicians first to recognize that they are dealing with an unusual disease; second, to know the phone number of whom to call; third, to be willing to wait for a public health officer to be available; and fourth, to field follow-up phone calls and answer what seems to be a never ending stream of questions. The first three are unlikely to come to pass, and the fourth is a powerful disincentive against accomplishing the first three.

Busy doctors—and they are busier, though not necessarily more productive, than ever before—don't have time for this. Yet, they are desperately in need of information about even *common* diseases circulating in the community. As but one example, we know that 60 percent—yes, 60 percent—of antibiotics prescribed in the primary care setting are unnecessary or inappropriate. During flu season when *viruses* are causing disease, physicians routinely reach for the prescription pad and write orders for anti-*bacterial* antibiotics. Part of this is due to ignorance, and the other part is due to pressure from patients who are themselves ill informed about the diseases that are prevalent in their community. A system that provided physicians with this knowledge alone, and the means with which to show their patients what is going on in the disease mix at any given time would, in and of itself, greatly improve the quality of medical care in the United States and substantially reduce costs and the emergence of antibiotic resistance.

You may be surprised to learn that the repository of knowledge regarding infectious diseases resides not with the primary care physician but in local (and I emphasize *local*) public health officials. These highly trained specialists—physicians with specialties in disease outbreak investigation (epidemiologists), veterinarians, and nurses—know by dint of their long experience, the pattern diseases in their area—which viruses are normal, what microbes are unusual, what seasonal course diseases take, all of which

varies tremendously from place to place in the United States. Further, while public health officials rarely see patients in the clinical setting, they are well bearded in the truly novel diseases that primary care physicians and community veterinarians see once in a lifetime if at all: plague, anthrax, foot-and-mouth disease, and other potential bioterrorism related diseases. It is perhaps best to think of epidemiologists as disease hunters with the wits and senses of fine detectives, reinforced by strong backgrounds in medicine and statistics. They are much more than the usual doctor or veterinarian.

What is required immediately (actually, it has been required for a long time) is an inexpensive tool that will establish and maintain communication between overworked clinicians and out-of-reach public health officers. The tool must be easy and intuitive to use, ubiquitous, very fast, and sustainable on its own merits. It does little, if any, long-term good to assign CDC epidemiologists to a few hospitals in New York City only during a crisis, when we all know that the costs involved are prohibitive and that there are far too few CDC personnel to be in even the fifty largest metropolitan areas, let alone everywhere.

But physicians and patients *are* everywhere; so are veterinarians and the animals they care for. The challenge I have faced in my work is figuring out a way to help these earliest-possible “sensors” of disease report accurately to public health officials and meet all of the demanding requirements I have just outlined. I think we have a solution. It is not a “complete” solution, but it is an essential part of a *systematic* solution. At Sandia, we have developed an Internet-based, secure, inexpensive, simple reporting system that we call the Rapid Syndrome Validation Project (RSVP). The Department of Energy’s Chemical and Biological Non-Proliferation Program—a small, forward-looking, and creative bunch of planners—has funded this work.

What they realized about two years ago is that good health surveillance (of animals and humans) is also good counter-terrorism against biological weapons. Automated sensors are still a little way off, and more to the point, will *never* be as ubiquitous as people. But with some straightforward modeling, we at Sandia were able to show that if public health authorities can be apprised of the earliest cluster of illness that occurs a few days after a large scale bioterror attack (rather than at the time of first death or even the time of first positive laboratory test result), the vast majority of people exposed—even to anthrax and smallpox—can be saved. This is because, by definition, there will always be a few percent of the exposed population who will show symptoms first. This will occur because some people receive a larger dose of the biological agent, or because some people are more susceptible to disease, biological variability being what it is.

Equally important—and I can not emphasize this enough in light of our recent experience in Florida and in the Washington area—is that the system can show whether there is *widespread* exposure, or instead, that it is likely to have been more localized. This is critical information for decision makers. It goes directly to the question of how many people need to be tested, how many people need prophylaxis, and how many people should be followed-up. Mark Twain had it about right when he said, “It ain’t so much knowing about that what is, but not knowing about that what ain’t.” Reassuring the public with substantive knowledge of the limits of exposure will make all the difference in the use of resources should there be a large scale dissemination, and all the difference in degree of disruption of our lives should the use of decidedly low-tech but nonetheless terror-inducing dissemination of anthrax by mail be repeated in other cities.

Let me show you briefly, how the system works.

[DEMO follows, if possible].

I don’t purport that syndrome-based surveillance is the complete answer to our bio-terrorism problem, nor that it is the salvation of the decaying public health infrastructure in the United States. What it *does* do, however, is provide an easy, inexpensive way to get the real experts (public health officials) the data they need to decide whether or not a disease outbreak investigation is warranted, at the earliest possible time, well before our laboratory-based surveillance system would alert them to serious disease in the community. It also gives back to physicians something useful in the bargain.

We need a decision at the highest levels to *begin* with a system like RSVP that is built with a view toward add-ons and augmentation for various potential users, from local authorities (such as public health officials and local governments) to national-level decision makers and those who allocate precious remedial resources (such as FEMA and the CDC).

One final thought: for the past nine years or so, the United States has participated in negotiations in Geneva to implement measures to strengthen compliance with the Biological Weapons Convention. As a participant in Geneva and in the interagency work in Washington, I believe that the current Administration was correct to reject the draft Protocol. As I have testified and written previously, the Protocol is not merely worthless; it is worse than worthless, as it would provide easy refuge for cheaters and place unacceptable burdens on U.S. industrial and military facilities. This is not merely an opinion. My conclusion is backed up by the only scientifically cogent, technically meaningful mock inspections conducted by any States Party to the Convention—done here in the United States and actively ignored by the low-level staffers who pretended

or presumed to direct the formation of our policy on the Protocol at the time. Let me be clear: The failure of the Protocol lies, in my view, at the feet of the previous Administration. The delegation and interagency working group suffered enormously from a near total lack of leadership and a complete absence of vision. Despite protestations to the contrary, there was no thoughtful senior level involvement in the U.S. negotiating strategy beyond a single tired phrase repeated yearly in the State of the Union address.

Because of the events of the last several weeks, I am sympathetic to the argument that for the short term, and at the moment, there is little time for policy makers to re-think our approach to future Protocol negotiations. But when the management of the current crisis no longer dominates all of the attention of decision makers, I would urge the United States government to appoint a seasoned negotiator with one key goal in mind: to establish an international system of disease monitoring that is electronically based and of value to clinicians and veterinarians and their patients.

Ladies and gentlemen of the Committee, we have dawdled far too long in addressing the collapse of the public health system. We have always had, and will continue to have, a mostly non-government, private health care system. Yet, the expertise for population health lies not in individual practitioners but with the oft-forgotten state and county public health epidemiologists who work with a dearth of data but a plethora of expectation. We can and must do better than this. A simple, Internet-based, *syndrome*-based reporting system is the key component of a renewed, effective surveillance network that will serve us during this critical hour, as well as *after* we have resolved this most acute crisis, as we surely will. The questions are: How many lives will be lost in the process, and how quickly can we restore a sense of confidence to the American people? With inexpensive, readily available tools, the medical and public health communities will be among your chief agents and allies in relieving uncertainty and restoring faith, which are so essential to getting people back to living their lives and fulfilling their hopes.

Thank you Mr. Chairman.