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STAMPING OUT ANTHRAX IN USPS FACILITIES: TECHNOLOGIES AND PROTOCOLS FOR BIOAGENT DETECTION

HEARING

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING THREATS AND INTERNATIONAL RELATIONS

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

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STAMPING OUT ANTHRAX IN USPS FACILITIES: TECHNOLOGIES AND PROTOCOLS FOR BIOAGENT DETECTION

MONDAY, MAY 19, 2003

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING THREATS AND INTERNATIONAL RELATIONS,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 1 p.m., in room 2247, Rayburn House Office Building, Hon. Christopher Shays (chairman of the subcommittee) presiding.

Present: Representatives Janklow, Kucinich, Linda Sanchez of California, Ruppersberger, and DeLauro.

Staff present: Lawrence Halloran, staff director and counsel; R. Nicholas Palarino, PhD, senior policy advisor; Kristine McElroy, professional staff member; Robert A. Briggs, clerk; Joseph McGowen, detailee; David Rapallo, minority counsel; Denise Wilson, minority professional staff member; and Jean Gosa, minority assistant clerk.

Mr. SHAYS. Good afternoon. A quorum being present the Subcommittee on National Security, Emerging Threats and International Relations hearing entitled, "Stamping Out Anthrax in Postal Facilities, the Technologies and Protocols for Bioagent Detection," is called to order.

Whether the mail-borne anthrax attacks of 2001 were of domestic or foreign origin remains a mystery. The investigation, to date, has not discovered who forever transformed once innocent letters and packages into ubiquitous vectors of disease. So the lessons learned from these tragic events remain our best defense against further attempts to contaminate the mail stream and other public spaces with deadly spores.

There was much to learn. Once it became clear the envelopes sent to Senators Leahy and Daschle had left a deadly trail of extraordinarily virulent statically volatile anthrax, established assumptions about the ancient pathogen had to be discarded. The accepted lethal dose of 8,000 to 10,000 air borne germs, derived mainly from animal data, had to be revised drastically downward. Perhaps to just a single spore. Sampling and testing protocols proved insensitive to finely engineered material easily reaerosolized.

It is those sampling and testing protocols we examine today. The search for anthrax at the Wallingford, CT, postal facility offers an instructive case study, a cautionary tale on the need to maintain

a more aggressive approach to novel health hazards in the workplace.

Last month the General Accounting Office released a report critical of Postal Service communications to employees during the anthrax crisis. Confusing communications stemmed, in part, from what has been generously characterized as an evolving system of environmental sampling. In truth, it only evolved from a complacent, almost symbolic program to disprove the presence of anthrax to an appropriately aggressive effort to find spores because Mrs. Ottili Lundgren died.

Obviously, several negative factors at Wallingford provided no reliable evidence the facility was free of potentially deadly anthrax. Jurisdictional jealousies, false economies and some scientific hubris artificially limited the quantity and quality of sampling and testing. Facing a wholly new situation, understandable errors were made, but too often, and for too long, those mistakes were not made on the side of excess caution but in the service of unwarranted conclusions about the safety of contaminated facilities.

When a finding of negative does not mean zero and just a few spores can be as deadly as a million, sampling must be widespread and aggressive. Testing must yield sufficiently detailed information to allow health officials and the public to make sound decisions about the prophylactic treatments and site decontamination.

Despite the hard-learned lessons of Brentwood, the Hart Building and Wallingford, standardized sampling and testing protocols are not yet complete. It seems likely a new anthrax outbreak by mail would trigger another confusing cascade of interagency committees and inconsistent testing regimens. Until uniform, scientifically validated protocols are in place, we all stand as sentinels like Ottili Lundgren, human detectors waiting for our immune systems to sound the alarm.

Our witnesses today will describe current anthrax sampling and laboratory testing technologies and efforts to apply those technologies more consistently and forcefully in the future. We appreciate their time and expertise and we look forward to their testimony.

[The prepared statement of Hon. Christopher Shays follows:]

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Statement of Rep. Christopher Shays
May 19, 2003

Whether the mail-borne anthrax attacks of 2001 were of domestic or foreign origin remains a mystery. The investigation to date has not discovered who forever transformed once-innocent letters and packages into ubiquitous vectors of disease. So the lessons learned from those tragic events remain our best defense against further attempts to contaminate the mail stream and other public spaces with deadly spores.

There was much to learn. Once it became clear the envelopes sent to Senators Leahy and Daschle had left a deadly trail of extraordinarily virulent, statically volatile anthrax, established assumptions about the ancient pathogen had to be discarded. The accepted lethal dose of eight to ten thousand airborne germs, derived mainly from animal data, had to be revised drastically downward – perhaps to just a single spore. Sampling and testing protocols proved insensitive to finely engineered material easily re-aerosolized.

It is those sampling and testing protocols we examine today. The search for anthrax at the Wallingford, Connecticut postal facility offers an instructive case study, a cautionary tale on the need to maintain a more aggressive approach to novel health hazards in the workplace.

Last month, the General Accounting Office released a report critical of Postal Service communications to employees during the anthrax crisis. Confusing communications stemmed, in part, from what has been generously characterized as an "evolving" system of environmental sampling. In truth, it only evolved from a complacent, almost symbolic program to disprove the presence of anthrax to an appropriately aggressive effort to find spores because Mrs. Ottilie Lundgren died.

Obviously, several "negative" findings at Wallingford provided no reliable evidence the facility was free of potentially deadly anthrax. Jurisdictional jealousies, false economies and some scientific hubris artificially limited the quantity and quality of sampling and testing. Facing a wholly new situation, understandable errors were made. But too often, and for too long, those mistakes were not made on the side of excess caution but in the service of unwarranted conclusions about the safety of a contaminated facility.

When a finding of "negative" does not mean zero, and a few spores can be as deadly as a million, sampling must be widespread and aggressive. Testing must yield sufficiently detailed information to allow health officials, and the public, to make sound decisions about prophylactic treatments and site decontamination.

Despite the hard-learned lessons of Brentwood, the Hart Building, and Wallingford, standardized sampling and testing protocols are not yet complete. It seems likely a new anthrax outbreak by mail would trigger another confusing cascade of inter-agency committees and inconsistent testing regimens. Until uniform, scientifically validated protocols are in place, we all stand as sentinels, like Ottilie Lundgren, human detectors waiting for our immune systems to sound the alarm.

Our witnesses today will describe current anthrax sampling and laboratory testing technologies, and efforts to apply those technologies more consistently and forcefully in the future. We appreciate their time and expertise, and we look forward to their testimony.

Mr. SHAYS. Governor do you have any statement you'd like to make.

Mr. JANKLOW. No, sir.

Mr. SHAYS. Now, to get to our panel we have Dr. Keith Rhodes, Chief Technologist, General Accounting Office, accompanied by Mr. Bernie Ungar and Dr. Jack Melling as well.

Second, testimony from Dr. Robert G. Hamilton, Director, John Hopkins, and we have accompanying him Mr. Barry Skolnick.

Third, testimony from Colonel Erik A. Henchal, Commander, U.S. Army Medical Research Institute of Infectious Diseases, accompanied by Dr. George Ludwig.

Gentlemen, if you would stand we'll swear you in. Anyone else who might be giving testimony, if you'd stand and raise your right hands please.

[Witnesses sworn.]

Mr. SHAYS. Note for the record that all the witnesses have responded in the affirmative.

I ask unanimous consent that all members of the subcommittee be permitted to place an opening statement in the record, and that the record remain open for 3 days for that purpose. Without objection, so ordered.

I ask unanimous consent that all witnesses be permitted to include their written statements, and without objection, so ordered.

I also, ask unanimous consent that my colleague from Connecticut, Rosa DeLauro, be allowed to participate as a member of the subcommittee. Without objection, so ordered.

Do you have a statement you'd like to make? If you do, you can.

Ms. DELAURO. If I can, I would thanks. Thank you very have much, Mr. Chairman. I appreciate your accommodation of my being here to listen to the testimony today.

As a fellow member of the Connecticut delegation, I know we share the same concerns with regard to safeguarding our Postal System so that the American people and our postal workers are never again really put at risk by biological attacks like the anthrax attacks that claimed the lives of five people, including Connecticut resident Ottili Lundgren.

Today's hearing is an important opportunity to learn what happened in the fall of 2001 during the anthrax attacks on our Postal System, and in particular at the Southern Connecticut Processing and Distribution System in Wallingford, CT, which is in my district, and which I have visited several times since the attacks.

Today, we will examine our response to that crisis. In particular, what went right, what went wrong, and what we can do better if there is ever a next time. In retrospect, I think we were very lucky that no Connecticut postal workers died during the attacks that contaminated mail that passed through the Wallingford facility because there were several communication breakdowns, and that concerns me greatly.

As others have noted, the Postal Service conducted two tests on the Wallingford facility following the tragic death of Ms. Lundgren to investigate whether that facility had any traces of anthrax. The results of those tests using dry and wet swabs and taken on November 11 and 21, 2001, respectively, were negative. Tests con-

ducted by the Centers for Disease Control on November 25 were also negative.

But as postal workers continued to work at the Wallingford facility, a more comprehensive test was conducted by the CDC 3 days after the initial CDC tests using wet wipes and the HEPA vacuums, and those tests came back positive. Further tests, taken by the CDC and the Postal Service, confirmed those positive results. Three million anthrax spores were found on mail sorting machines.

So my concern is why did it take so long to detect the contamination, and why was not more comprehensive testing done following Ms. Lundgren's death, especially given that postal workers continued to work at the facility. One would think that using all the resources available would be an urgent priority.

My other concern relates to the Postal Service's seeming reticence to make public those later test results that showed that its workers were, in fact, at risk. While I understand that the Postal Service said it was following its guidelines that said results must first be validated before being made public, why then did the service show no such reticence in releasing the negative, and as it turned out, false results of the earlier tests?

There's an inconsistency here that I find troubling when we are dealing with matters of public health, I think the public is better served when we err on the side of caution, when we are more, not less, forthcoming with releasing such information. We simply cannot afford to take chances with people's lives, particularly given the truly heroic efforts of those postal workers at Wallingford, who soldiered on in the face of an unseen and deadly threat. Eleven hundred employees at the Wallingford Postal Facility deserved to have a full understanding of the facts, so that they could make an informed decision before going to work every day.

I commend my colleague from Connecticut, Chairman Shays, for convening this hearing today. I hope that we can correct the problems that flowed or hindered our response and continue to foster those things that went right. All of us want the same thing for the American public to be safe and to be protected.

As a member of the Labor Health and Human Services Appropriations Subcommittee, which oversees funding for CDC, I'm also looking forward to hearing from the CDC and from Connecticut's Department of Public Health about how they worked together to stem this outbreak in Connecticut. Griffin Hospital, in nearby Derby, very quickly identified the case of anthrax and isolated the outbreak. Again, we are fortunate that we had only one death.

With that, I thank the chairman and the committee for allowing me to participate today and hope that we can make a real difference in the fight against biological terrorist attacks. Thank you again Mr. Chairman.

Mr. SHAYS. I thank the gentlewoman. We're grateful to have you.

[The prepared statement of Hon. Rosa DeLauro follows:]

STATEMENT OF THE HON. ROSA L. DELAURO
AS PREPARED FOR DELIVERY
FOR THE CONGRESSIONAL HEARING ON
"STAMPING OUT ANTRHAX IN USPS FACILITIES"
RAYBURN BUILDING, ROOM 2247
MONDAY, MAY 19, 2003

Thank you, Mr. Chairman, and thank you for inviting me to join you at this hearing today. As a fellow member of the Connecticut delegation, I know we share the same concerns with regard to safeguarding our postal system, so that the American people and our postal workers are never again put at risk by biological attacks like the anthrax attacks that claimed the lives of five people, including Connecticut resident, Ottilie Lundgren.

Today's hearing is an important opportunity learning from what happened in the fall of 2001 during the anthrax attacks on our postal system, in particular at the Southern Connecticut Processing and Distribution Center in Wallingford Connecticut, which is in my district and which I have visited several times since the attacks. Today we will examine our response to that crisis – in particular, what went right, what went wrong and what we can do better if

there ever is a "next time." In retrospect, I think we were very lucky that no Connecticut postal workers died during the attacks that contaminated mail that passed through the Wallingford facility, because there were several communications breakdowns that concern me greatly.

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by the CDC and the Postal Service confirmed those positive results. 3 million anthrax spores were found on mail sorting machines.

So my first concern is why did it take so long to detect the contamination and why wasn't more comprehensive testing done following Mrs. Lundgren's death? Especially given that postal workers continued to work at the facility, one would think that using all the resources available would be an urgent priority.

And my other concern relates to the Postal Service's seeming reticence to make public those later test results that showed its workers were at risk. While I understand that the Postal Service has said that it was following its guidelines which say the results must first be validated before being made public, why then did the Service show no such reticence in releasing the negative—and, as it turned out, false—results of the earlier tests?

There is an inconsistency here that I find deeply troubling. When we are dealing with matters of public health, I think the public is better served when we err on the side of caution – when we are *more*, not less forthcoming and straightforward with releasing such information. We simply cannot afford to take chances with people's lives – particularly given the truly heroic efforts of those postal workers at Wallingford, who soldiered on in the face of an unseen and deadly threat. 1,100 employees at the Wallingford postal facility deserved to have a full understanding of the facts so they could make an informed decision before going to work everyday.

So I commend my colleague from Connecticut, Chairman Shays, for convening this hearing today, and I hope we can correct the problems that slowed and hindered our response, and continue to foster those things that went right. All of us want the same thing: for the American public to be safe and protected.

As a member of Labor, Health and Human Services Appropriations Subcommittee which oversees funding the CDC, I am also looking forward to hearing from the CDC and from Connecticut's Department of Public Health about how they worked together to stem this outbreak in Connecticut. Griffin Hospital, in nearby Derby, very quickly identified the case of anthrax and isolated the outbreak. Again, we were very fortunate that we had only one death.

So with that, I thank the Chairman and the committee for allowing me to be here today, and hope we can make a real difference in the fight against biological terrorist attacks. Thank you again.

Mr. SHAYS. Mr. Ruppersberger, welcome.

Mr. RUPPERSBERGER. Thank you, Mr. Chairman. While the focus on today's hearing is on the Wallingford, CT incident and the June 2 rollout of detection test sites across the country, I have particular interest in this topic.

I represent the Baltimore area. The Baltimore Distribution Center has been the first and only pilot test site to date. Baltimore has been running the Bioagent Detection System [BDS], since June 2002. Using state-of-the-art technology, there have been no positives since the pilot program began and their success has allowed for the rollout to remain on schedule. My understanding of the issue goes beyond the Baltimore facility. The pilot system has been built by Northrup Grumman and Davis Industries, which are both in my district, and I have visited those manufacturing areas and been briefed on that, and they are building systems now for 14 test sites throughout the country.

The Aberdeen Proving Grounds, Army Engineers and John Hopkins have all played a vital role in this technology. We have learned so much in the last year and a half about bioterrorism and how to apply technological advances to a new line front defense workers like the Postal Service, and I look forward to the testimony today and learning more about where we need to go.

Thank you.

Mr. SHAYS. Thank you very much.

I'm just looking. We don't have enough chairs for folks. I'm interested in maybe having the second panelists, if you don't mind, use the first three chairs on either side, and that will free up some chairs. So if some of the second panelists could just sit up front here, we'd appreciate that. Thank you very much, and that frees up a few chairs if someone wants to grab them.

OK.

We're going to hear first from Dr. Rhodes and then Dr. Hamilton and then Colonel Henchal. The way we do it is, we do the 5-minute rule, and we rollover the clock. I assume you don't take the second full 5 minutes, if you could stop a minute or two into your second round, that would be helpful. So you might have to summarize, and obviously, so we are all set.

Dr. Rhodes.

STATEMENTS OF DR. KEITH RHODES, CHIEF TECHNOLOGIST, CENTER FOR TECHNOLOGY AND ENGINEERING, APPLIED RESEARCH AND METHODS, ACCOMPANIED BY BERNARD UNGAR, DIRECTOR PHYSICAL INFRASTRUCTURE ISSUES; DR. JACK MELLING, FORMER HEAD UK CENTER APPLIED MICROBIOLOGY AND RESEARCH; DR. ROBERT G. HAMILTON, DIRECTOR, JOHN HOPKINS, ACCOMPANIED BY BARRY SKOLNICK; AND COLONEL ERIK A. HENCHAL, COMMANDER, U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES, ACCOMPANIED BY DR. GEORGE LUDWIG

Dr. RHODES. Thank you. Mr. Chairman, members of the subcommittee, I'm Keith Rhodes, GAO Chief Technologist and the Director of the Center for Technology and Engineering——

Mr. SHAYS. I'm going to ask you to talk into the silver mic. See if we can hear you better.

Dr. RHODES. I'm Keith Rhodes, GAO, Chief Technologist and Director of GAO Center for Technology and Engineering. I'm accompanied by Bernie Ungar, Director for Postal Issues in the Physical Infrastructure Team and Dr. Jack Melling, former head of the UK Center for Applied Microbiology and Research.

We are pleased to be here today to present our findings on anthrax testing conducted by the Postal Service and the Centers for Disease Control and Prevention at the Southern Connecticut Processing and Distribution Center in Wallingford, CT.

As you know in September and October 2001, four letters containing bacillus anthracis spores were mailed to news media personnel and congressional officials. As a result, the letters contaminated numerous postal facilities and exposed several postal workers to anthrax. Some of the workers became sick, with two dying of inhalation anthrax. Three other people also died from inhalation anthrax, including an elderly woman in Connecticut, a postal customer. After contamination was found in the Wallingford facility, a union official raised concerns regarding how postal managers communicated test results to workers. We have issued a report in this regard, the recommendations of which are included in this testimony.

Even though our analysis of the Wallingford incident is only one part of the larger study we are doing for you, it gives unique insight into the lessons that need to be learned from the response of the Federal Government, State health departments and the Postal Service to the anthrax attacks.

The Wallingford facility was unique in that it did not directly handle the anthrax letters. Rather, it was cross-contaminated by them, with the largest number of spores being found in a sample collected from a single machine. There was, however, evidence that the spores had become air borne since small numbers of spores were found in elevated areas, more than 20 feet above the contaminated machine.

In addition, while other facilities had workers and customers who suffered from either cutaneous or inhalation anthrax, the death of a postal customer served by the Wallingford facility underlines the insidious nature of anthrax and the difficulty in determining a lethal dose, since the elderly Connecticut woman died from anthrax when no evidence of anthrax could be found in either her home or places she frequented.

To compound this, a single spore was found on a letter received by another postal customer in the community, and yet, no other illnesses or deaths in the community were reported.

Further, the Wallingford facility was outside the predictive analysis that the Postal Service performed to determine the impact on the rest of the postal distribution network of the contaminated letters processed through facilities in Washington, DC, and Trenton, NJ.

The unpredictability of both the lethality of anthrax and the route that contaminated mail might take, makes it extremely difficult to establish the health risks associated with a release of a biological agent such as anthrax inside a facility that serves the public.

This difficulty underscores the need for a standardized and aggressive response, as well as forward planning to protect facility workers and the public should an anthrax attack occur again.

As you know, determining whether or not a facility is contaminated with anthrax is critical. This is dependent upon one, the methods used for sampling, two, the locations from which samples were collected, and three, how many samples were collected.

The Postal Service's testing of the Wallingford facility originally used the dry swab method for sample collection and found no anthrax. After the death of the elderly Connecticut woman on November 21, 2001, the CDC and the Agency for Toxic Substance and Disease Registry used targeted sampling, focusing on the mail sorting machines and different sampling methods, wet wipes and HEPA vacuums. They also collected more than three times the number of samples previously collected by the Postal Service and found contamination in some of the samples.

This inability to initially find anthrax contamination shows that either qualitative, that is positive or negative, or quantitative, test results from a qualified laboratory cannot be used to establish a health risk. Positive results only show whether contamination is present in the samples collected. However, negative results do not necessarily mean that a facility is free from contamination. Quantitative test results only show the extent of contamination in the specific sample found to be positive, not how much anthrax is present in the facility.

For example, 3 million anthrax spores were found on one machine in Wallingford. However, with regard to the health risk to an individual, although this number was significantly higher than what was considered historically to be a lethal dose for an individual, 8,000 to 10,000 spores, CDC did not know how to extrapolate the amount in a sample to a person's risk for inhalation anthrax. The Environmental Protection Agency recently reported that in order to perform credible risk assessment, it is essential to identify the minimum number of spores needed to cause inhalation and cutaneous anthrax.

Nevertheless, there is now a consensus among the experts that a few spores could be harmful to a susceptible individual as may have been the case in the death of the Connecticut woman.

Public health response is most effective and efficient when it is proactive. When it focuses on prevention, rather on consequence management. Thus, the Wallingford incident illustrates the challenges facing the Federal Government, the State health departments, the network of diagnostic laboratories and those companies that serve the general public, including the Postal Service. The challenge can be summed up in one question. Is it safe?

This is what everyone asked during the fall of 2001 and this is what everyone is trying to answer to this day. Unfortunately, the best answer anyone can give is, it is probably safe. Once a building has been contaminated, one can never say there is no risk; but there can be a low risk but all those who are trying to protect the public health must realize that they are defining the risk level for others. In this case the postal workers as well as the general public.

The impact of additional anthrax cases could result in illness or loss of life, as well as loss of confidence in the Nation's postal system. Further, even though the health risk is probably low, it is uncertain. We are, therefore, recommending that the Postmaster General, in consultation with CDC, EPA, OSHA, as well as any other relevant agencies and postal unions, for those facilities that were deemed free of anthrax spores based solely on a single negative sampling result, that they: One, reassess the risk level for postal workers at those facilities and the general public served by those facilities; two, reconsider the advisability of retesting those facilities, employing the most effective sampling methods and procedures; and three, communicate to the postal workers and the general public the results of the assessment of health risk, the advisability of retesting, the rationale for these decisions and other relevant information that may be helpful regarding the health of the postal workers and the general public.

Mr. Chairman, this concludes our statement. My colleagues and I will be happy to answer any questions you or members of the subcommittee have.

[NOTE.—The GAO report entitled, "U.S. Postal Service, Better Guidance is Needed to Improve Communication Should Anthrax Contamination Occur in the Future," may be found in subcommittee files.]

[The prepared statement of Dr. Rhodes follows:]

United States General Accounting Office

GAO

Testimony

Before the Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform

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U.S. POSTAL SERVICE

Issues Associated with Anthrax Testing at the Wallingford Facility

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Physical Infrastructure Issues

GAO-03-787T

May 19, 2003

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Highlights

Highlights of GAO-03-787T, a testimony before the Subcommittee on National Security, Emerging Threats, and International Relations, House Committee on Government Reform

U. S. POSTAL SERVICE

Issues Associated with Anthrax Testing at the Wallingford Facility

Why GAO Did This Study

The anthrax attacks of 2001 resulted in 23 cases of the disease, 5 deaths, and the contamination of numerous U.S. Postal Service facilities, including the Southern Connecticut Processing and Distribution Center in Wallingford, Connecticut (the Wallingford facility). But none of the workers at the Wallingford facility contracted the disease from the anthrax contamination. As a result, GAO was asked to examine the adequacy of methods used to determine whether the Wallingford facility and other postal facilities were contaminated. In this testimony, GAO presents its preliminary findings concerning the test results for the Wallingford facility: (1) the collection of samples to detect anthrax, (2) the meaning of the test results, and (3) the communication of the test results to workers.

What GAO Recommends

In addition to its April 2003 recommendations, for those facilities that were deemed to be free of anthrax spores based solely on a single negative result, GAO recommends that the Postmaster General work with CDC, EPA, OSHA, and other relevant agencies, and union representatives to (1) reassess the risk level associated with contamination, (2) reconsider the advisability of retesting, and (3) communicate any relevant health-related information to postal workers and the public.

www.gao.gov/cgi-bin/getrpt?GAO-03-787T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Keith Rhodes, 202-512-6412, rhodesk@gao.gov.

What GAO Found

At the Wallingford facility, it took four attempts before anthrax contamination was eventually identified. The first two attempts by U.S. Postal Service contractors collected samples at various places in the facility, using dry swabs, the least effective method for sample collection. The Postal Service nationwide sampling plan required that contractors use dry swabs to collect anthrax samples at more than 280 facilities, including Wallingford. But the Centers for Disease Control and Prevention (CDC), in commenting on the plan, had recommended that the Postal Service use other sampling methods. Nevertheless, the Postal Service did not revise its sampling plan, and, with a few exceptions, has not retested the other facilities that had negative test results. In the third attempt, CDC and the Agency for Toxic Substance and Disease Registry also found no contamination using wet swabs, but in the fourth attempt—using wet wipes and HEPA vacuums to collect the samples—they found contamination in samples from mail-sorting machines.

Anthrax test results, whether qualitative (positive or negative) or quantitative, cannot be interpreted as a health risk, based on current scientific knowledge. Positive test results establish the presence of contamination, but only in the samples collected. Quantitative test results, although more definitive, only indicate the extent of contamination in the samples collected, not the amount present in the whole facility. Negative results, as the initial tests at the Wallingford facility demonstrated, do not necessarily mean that a facility is free from contamination. As EPA recently reported, knowledge of the "lethal dose" (the number of spores required to kill 50 percent of people exposed to airborne anthrax) is necessary for a credible health risk assessment. Although previous estimates of a lethal dose—8,000 to 10,000 spores—are being reconsidered, there is still no agreement on the lethal dose. However, some experts now agree that only a few spores could be harmful to a susceptible individual. As CDC also concluded, even with numbers of spores as high as those found in one sample from one mail-sorting machine at Wallingford—about 3 million spores—CDC did not know how to extrapolate the quantitative test results to an individual's risk for inhalation anthrax.

In an April 2003 report, GAO found that the Postal Service's communication of test results to workers at the Wallingford facility generally appears consistent with its guidelines. But the decision not to release the first positive quantitative test results, after a worker's union requested them, was not consistent with OSHA's requirement to disclose requested results. The Postal Service said it did not release the December 2001 quantitative results because it could not validate them, as required by its guidelines, which, however, do not define validation or use it appropriately. The Postal Service communicated the results to workers as "trace" and "a concentration of spores"—terms that did not provide workers with useful information needed to make health-related decisions. It has agreed to revise the guidelines as GAO recommended. Further communications appear warranted based on GAO's ongoing work.

May 19, 2003

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to present our findings on anthrax testing conducted by the U.S. Postal Service (USPS) and the Centers for Disease Control and Prevention (CDC) at the Southern Connecticut Processing and Distribution Center in Wallingford, Connecticut (the Wallingford facility). As you know, in September and October 2001, four letters containing anthrax spores were mailed to news media personnel and congressional officials. As a result, the letters contaminated numerous postal facilities and exposed several postal workers to anthrax.[1] Some of the workers became sick, and two died of inhalation anthrax. Three others also died from inhalation anthrax, including an elderly woman in Connecticut—a postal customer. After contamination was found in the Wallingford facility, a union official raised concerns regarding how postal managers communicated test results to workers. We have issued a report in this regard.[2]

Even though our analysis of the Wallingford incident is only one part of our larger study, it gives unique insight into the lessons that need to be learned from the response of the federal government, state health departments, and USPS to the anthrax attacks in the fall of 2001. All of these entities served either as direct responders or as advisors, or both; and all were creating or adapting guidelines as the crisis progressed. The situation was further complicated by an ongoing criminal investigation, coupled with a public health emergency.

The Wallingford facility was unique in that it did not directly handle the anthrax letters. Rather, it was cross-contaminated by them, with the largest number of

[1] Technically, the term "anthrax" refers to the disease caused by *Bacillus anthracis* and not the bacterium or its spores. In this testimony, we use the term "anthrax" for ease of reading and to reflect terminology commonly used in the media and by the general public.

spores being found in a sample collected from a single machine. There was, however, evidence that the spores had become airborne (re-aerosolized) since small numbers of spores were found in elevated areas—more than 20 feet—above the previously contaminated machines. In addition, while other facilities had workers and customers who suffered from either cutaneous or inhalation anthrax, the death of a postal customer served by the Wallingford facility underlines the insidious nature of anthrax and the difficulty in determining a lethal dose, since the elderly Connecticut woman died from anthrax when no evidence of anthrax could be found in either her home or places she frequented. To compound this, a single spore was found on a letter received by another postal customer in the community, and yet no other illnesses or deaths were reported. Further, the Wallingford facility was outside the predictive analysis (a mapping of the facilities predicted most likely to be contaminated) that USPS performed to determine the impact of the contaminated letters processed through facilities in Washington, D.C., and Trenton, New Jersey, on the rest of the postal distribution network. The unpredictability of both the lethality of anthrax and the route that contaminated mail might take, makes it extremely difficult to establish the health risks associated with a release of a biological agent inside a facility, such as anthrax, that serves the public. This difficulty underscores the need for a standardized and aggressive response, as well as forward planning, to protect facility workers and the public should an anthrax attack occur again.

As you know, determining whether or not a facility is contaminated with anthrax is critical. This is dependent upon the effectiveness of the methods used to detect anthrax. As a result, at your request, we are conducting a study to examine the adequacy of the methods used by involved contractors and federal agencies in determining whether postal facilities were contaminated. We will report the final results of this study at a later date.

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[2] U.S. General Accounting Office, *U.S. Postal Service: Better Guidance Is Needed to Improve Communication Should Anthrax Contamination Occur in the Future*, GAO-03-316 (Washington, D.C.: April 7, 2003).

In our testimony today, at your request, our remarks will focus on our preliminary findings regarding the test results for the Wallingford facility. Specifically, we will address the issues that arose concerning the following three areas: (1) the collection of environmental samples to detect anthrax contamination, (2) the meaning of the test[3] results from the samples (both qualitative and quantitative) with respect to the health risk of the workers, and (3) the communication of the test results. Our work thus far has involved interviews with officials from USPS, CDC, and experts in this area, reviews of relevant documents and literature, and review of the documents we were provided by USPS and CDC associated with the sampling done at the Wallingford facility during November 2001 through April 2002. We did not independently assess or verify any of the laboratory test results, sampling plans, or sampling methods to determine their adequacy or accuracy. Our work has been performed in accordance with generally accepted government auditing standards.

SUMMARY

Three issues emerged with regard to the collection of environmental samples at the Wallingford facility: (1) the methods used for sampling[4], (2) the locations from which samples were collected, and (3) how many samples were collected. USPS, in response to the anthrax attack of 2001, developed a plan to test over 280 facilities nationwide, including the Wallingford facility. This plan was precautionary and assumed that those facilities were probably not contaminated with anthrax. Further, this plan specified what sample collection methods to use, where to sample, and the number of samples to be collected, among other things. At the Wallingford facility, however, it took four attempts before contamination was eventually identified. USPS used its own contractors to collect a limited

[3] The terms "test" or "testing" refer to the laboratory analysis of the samples collected.
[4] Technically, the term "sampling" refers to a strategy to extract organisms that might be present in the environment. In this testimony, however, sampling refers to the number of samples collected, as well as other associated events, on a given day.

number of samples at various places in the facility.[5] In addition, USPS collected the samples using the dry swab method, which is the least effective method for collection of samples from surfaces. On November 9, CDC officials recommended that USPS use moistened swabs; however, USPS did not incorporate this recommendation into its sampling plan.[6] According to USPS officials, in the beginning, they mirrored the methods used by CDC in other postal facilities. USPS did not find contamination. However, after the death of the elderly Connecticut woman on November 21, 2001, CDC and the Agency for Toxic Substance and Disease Registry (ATSDR) eventually used targeted sampling, focusing on the mail-sorting machines, and different sampling methods—wet wipes and high efficiency particulate air (HEPA) vacuum. CDC and ATSDR, using a CDC-contracted laboratory, collected more than three times the number of samples previously collected by USPS and found contamination in some of the samples. Experts we consulted at the U.S. Army Medical Research Institute for Infectious Disease told us that before October 2001, they had found that dry swabs were ineffective at collecting spores and that spores could not be recovered efficiently from dry swabs. Finally, even though the contamination found at the Wallingford facility was unexpected, according to a USPS official, the nationwide plan was not revised because it was 60-days removed from the event, well past the perceived incubation period as far as health risk was concerned. This approach did not take into account the possibility that if spores are present in a facility, re-aerosolization can occur at any time if the site of contamination is disturbed. The USPS official also said that, with a few exceptions, he believed, of those facilities that had tested negative during the nationwide sampling, none had been retested. Thus, the negative findings from the first three sampling attempts at the Wallingford facility raise questions about the reliability of a single negative sampling result, especially one based upon the use of a method considered the least effective, as was the case in Wallingford.

[5] CDC officials told us that the number of samples collected on a given day was, in part, governed by the capacity of the state laboratories to process the samples.

Neither qualitative (positive or negative) nor quantitative test results from a qualified laboratory can be used to establish a health risk. Concerning qualitative results, positive results only show whether contamination is present in the samples collected. However, negative results do not necessarily mean that a facility is free from contamination. Quantitative test results only show the extent of contamination in the specific samples found to be positive—not how much anthrax is present in the facility. For example, in the Wallingford facility, the level of contamination found in a dust sample collected from a mail-sorting machine was about 3-million spores (5.5 million per gram of dust). However, with regard to the health risk to an individual, although this number was significantly higher than what was considered historically to be a lethal dose for an individual—8,000 to 10,000 spores—CDC did not know how to extrapolate the amount in a sample to a person's risk for inhalation anthrax.[7] EPA recently reported that in order to perform credible risk assessments, it is essential to identify the minimum number of spores needed to cause inhalation and cutaneous anthrax. Nevertheless, there is now a consensus among the experts that a few spores could be harmful to a susceptible individual, as may have been the case in the death of the Connecticut woman.

Three major communication issues arose at the Wallingford facility: (1) the timing of the release of the quantitative results; (2) reasons for USPS withholding the quantitative results from the workers, such as a lack of confirmation and validation of the test results; and (3) the terminology used to describe the extent of contamination to the workers. First, USPS did not communicate to the workers the quantitative test results of the November 28, 2001, test until 9 months after it received them, and it did not comply with the Occupational Safety and Health Administration (OSHA) regulations, which require the release of test results to workers after they are requested. But USPS generally communicated to

[6] USPS Draft Standard Sampling Plan dated November 9, 2001. USPS's Draft Interim Guidelines replaced this plan in late November 2001.

[7] It is important to note that the range of spores (8,000 to 10,000) for the human lethal dose was extrapolated from animal studies. This range of spores refers to a dose that will kill 50 percent of

the workers the qualitative test results (positive and negative) soon after they became available. Second, USPS officials told us that USPS did not release the quantitative test results because it could not validate the confirmed results, as required by its draft guidelines. However, these guidelines did not define either confirmation or validation. The use of the terms "confirmation" and "validation" in this context has caused confusion both about (1) the status of the methodologies used to detect anthrax and (2) the communication of test results to workers. The experts we consulted told us that, in their view, the terms confirmation and validation were not used appropriately in USPS guidelines, and CDC concurs with this view. The guidelines do not specify the process and methods for confirming test results. Validation is not done after a test or a procedure has already been performed, as would have been the case with the quantitative test result. Thus, according to the experts we consulted, validation, when used in this sense, should not have prevented USPS from communicating the quantitative test results. According to USPS officials, the term validation, as used in USPS guidance, was intended to be used more for quality assurance purposes. Finally, the terminology used by USPS after discussion with the chief epidemiologist of the Connecticut Health Department was not helpful to workers in assessing their risk. USPS communicated the quantitative results to workers as "trace" amounts and "a concentration of spores." These terms did not provide workers with useful information, when it was needed most, which was when they were making decisions regarding their health risk. Further, the lack of communication of the test results may have contributed to workers' inability to make informed decisions, such as whether to continue taking their medication or work at another facility. As OSHA noted, "Failure to effectively communicate issues, which can have an effect on a worker's health and safety, can lead to fear and mistrust."

Finally, USPS and the other federal agencies involved in the communication issues we raised responded positively to the recommendations we made in our

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individuals exposed to airborne anthrax. However, the lethal dose for a person could be a few spores, as

April 2003 report aimed at enhancing communication of test results. However, our preliminary work on testing approaches revealed three other issues that we believe need to be addressed. These are, for those facilities that were deemed to be free of anthrax spores based solely on a single negative sampling result, (1) the risk level for postal workers at those facilities and the general public served by those facilities, (2) the advisability of retesting those facilities—employing the most effective sampling methods and procedures, and (3) communication to postal workers and the general public of relevant information that may be helpful regarding their health. We are making recommendations to USPS to address these issues.

BACKGROUND

On or about October 9, 2001, at least two letters containing anthrax spores entered the U.S. mail—one was addressed to Senator Thomas Daschle, the other to Senator Patrick Leahy. Before being sent to the Brentwood facility in Washington, D.C.—the facility that processed mail to the two senators—the letters were processed on high-speed mail-sorting machines at a postal facility in Hamilton, New Jersey. The Hamilton facility—also known as the Trenton postal facility—processed mail that was to be transported to the Wallingford facility for further processing.[8] A study conducted in Canada in 2001 has shown that a contaminated envelope, when opened, may cause a substantial primary aerosol event, that is, particles become airborne. Also envelopes with the open corners not specifically sealed could also pose a threat to individuals in the mail handling system.[9]

The letters to the senators contaminated the Brentwood and Hamilton postal facilities and, according to USPS, resulted in the cross-contamination of some

may have been the case with the Connecticut woman.

[8]Two other contaminated letters were sent to a television news anchor and the editor of *The New York Post* in New York City on or around September 18, 2001. Although the letters were processed through the Hamilton (Trenton facility), it is not known whether these letters contaminated the Wallingford facility.

mail as it moved between these and other facilities in the postal system.[10] Cross-contaminated mail is believed to have been processed through the Wallingford facility on or around October 11, 2001. The possibility of cross-contamination and associated potential exposure to anthrax spores, contained in cross-contaminated mail that was processed at the Wallingford facility, went unrecognized until after the death of the Connecticut woman from inhalation anthrax on November 21, 2001. Airborne transmission of anthrax spores at the Wallingford facility and other facilities is believed to have been facilitated by the use of high-speed sorters, as well as compressed air, for routine cleaning of the mail-sorting machines.[11] As a result, USPS terminated the use of compressed air at all postal facilities on October 23, 2001.

Environmental testing and remediation for anthrax contamination in a facility consists of several steps: sample collection, laboratory identification, decontamination, and retesting. To collect samples, a sampling plan should be developed, which specifies, among other things, number of samples, specific methods to collect the samples, areas in which to sample, and instructions for submitting the samples to a qualified laboratory for analysis. A variety of sample collection methods were used in the Wallingford facility, including dry swabs, wet wipes, and HEPA vacuums. Swabs—either wet or dry—have small surface areas (similar to Q-tips®). They are typically used to sample small, nonporous surface areas (less than 100 sq. cm) that do not have a large accumulation of dust. Wet wipes--sterile gauze pads, approximately 3 inches square–are typically used for sampling larger (more than 100 sq. cm), nonporous surface areas. HEPA vacuum is a suction device with a nozzle—including a cone-shaped filtering trap or sock attached—to collect dust samples from a surface or the air. After samples have been collected, they are to be transported to a qualified laboratory for analyses.

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[9] B. Kournikakis, and others, *Risk Assessment of Anthrax Threat Letters*. Suffield: DRES Technical Report TR 2001-048, September 2001.

[10] USPS officials suspect that the source of the contamination that caused the elderly woman to contract anthrax was the October 9th set of letters processed at the Hamilton facility in New Jersey.

[11] Centers for Disease Control and Prevention, "Evaluation of *Bacillus anthracis* Contamination Inside the Brentwood Mail Processing and Distribution Center—District of Columbia; *Mortality and Morbidity Weekly Report* (2001), vol. 50, pp. 1129-1133.

A range of laboratory tests exists for detecting anthrax in a person's body and in the environment. However, analysis by the culture method is considered to be the gold standard for identifying anthrax. Qualified laboratories report anthrax test results either qualitatively (for example, as "positive" or "negative") or quantitatively (for example, as a specific number of colony-forming units (CFU)), [12] that is, living cells per gram or square inch of material sampled or in milligrams per micro liter.

USPS' SAMPLING APPROACH DID NOT IDENTIFY ANTHRAX AT THE WALLINGFORD FACILITY

USPS's initial sampling approach at the Wallingford facility was ineffective in that it did not detect contamination at the Wallingford facility as soon as was practically possible. If additional testing had not been done to determine the source of contamination for the death of the Connecticut woman from inhalation anthrax, it is possible that the contamination would have gone undetected. USPS guidelines specified the least effective method for sample collection. Assuming that there was probably no anthrax contamination, USPS, as part of its nationwide testing of over 280 facilities, initially used a precautionary approach to determine whether those facilities, including the Wallingford facility, were contaminated.[13] This approach included a method—dry swabs--considered to be the least effective for sample collection, based on comparative studies and the opinions of experts we consulted. This approach did not find contamination (negative results) in the Wallingford facility. On the other hand, CDC used an approach at the Wallingford facility that included a combination of more effective methods—wet wipes and HEPA vacuum—with which contamination was found. Further, USPS officials told us that based on their mail-tracking system, they identified some postal

[12]The term "colony-forming units" refers to the number of living cells in a sample and is typically reported per gram of material sampled for HEPA vacuum samples and per square inch for samples collected using wipes.

[13]Facilities in Florida, New Jersey, New York, and Washington, D.C., had already been tested and found contaminated.

facilities that they considered likely to have been contaminated by anthrax letters processed through those facilities.[14] However, Wallingford was not one of these. The negative test results for the sampling at the Wallingford facility must, therefore, cast doubt about the true extent of contamination in other facilities that tested "negative."

As part of its approach, USPS used its draft Standard Sampling Plan, which specified a minimum number of samples to be collected from various areas, using the dry swab method.[15] USPS used four contractors to sample the Wallingford facility. These contractors were previously contracted to conduct routine environmental sampling for such substances as air and water, rather than dealing with unusual and dangerous bacteria such as anthrax. Before the Wallingford facility was tested, USPS and CDC had learned that some of the mail-sorting machines in the facilities that processed the letters containing the anthrax powder—for example, the Brentwood and Trenton facilities—were found to be heavily contaminated. This suggests that mail-sorting machines would be a likely starting point for sample collection.

On November 11, 2001, using a contractor, USPS collected 53 samples from various sites throughout the facility using dry swabs. The test results were negative. Although USPS, as part of its nationwide sampling, had only intended to test the facility once, it retested the facility on November 21, the day that the elderly Connecticut woman died, to determine the possible source of contamination. On November 21, USPS attempted to identify the path the contaminated letter would have taken. USPS collected 64 samples from surfaces where mail was processed and from air-circulating units, using dry swabs. Again the test results were negative. The November 25, 2001, testing by CDC and the

[14] According to USPS, to determine the condition of sites of possible contamination and to evaluate specific downstream sites throughout the country, USPS obtained test equipment, systems, and contract services. When testing was completed in late November 2001, 284 facilities were tested, with 23 positive and 261 negative results.

[15] USPS contractors used the USPS Draft Standard Sampling Plan, dated November 2 and 9, 2001. The draft USPS interim guidelines, dated November 16, 2001, replaced this plan, and a subsequent version of the guidelines was issued December 4, 2001.

ATSDR, while using a different method—wet swab—also collected 60 samples, of which 8 were from mail-sorting machines. Again, the results were negative. Of the 177 samples collected during the November 11, 21, and 25 samplings, 15 samples were collected from the facility's 13 mail-sorting machines. The Connecticut Public Health Laboratory analyzed all of these samples. In addition, according to CDC officials, the numbers of samples collected on the above dates were, in part, influenced by the capacity of the Connecticut Public Health Laboratory. (See table 1 for sampling details.)

Table 1: Summary of Sampling for Anthrax Contamination between November 2001 and April 2002 and the Associated Test Results for the Wallingford Facility

Sampling date	Method used	No. of samples (Samples collected from mail-sorting machines)	Test results		Agency collecting samples [a]
			Qualitative (No. positive)	Quantitative	
Five tests performed during initial period of contamination					
11/11/01	Dry swabs	53 (1)	Negative	N/A	USPS
11/21/01	Dry swabs	64 (6)	Negative	N/A	USPS
11/25/01	Wet swabs	60 (8)	Negative	N/A	CDC
11/28/91	Wet wipes and HEPA vacuums	212 (130)	Positive (6)	3 million CFU/0.55 gram[b] 370 CFU/gram	CDC
12/2/01	Wet wipes	200 (200)	Positive (35)	N/A	CDC
Test (precautionary) performed in high-bay areas[c]					
4/21/02	HEPA vacuums	101 (N/A)	Positive (3)	1 colony from 7.50 gram sample material 10/11 colonies from 7.69 gram sample material 13/18 colonies from 5.67 gm sample material	USPS

Source: GAO (summary), USPS, and CDC (data).
[a]The USPS used a contractor; CDC was assisted by the Agency for Toxic Substances and Disease Registry.

[b]The sample collected contained 0.55 gram of material (dust) from the heavily contaminated machine. The laboratory adjusted its analyses to reflect a full gram of sample material and reported the presence of 5.5 million CFUs per gram, which the chief epidemiologist subsequently determined, through extrapolation, to be 2.9 million CFUs—or about 3 million spores— in the sample. In this testimony, we refer to the 2.9 CFU for the 0.55 grams of sample material actually collected.

[c]"High-bay" areas refer to elevated areas in the facility such as pipes, ducts, joists, beams, and overhead conveyors. Precautionary testing was performed to ensure no anthrax was present during annual cleaning.

Note: N/A = Quantitative data either not applicable (no anthrax present) or not provided.

On November 28, CDC and ATSDR performed what they termed "targeted" testing, based upon new information concerning which mail-sorting machines were likely to have processed the woman's mail. CDC and ATSDR collected 212 samples using a combination of methods: wet wipes and HEPA vacuums, rather than the wet swabs CDC had previously used. This time, CDC and ATSDR collected 130 samples from the mail-sorting machines as opposed to the 15 samples collected during the three prior sampling efforts. A CDC-contracted laboratory analyzed the samples and found 6 that were positive for anthrax, 2 of which had been collected by HEPA vacuum and four by wet wipes. For the November 28 samples, the laboratory also provided two quantitative results, one of which, according to the Connecticut chief epidemiologist, was about 3 million CFUs of anthrax (that is, 5.5 million CFUs per gram of dust) in a sample collected from a heavily contaminated mail-sorting machine.

Finally, on December 2, while the contaminated machines were isolated and the process of decontamination was beginning, CDC and ATSDR used wet wipes alone to collect 200 follow-up samples from the machines to determine the extent of contamination on the machines and found 35 additional positive samples. On April 21, 2002, a USPS contractor, in consultation with CDC, OSHA, EPA, and the Connecticut Department of Public Health—using HEPA vacuums—tested elevated, or high bay, areas above the previously contaminated machines. The sampling was performed because of a USPS requirement for testing prior to the routine cleaning of elevated areas in facilities that had previously tested positive for anthrax. The effort was undertaken to protect workers from the possibility of exposure to spores that may have blown into these areas as a result of USPS's prior use of compressed air to clean its facilities. The results revealed from 1 to 18 CFUs in 3 of 101 samples collected from the elevated areas.[16] This finding indicates that spores had been airborne at some period in the facility.

[16] Specifically, the test results indicated (1) 1 CFU from 7.50 grams of material sampled, (2) 10 CFU and 11 CFU from 7.69 grams of material sampled, and (3) 13 CFU and 18 CFU from 5.67 grams of material sampled.

Based on the testing done at the Wallingford facility by USPS and by CDC and ATSDR, neither dry nor wet swabs alone identified anthrax contamination in the samples collected. Wet wipes and HEPA vacuums did identify anthrax in some samples. Experts we consulted at the U.S. Army Medical Research Institute for Infectious Disease told us that before October 2001, they had found that dry swabs were ineffective at collecting spores. CDC, on November 9, 2001, in commenting on USPS draft guidelines, recommended that USPS use sterile swab samples for environmental sampling and that these swabs be moistened with sterile water. In addition, CDC informed USPS that CDC's own draft procedures, that is, "Procedures for Collecting Environmental Sampling for Culturing Bacillus *anthracis*," continued to address bulk and vacuum samples. CDC draft guidelines did not, however, address the use of wet wipes. CDC also stated that, "some of the state labs may be less familiar with the methods needed to perform analyses for vacuum and bulk samples." Finally, CDC stated that it understood that USPS' sole use of the swab method was related to an accommodation reached with the Association of Public Health Laboratories to more effectively use state health department laboratories to assist with sample analysis. USPS also acknowledged in a subsequent draft of its guidelines that, "the Association of Public Health Laboratories does not recognize air, bulk, or HEPA vacuum for purposes for Bacillus *anthracis* identification."

USPS officials we interviewed said that in the beginning, USPS mirrored the methods used by CDC in the Brentwood and Trenton facilities. The officials noted that, at one point, "one method was recommended, and later, another method was recommended." USPS officials also told us that in the absence of any other guidance, they were attempting to use pre-existing guidance and extrapolate it to a bio-terrorist attack. In December 2001, a study carried out by CDC, ATSDR, and USPS clearly showed that sampling methods differed significantly in their ability

to detect spores, even in a heavily contaminated facility.[17] According to the study, dry swabs failed to detect spores more than 86 percent of the time, wet swabs more than 46 percent, HEPA more than 20 percent, and wipes more than 13 percent. Based on the study, CDC concluded that dry swabs should not be used to sample for anthrax. Finally, a report by the EPA, dated February 2003, on environmental sampling for anthrax spores at USPS Morgan Postal and Processing facility stated that wipe samples should be used for sampling large surface areas, and wet techniques are more effective than dry techniques. The report stated that epidemiological approaches for different scenarios of environmental sampling should be developed.[18] These issues raise questions about the reliability of a single "negative" sampling result, especially based on the least effective method—dry swabs—as was the case initially in Wallingford.[19]

TEST RESULTS CANNOT BE USED TO DETERMINE HEALTH RISK FOR WORKERS

Neither qualitative (negative or positive) nor quantitative tests results can be used to definitively establish the risk to an individual's health. Interpreting positive test results from a sample as a health risk would require a real understanding of the physical behavior of airborne anthrax spores as well as factors that may influence their behavior. Thus, while both qualitative and quantitative test results from a qualified laboratory can show that a facility is contaminated, they do not show the actual extent of contamination in the facility or the health risk for workers. In particular, qualitative test results show if a facility is contaminated or not. Further, while quantitative test results show the number of CFUs in a sample, such results can be difficult to interpret and, possibly misleading, depending upon the relative distribution of surface dust versus spores and the effectiveness of the

[17] See CDC, "Surface Sampling Methods for *Bacillus anthracis* Spore Contamination," *Emerging Infectious Diseases Journal*, Vol. 8, No. 10 (October 2002).
[18] U.S. Environmental Protection Agency: Summary Report: Peer Review Workshop on Environmental Sampling for Anthrax Spores at Morgan Postal Processing and Distribution Center, May 30, 2002, New York City, New York. (EPA 500-R-03-001, Washington, D.C., February 2003).
[19] USPS officials told us that they are in the process of revising their interim guidelines, however, we have not yet reviewed these revised guidelines.

sampling methods. Nevertheless, because of factors affecting how well a sample method picks up anthrax and limitations affecting the amount of anthrax that can be extracted from that sample, experts agree that there would be more anthrax in the facility than can be picked up by a sample. However, according to officials from the U.S. Army Medical Research Institute for Infectious Disease, what is most important is not the number of spores in a sample but whether or not any spores exist. On the other hand, EPA recently reported that in order to perform credible risk assessments, it is essential to identify the minimum number of spores needed to cause inhalation and cutaneous anthrax.

Negative test results, as shown at the Wallingford facility, do not necessarily mean that a facility is free from contamination. Test results at a contaminated facility could be negative if (1) the sampling method used was not sufficiently effective; (2) samples were not collected from places where contamination was actually present; and (3) an insufficient number of samples were collected. Concerning the sampling methods used in the Wallingford facility, for example, the samplings conducted on 3 different days, which involved collecting a limited number of samples from various places in the facility, using either dry or wet swabs, came out negative, while a subsequent sampling—which used (1) a combination of sampling methods, (2) a different sampling approach, and (3) an increased number of samples—came out positive. It is, therefore, essential to have a sound sampling plan that includes effective methods and do repeat testing if it is considered necessary.

Once contamination is confirmed, actions must be taken to protect the workers and decontaminate the facility. Interpretation of the positive test results requires a real understanding of the physical processes involved in generating airborne particles, such as anthrax; the behavior of such particles; and the factors that influence their behavior. Evaluation of the health risks involves the assessment of components that govern the particle-size profile, stability, and biological impact. The greatest risk to a worker's health in the Wallingford facility appears to have

come from the particles that became airborne as mail that had been cross-contaminated passed through the sorting machines. In the case of the Wallingford facility, postal officials suspect that contamination of the facility may have occurred a few days after October 9, when the second set of letters, those addressed to the two senators, passed through the Trenton facility. It is likely that this high-risk period would have been no more than a few hours, while spores were still airborne. Nevertheless, once spores have settled, a risk can arise if spores again become airborne, thus making it possible for workers to inhale them.

Investigations of anthrax contamination in the U.S. Senate Office building found that simulated day-to-day office activities (that is, paper handling, foot traffic, mail sorting, trash container movement, patting chairs) resulted in spores again becoming airborne. Eighty percent of these airborne particles were in the size range 0.9 to 3.5 microns and, thus, would be capable of causing inhalation anthrax.[20] It was noted that even minimal movement caused viable spores to become airborne. It is therefore very likely that compressed air, used for machine cleaning, could provide sufficient energy to cause particles to become airborne, particularly from areas where there are high local concentrations of spores, as was the case in Wallingford. Similarly, the processing of a cross-contaminated letter through a sorting machine may also provide sufficient energy to cause spores to again become airborne. Based on these findings, it is important to recognize that in a mail-processing facility that has tested positive for anthrax, there is a risk to the health of workers because spores may become airborne again after the primary event—the passage of the contaminated letters—has occurred. In addition, these spores could then create a risk of cross-contamination of mail.

USPS asked CDC whether it should conduct additional testing of postal facilities to assure workers safety. On February 25, 2002, in its response, CDC stated that additional testing was not warranted at that time. CDC noted several reasons for not retesting those facilities including, (1) qualitative or quantitative testing for

anthrax does not accurately correlate with exposure threshold or predictors of disease at these work sites; (2) since the initial contamination, there has been no report indicating increased risk for disease among the workers at these sites; and (3) there is a good reason to believe that the risk for workers has decreased since the initial attack as a result of USPS's newly adopted prevention and control measures, such as repetitive machine decontamination, medical monitoring, and revised operating and maintenance procedures.

According to the experts, the level of contamination found at the Wallingford facility was significantly higher than the level—8,000 to 10,000 spores—historically considered likely to cause disease in the individual when inhaled in a fine powder form. However, there is now a consensus among the experts that even a few spores could be harmful to a susceptible individual, as may have been the case in the death of the Connecticut woman. According to officials from the U.S. Army Medical Research Institute of Infectious Disease, what is most important is not the number of spores in a facility but whether or not any spores are found.

In an attempt to lessen the risk that spores might become airborne, USPS stopped the use of compressed air for cleaning mail-sorting machines and also revised its cleaning methods to include those less likely to cause spores to be blown about the facility, for example, wet mopping instead of dry brushing.

USPS'S FAILURE TO RELEASE QUANTITATIVE RESULTS CAUSED COMMUNICATION PROBLEMS AT THE WALLINGFORD FACILITY

USPS generally provided the Wallingford facility's test results to workers at the facility within 1 day of receiving the results, consistent with USPS guidelines requiring that workers be notified "as soon as possible." However, USPS did not inform the workers as promptly after contamination was identified in the facility

[26] C.P. Weiss and others, "Secondary Aerosolization of Viable Bacillus *anthracis* Spores in a Contaminated

in December 2001, and it also did not promptly provide information to workers on the quantitative test results after a union official requested them.

On December 2, 2001—when anthrax contamination was first identified in the facility—USPS met with workers to inform them that "trace" amounts of anthrax had been found in samples collected on November 28. Knowing that the laboratory initially identified a small number (one or two CFUs) of anthrax spores, the chief epidemiologist for Connecticut—who helped lead the investigation—told district postal managers that it would be accurate to use the term "trace" to describe the extent of contamination. On December 12, 2001—2 days after district postal managers said they received written confirmation of the presence of about 3 million spores in one of the samples collected on November 28 and, possibly, 4 days after headquarters postal managers received the results—district postal managers told us that they informed workers of the following: While trace amounts of anthrax existed on three mail-sorting machines, a "concentration" of spores had been identified in a sample collected from a fourth machine. But it was not until 9 months after USPS had received the quantitative results of the November 28, 2001, testing that it provided the information to the workers.

According to USPS, it did not release the quantitative test results to workers because it could not validate the confirmed results, as required by its guidelines, which state that results cannot be released until confirmed data are received from CDC or a state public health laboratory. However, the guidelines do not define the meaning of either "confirmation" or "validation," nor do they specify the steps that must be taken to validate test results. According to USPS managers, USPS could not ensure that the sampling had been done in accordance with procedures specified in the guidelines and, thus, could not validate the results, as required by the guidelines.[21] A USPS headquarters' manager told us that the term validation

U.S. Senate Office," *Journal of American Medical Association*, vol. 288 (2002), pp. 2853-2858.
[21]U.S. Postal Service, *Interim Guidelines for Sampling, Analysis, Decontamination, and Disposal of Anthrax for U.S. Postal Service Facilities* (Dec. 4, 2001). These guidelines were developed as the anthrax

was intended to describe a method for ensuring that work had been done in accordance with USPS' sampling and testing procedures and for coordinating the release of validated results. A USPS official also told us that the term validation, as used in USPS guidance, was intended to be used more for quality assurance purposes. The guidelines do not specify who is to do the validation or how it is to be done, particularly when the testing is not done or sponsored by USPS. Thus, the use of the terms confirmation and validation in the context of USPS guidelines has caused confusion about (1) the status of the methods used to detect anthrax (e.g., were the methods appropriately used) and (2) whether and when test results were to be communicated to workers.

The experts we consulted told us that, in their view, the terms confirmation and validation were not used appropriately in USPS guidelines. Confirmation is a process in which a qualified laboratory, using specific tests, determines the presence of anthrax in a sample. Normally, validation is a process that is carried out before a test or procedure is used for a specific purpose to ensure that such a test or procedure is effective. Thus, according to these experts, validation is not usually done after a test or a procedure has already been performed, as would have been the case had the results been validated in the manner described by USPS officials. Thus, according to the experts we consulted, validation, when done appropriately, should not have prevented USPS from communicating the quantitative test result.

These experts also (1) told us that the sampling method (HEPA vacuums) used to collect the samples that were quantified was appropriate and (2) agreed that the lack of documentation about the extent of surface area sampled, especially given the complexity of the facility's mail-sorting machines, could have made interpretations of the results difficult.[22] They explained that the method of

crisis unfolded, with input and guidance from several federal agencies, including CDC and OSHA, and the national unions that represent postal workers.

[22]We consulted with numerous experts in the field of microbiology, including Dr. Jack Melling, former Director and Chief Executive Officer of the British Center for Applied Microbiology Research, Porton Down; Dr. Paul Keim, Professor in Microbiology, Northern Arizona University; Col. Eric Henchal,

counting CFUs is a long-standing, definitive, and universally accepted microbiological technique for determining the amount of bacteria in a given sample, including anthrax. The results show how many spores have replicated to form colonies, which can then be seen by the naked eye. Thus, regardless of the sampling issues at Wallingford, none of the agencies involved provided any evidence indicating that the number of CFUs identified by the laboratory was incorrect.

USPS communicated the quantitative results to workers as "trace" amounts and "a concentration of spores," based on discussions with the chief epidemiologist of the Connecticut Health Department. However, according to the experts we consulted, use of the terms trace amounts or concentration of spores did not provide workers with useful information, when it was needed most, which was when they were making decisions regarding their health risk.

According to experts we consulted, the use of the term "concentration" to convey the finding of about 3 million spores in one sample may have been misleading because it did not adequately convey the potential health risk associated with the sample, along with any limitation associated with the results. The experts also said that providing information about the actual test results to workers would have given them better information for making informed medical decisions. In this case, according to the experts we consulted, an appropriate way to communicate the results to workers would have been to indicate that 2.9 million CFUs (from 0.55 grams of dust) were found in a sample from one machine, along with appropriate limitations regarding the sampling procedures used.

Following a request for test results by a union leader and an investigation by OSHA, USPS eventually released the quantitative results 9 months later. The delay was not consistent with OSHA regulations. OSHA did not cite USPS for failure to disclose the quantitative test results within 15 working days of the union leader's

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Department of the Army; and Dr. Barbara Johnson, former Safety Officer at the Dugway Proving Grounds,

January and February 2002 requests; however, in an October 7, 2002, letter to USPS, OSHA noted that a "failure to effectively communicate issues which can have an effect on a worker's health and safety, can lead to fear and mistrust."

In addition, two federal guidelines, developed in 2002 by GSA and the National Response Team, suggest that more—rather than less—information should be disclosed. For example, GSA's guidelines emphasize the need for "timely, clear, consistent, and factual" information, including any limitations associated with the information, so that people can make informed decisions. The other set of guidelines, developed by the National Response Team, warns agencies not to withhold information because it could affect the agency's credibility. However, neither USPS's guidance nor the more recent federal guidelines fully address the communication-related issues concerning anthrax that developed at the Wallingford facility. For example, none of the guidelines specifically require the full disclosure of all test results, including quantitative test results. Likewise, OSHA regulations for communicating test results to workers do not address the need for full, immediate, and proactive disclosure. Thus, we made several recommendations to minimize the likelihood that the communication-related problems at the Wallingford facility will recur elsewhere (see appendix I). USPS, EPA, and GSA generally agreed with our recommendations affecting them, but OSHA did not comment on our recommendation to it.

Our work to date on this study has revealed three other issues that we believe need to be addressed. These are, for those facilities that were deemed to free of anthrax spores based solely on a single negative sampling result, (1) reassessing the risk level for postal workers at those facilities and the general public served by those facilities, (2) reconsidering the advisability of retesting those facilities—employing the most effective sampling methods and procedures, and (3) communicating to the postal workers and the general public the results of the reassessment of health risk, the advisability of retesting, the rationale for these

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Department of the Army.

decisions, and other relevant information that may be helpful regarding the health of the postal workers and the general public.

CONCLUSIONS

The Wallingford incident gives unique insight into the lessons that need to be learned from the response of the federal government, state health departments, and USPS to the anthrax attacks in the fall of 2001. The unpredictability of the lethality of anthrax; the broad spectrum of the population at risk of exposure, including postal workers, postal customers and others; and the inability to determine the route that contaminated mail might take as well as the extent of cross-contamination, are all factors that make it extremely difficult to establish the health risks associated with a release of a biological agent, such as anthrax, inside a facility that serves the public. This difficulty underscores the need for a standardized and aggressive response as well as forward planning to protect both the workers and the public should this happen again.

When considering the testing approach taken, and the methods used, to detect anthrax in postal facilities in the fall of 2001, it is important to recognize that the knowledge and experience of public health officials and others in this area were continually evolving. Experts we consulted and studies we reviewed indicated that the use of dry swabs alone were the least effective method of detecting anthrax. In addition, CDC recommended that dry swabs should not be used for anthrax detection. Initial sampling of the Wallingford facility, using USPS nationwide sampling guidelines (which provided for the use of dry swabs), did not find contamination. Also, use of the same guidelines to conduct nationwide testing may not have identified anthrax contamination that could have existed in some of those facilities that tested negative using dry swabs alone.

In February 2002, CDC advised USPS, that to ensure worker safety, there was no need to retest postal facilities for a variety of reasons. Accordingly, USPS followed CDC's advice and did not retest any of those facilities. However, in our discussion with CDC officials, they agreed that there are many uncertainties associated with anthrax risk assessment. For example, we do not know the lethal dose for an individual, how to extrapolate contamination in a facility to a health risk for an individual, and whether postal facilities still contain spores, and the reliability of the methods used to rule out anthrax contamination. CDC also agreed that there could still be spores in some facilities. Consequently, there remains a risk, albeit probably low, of further infection. While CDC judges the risk to be low, we believe that it is important that this judgment of the risk be communicated to workers and the general public so that they are in a position to make informed decisions about their health and safety.

Public health response is most effective and efficient when it is proactive, when it focuses on prevention, rather than on consequent management. Thus, the Wallingford incident illustrates the challenges facing the federal government, the state health departments, the network of diagnostic laboratories and those companies that serve the general public, including USPS. The challenge can be summed up in one question, "Is it safe?" This is what everyone asked during the fall of 2001, and this is what everyone is trying to answer to this day. Unfortunately, the best answer anyone can give is, "It is probably safe." Once a building has been contaminated, one can never say there is no risk, but there can be a low risk. What all those who are trying to protect the public health must realize is that they are defining the risk level for others: in this case, the postal workers as well as the general public.

RECOMMENDATIONS

The impact of additional anthrax cases could result in illness or loss of life as well as loss of confidence in the nation's postal system. Further, even though the health risk is probably low, it is uncertain; we therefore recommend that the Postmaster General, in consultation with CDC, EPA, OSHA, as well as any other relevant agencies and postal unions, for those facilities that were deemed to free of anthrax spores based solely on a single negative sampling result, (1) reassess the risk level for postal workers at those facilities and the general public served by those facilities, (2) reconsider the advisability of retesting those facilities and employing the most effective sampling methods and procedures, and (3) communicate to the postal workers and the general public the results of the reassessment of health risk, the advisability of retesting, the rationale for these decisions, and other relevant information that may be helpful regarding the health of the postal workers and the general public.

Mr. Chairman, this concludes our statement. We will be happy to answer any questions you or members of the Subcommittee may have.

CONTACTS AND ACKNOWLEDGMENTS

Should you or your offices have any questions concerning this report, please contact me at (202) 512-6412 or Bernie Ungar at (202) 512-2834. We can also be reached by e-mail at rhodesk@gao.gov and ungarb@gao.gov. Individuals making key contributors to this testimony were Don Allison, Hazel Bailey, Latesha Love, Laurel Rabin, Cady Summers, and Kathleen Turner. Drs. Jack Melling and Sushil Sharma provided technical expertise.

Appendix I

RECOMMENDATIONS CONTAINED IN OUR APRIL 2003 REPORT ON THE WALLINGFORD FACILITY

To help prevent the recurrence of the communication problems that occurred at the Wallingford facility, we recommended that the Postmaster General; the Administrator of the General Services Administration; and the Administrator of the Environmental Protection Agency, as Chairperson of the National Response Team, work together to, where applicable, revise guidelines to

- require prompt communication of test results, including quantified results when available, to workers and others;
- specify the terminology that should be used to communicate quantitative test results to workers and others (e.g., the number of colony-forming units per gram or square inch of material sampled) and any limitations associated with the test results;
- define what is meant by the validation of test results and explain the steps that must be taken to validate sampling or testing methods that are undertaken by the agency itself or by another organization;
- specify the actions that should be taken if test results cannot be validated, including a strategy for communicating unvalidated results;
- specify the agencies that should be involved in deciding what to communicate to workers and others, as appropriate;
- require documentation of the basis for decisions made, including the (1) advice the organization receives from public health officials and others about the communication of health-related information to workers and others, as appropriate, and (2) specific content of what agencies and other organizations communicate to workers and others; and
- reflect the Occupational Safety and Health Administration's regulations for disclosing test results requested by workers or their designated

representatives.

In light of new concerns about the possibility and impact of future terrorist actions using unforeseen hazardous substances, we also recommend that the Assistant Secretary for Occupational Safety and Health consider whether the Occupational and Health Administration regulations should require—in emergency situations—full and immediate disclosure of test results to workers, regardless of whether the information is requested by a worker or his or her designated representative.

(460533)

Mr. SHAYS. Thank you Dr. Rhodes.

Dr. Hamilton, you're going to want to lower the mic, and it is the silver one that you speak into.

Dr. HAMILTON. Thank you good afternoon. Thank you, Mr. Chairman, for the opportunity and members of the subcommittee.

My name is Robert Hamilton, and I am professor of medicine and pathology at John Hopkins University School of Medicine. I am also the director of the Dermatology, Allergy and Clinical Immunology [DACI], Reference Laboratory which is at John Hopkins University.

I'm speaking to you today as an academic scientist, an individual who was not directly involved in the anthrax events. However, my group became pulled into this issue when, in fact, this simple vacuum collecting device was, in fact, used in the Brentwood and the Wallingford facilities to collect surface dust and, we developed this and applied this collector about 10 years ago to the sampling of indoor environments for homes of children with asthma and allergies for assessing indoor allergens. So the question about the applicability of this to indoor anthrax assessment was of great interest to us.

I'd like to start by introducing the concept of the environmental surface testing a system in which a sample is collected from a surface, and then it's transported into the laboratory where it is extracted from the specimen, it's analyzed by one of a variety of ways, and then its results are reported.

Now, in each one of these four components, I think we can do better at improving the methodologies that we used, and I'll try to give you some illustrations as I go through this presentation.

Let us focus on the first issue of how sensitive were the methods that were available. It's our opinion and I've presented my conceptions, and—I collaborated with Barry Skolnick, who has actually developed a "show and tell" of these methodologies if, in fact, you wish to see them later.

It's our intention that, in fact, we really cannot answer, in fact, how sensitive these methods are because we have really never had positive controls, samples that tell us that, in fact, the methodology is either valid and have helped us in assessing the reproduceability of these methods. So I don't think at this point, based on the data that are in the literature, that we can actually answer the question of how sensitive these methods really are.

We do have some experience from NASA using some of their surface wipe testing procedures of spacecraft that give us a feeling for what technology pushed to its limit can do, but as to the methods that are actually used, I'm not sure we can actually answer that question.

As to the second component of your questions, which were how appropriate were the protocols and what can we learn from Wallingford, I have three areas, that brings me into three areas of recommendations that I'd like to leave with the committee and those can be summarized in essentially four words.

The first is leadership. The second is support, and the third is peer review.

Now, in terms of leadership, we need a single Federal agency to take responsibility for overseeing the characterization, the improvement and the validation of the diagnostic, the surface collection

testing methods that we have available; and I'm focusing on surface because I think, in the government, they have focused very well on optimizing air borne sampling, but it wasn't the air borne samples in these facilities that gave us the real information. It was the surface specimens that allowed us to make these decisions. As an illustration, we probably wouldn't have used dry swabs in the postal facility based on the protocol used by the U.S. Postal Service if, in fact, we really had a leadership organization that was saying, well, the CDC recommends wet swabs; why, and well, let us get together and develop a consensus, and they would have found out that wet swabs were improved, and they probably would not have used dry swabs. So that was an issue of leadership in my opinion.

A second issue could be focused on what units were used to report the results. Results were reported in "colony forming units per gram." Now, in allergy testing, that makes all the sense because that's the way that we report results, but in terms of assessing lowering a burden within the environment, on a particular instrument or piece of equipment, "colony forming units" per area or total burden is more relevant. So the way that the results were reported would have probably been different if we had a leadership—an agency that oversaw the consensus building of a protocol.

The second point, I'd like to focus on is support. In preparing a couple of research grants and submitting them to a variety of agencies, we have been unable to identify no obvious extramural support mechanism for individuals who are outside government, such as academics and industrial scientists, who have ideas that can help improve the methodologies to actually find funding for our ideas.

And so I'd like to suggest that we need improved focus on support, both financial and resources, to focus on the issue of developing a consensus guideline that ultimately allows us to have validated methods.

The third area is peer review. Coming from an academic environment, I feel that an open discussion of issue is extremely important to getting good ideas out. I realize there's a national security issue here with some proprietary concepts that can't be discussed in public, but by opening up peer review, we probably would have learned more about the existing methodologies that NASA's already created but have shown us the way to, possibly, improving the wipe-rinse aid that, in fact, the CDC ultimately used to identify spores in the Wallingford facility.

So again, to emphasize, I believe we need a single agency that will help us in developing and bringing all of the governmental scientists, and we have great technical capability in our government together, and along with support from the academic community, of which we're one of many, individuals who have ideas of how to improve methods and industrial concerns that, in fact, have technologies that could be applied, I feel that and with the support, the financial and the resource support, and with open peer review, where we can discuss and develop these ideas and develop a consensus, that we can actually develop methods with very little additional effort which, in fact, will allow us to adequately deal with any potential threat in the future with regard to anthrax.

With that, I'd like to close my remarks, and thank you for the opportunity, and I'm open to questions if you wish.

Thank you.

[The prepared statement of Dr. Hamilton follows:]

Testimony of Robert G. Hamilton, Ph.D.

Subcommittee of National Security, Emerging Threats
and International Relations

Committee on Government Reform

U.S. House of Representatives

May 19, 2003

Introduction

Good Afternoon, Mr. Chairman and members of the Committee. My name is Robert Hamilton and I am a Professor of Medicine and Pathology at the Johns Hopkins University School of Medicine in Baltimore. I also the director of the Johns Hopkins Dermatology, Allergy and Clinical Immunology (DACI) Reference Laboratory. Thank you for the invitation to speak to you regarding the environmental testing methods for anthrax detection, and the lessons that we can learn from Wallingford.

I am speaking to you today as an academic scientist who was not directly involved in the anthrax-associated events. However, my group at Johns Hopkins was drawn into the anthrax testing issue when this vacuum collector was used in the "rule out" detection of anthrax contamination at the Brentwood and Wallingford postal facilities. More than a decade ago, we participated in the development and application of this vacuum-collection device (sometimes called a "filter sock"). Our application of this device over a decade has been for surface dust collection in homes and schools. We process and analyze the collected dust for dust mite, cat, dog, cockroach, mouse, rat and mold spore aeroallergens in homes and schools of asthmatic children.

In consultation with my colleague Barry Skolnick, we have identified a number of technical issues that relate to the performance and extent of validation of environmental testing methods that were used to assess the postal facilities and congressional offices for anthrax. In my testimony, I will refer to a number of "environmental surface-testing systems". By this term, I mean overall procedures which share *four* integrated components. First, a surface is *sampled* at a site using a swab, wipe, or vacuum-based collection method (Table 1). Then these are transferred to a laboratory where the dust or particulate specimen is *extracted* from the collector, *analyzed* for bacterial spores, and the data are *reported*. I will refer to specific issues related to a number of these components of the environmental surface-testing system.

My comments today will refer only to environmental testing systems that use culture-based analytical methods for viable anthrax detection. I will not refer to any of the newer PCR-based technologies or "rapid assay" biosensors that are in development for on-site use. However, please remember that the performance of even these newly-emerging

analytical techniques rely upon the efficiency of same surface-sampling procedures at their "front end" to get the bacterial spores out the environment and into a form for analytical testing (1).

Recommendations:

I would like to begin with three recommendations to your committee. They can be summarized with the words: *leadership*, *support* and *peer-review*.

First is *leadership*. We would ask that *a single Federal agency assume the leadership role in guiding the evaluation, performance improvement and validation of standardized surface-testing systems* for anthrax detection in indoor environments. Our primary concern has been the lack of a unifying national doctrine that establishes the level of performance (sensitivity, reproducibility, accuracy, practicability) needed in surface-testing systems. This has led to the Federal agencies using environmental testing procedures and laboratory protocols that differ in their technical details. This has a direct impact on their interoperability. We need a single leading Federal agency to implement a unified, optimized and verifiable approach to environmental testing for the detection indoors of dispersed agents of bioterrorism.

Second is *support*. We feel that the surface-detection methods need optimization and validation. To improve these methods, *adequate Federal funding and resources need to be allocated* in response to "top down" requirements. We have prepared a research proposal to study these issues ourselves and have been amazed that there is no Federal program we can identify with a clear mission to support environmental surface-testing systems development. Extramural funding of research by academic and industrial laboratories is needed.

Third is *peer-review*. We need *open, scientific peer review* to allow the relevant expertise of academic and industrial specialists to assist capable government scientists in (a) evaluating existing methods (b) developing optimized consensus procedures and (c) validating these integrated testing systems. In the academic community, we are used to this open interchange of peer review. We feel it provides the best approach to minimizing turf battles among different groups while extracting the best ideas from each participant. While the interchange of ideas should be open, we also understand that some national security issues will have to be managed in this peer-review process.

The experiences of testing for anthrax at Wallingford, Brentwood and Capitol Hill have taught us that we need leadership, funding and resource allocation, and peer review to insure we have optimized, consensus-based environmental surface testing systems for future use.

The Importance of Surface-Testing Systems

More work is needed on *surface* detection methods, as distinguished from *air*-sampling methods. A recent methods-comparison study at the contaminated Brentwood Road

postal facility by Sanderson et al. (2) has clearly taught us that bacterial spores *settle into reservoir dust and do not remain airborne*. In fact, all air samples collected in this study were negative. It was the surface-sampling methods and not air sampling (3) that provided the useful environmental data for making decisions about both the presence and amount of contamination in the building. While the support of air sampling method development has been extensive, I have been unable to identify a defined Federal mission and funding support for surface sampling method development. This has resulted in a lack of preparedness because we do not have validated, sensitive, specific, quantitative and reproducible environmental surface detection methods for bacteria, viruses and toxins ready for use.

Improvements to Existing CDC and US Postal Service Environmental Testing Procedures:

The Centers for Disease Control and Prevention (CDC) and the U.S. Postal Service (USPS) have both issued interim guidelines with procedures for environmental sampling and analysis to detect anthrax in buildings (4-6). I would like to thank the authors of these documents for a tremendous effort in their preparation during a time of national crisis. We now have the opportunity to enhance these procedures by making a number of small but significant technical improvements. Moreover, the procedures need to be validated for field collection and laboratory analysis. We really do not know the sensitivity (minimum detectable dose), reproducibility (variation), and quantitative detection capabilities of the available environmental testing systems. These need to be documented with positive "challenge" testing using suitable "surrogates" and actual bioagents of concern.

Based on our review of relevant scientific literature, we believe that a number of details in the published CDC and USPS surface-testing procedures need re-examination. They involve both procedural differences between these two agencies' methods, and some features that they share in common. A more extensive list of these issues is provided as Appendix I to our written testimony. I would like to illustrate a few of the technical differences in the swab-based assay procedures that can lead to variable performance. The CDC and USPS swab-rinse assay procedures varied as to:

(a) *whether dry or wet swabs are used.* As far back as the introduction of the swab-rinse assay in 1917 (7), we could identify no justification for the use of *dry* swabs in swab-rinse environmental testing. Moreover, the inter-agency Brentwood study (2) lead us to consider the dry swab data unreliable.

(b) *whether or not any detergent was added to the sample rinse to aid spore extraction.* The USPS did not incorporate its use in their swab-rinse procedure.

(c) *the volume of rinse used to extract the swab*: (*CDC: 3 ml* vs. *USPS, 1.5 ml*).

(d) *the fraction of the total extract volume inoculated onto culture plates*: (*CDC: 1/10* vs. *USPS: 1/15*). We believe that both methods cultured too little of total extract volume for use as a "rule out" assay that should be maximally sensitive to support a "zero" tolerance policy (8).

(e) *how many culture plates were inoculated per sample* (*CDC: 3* vs. *USPS: 1*). The culturing of a single plate provides no measure of variation, and I do not consider this good laboratory practice.

I believe that these and other technical issues that both procedures share may have made all the difference between successful anthrax detection and failure. One shared characteristic among the CDC and USPS swab rinse methods that should be reviewed is the surface area that is covered per swab. A 100 cm^2 area is probably too big for a small swab. Sampling this area could lead to both incomplete area coverage and overloading of the swab with surface debris.

The cumulative effect of these variables on sampling may have led to the early negative results from surface testing at the Wallingford postal facility on November 11, 14 and 25, 2001 and subsequent positive results for anthrax on November 28. From published data at Brentwood, I can conclude that there may have been some "false negative" test results reported at Brentwood due to these technical issues associated with the sampling process.

Another variable that deserves more careful review is the practice of reporting vacuum sample test results in terms of "colony forming units per gram" (CFU/g) of collected dust. The utility of this unit is not intuitively obvious to me. Because the amount of surface dust often varies across a confined surface area, actual differences in the levels of anthrax spores per unit area or device may be masked. This is schematically shown in (Figure 1). A more useful method of reporting is surface "loading" which is reported as the quantity of spores per unit area (e.g. CFU/cm^2). From this, the total bacterial burden on a machine or instrument can be calculated. To do this, however, the area sampled needs to be accurately recorded as the CDC procedure specifies (6).

In terms of positive test outcomes, it appears that the wet-wipe and vacuum filter sock collection procedures appeared to work better at Brentwood and Wallingford than the dry or wet swabs. Even so, we feel there are a number of variables these procedures that need further review and possible optimization. For instance, scientists associated with the National Aeronautics and Space Administration (NASA) reported an alternative version of wipe-rinse assay procedure. They used a bonded-polyester 9 x 9-in. wipe cloth that was folded and wiped on surfaces in a defined manner (10,11). The CDC's recommended wipe-rinse assay differs from this NASA method because it uses a 3 in x 3 in. or smaller synthetic gauze pads. It also lumps wipes with different characteristics (gauze, sponges and Handi-wipes^R) together which has the effect of increasing inter-specimen variation. Validation of the CDC methods in relation to NASA's prior art might be prudent. There are also a number of improvements to the High Efficiency Particulate Air (HEPA) vacuum procedure reported by the CDC that are suggested by the literature. Because of our interest in the vacuum filter sock, we have planned research studies to optimize the HEPA vacuum-rinse surface testing system.

Conclusion:

In conclusion, we have the intellectual capability in the United States and an excellent existing framework of available surface-detection procedures as published by the CDC and USPS. What we need now is for a single agency to lead our scientific body, with sufficient financial and personnel support and peer-review discussion to modify the existing environmental surface testing systems so they are maximally sensitive, reproducible and quantitative.

Mr. Chairman, this concludes my formal remarks. I look forward to working with you on these important issues, and would be happy to take any questions from the Subcommittee.

References:

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2. Sanderson WT, Hein MJ, Taylor L, Curwin BD, Kinnes GM, Seitz TA, Popovic T, Holmes HT, Kellum ME, McAllister SK, Whaley DN, Tupin EA, Walker T, Freed JA, Small DS, Klusaritz B, Bridges JH (2002) Surface sampling methods for *Bacillus anthracis* spore contamination. Emerg. Infect. Dis. 8(10):1145-1151. Available at URL: <http://www.cdc.gov/ncidod/EID/vol8no10/02-0382.htm>.
3. An important exception is the use of so-called "aggressive sampling" techniques, such as have been recognized for use in testing decontaminated sites for residues of viable anthrax. In these methods, settled spores are mechanically resuspended from surfaces, and then air sampling is employed for detection. See Weis CP, Intrepido AJ, Miller AK, Cowin PG, Durno MA, Gebhardt JS, Bull R (2002) Secondary Aerosolization of Viable *Bacillus anthracis* Spores in a Contaminated US Senate Office. J Am Med Assoc 288(22):2853-2858, December 11, 2002. Available at URL: <http://jama.ama-assn.org/issues/v288n22/rfull/joc21393.html>. See also: National Response Team: Technical Assistance for Anthrax Response, Interim Final Draft, September 2002. Available at URL: <http://www.nrt.org/production/nrt/home.nsf/resources/publications/$file/final_anthrax_TAD_10_3_02.pdf>
4. CDC: Procedures for Collecting Surface Environmental Samples for Culturing *Bacillus anthracis*, November 13, 2001. URL (as accessed December 7, 2001): <http://www.bt.cdc.gov/DocumentsApp/Anthrax/11132001/final42.asp>
5. USPS: Interim guidelines for sampling, analysis, decontamination and disposal of anthrax for U.S. Postal Service facilities, December 4, 2001. Available from the American Postal Workers Union at URL: <http://www.apwu.org/departments/ir/s&h/anthrax/Protocol/120501_uspsissued_version.doc>

6. CDC: Comprehensive Procedures for Collecting Environmental Samples for Culturing *Bacillus anthracis*, April 25, 2002 (Revised). Available at URL: <http://www.bt.cdc.gov/Agent/Anthrax/environmental-sampling-apr2002.asp>

7. Manheimer WA, Ybanez T. Observations and experiments on dishwashing. Am. J. Public Health 7:614-618, 1917. In contrast to the established use of moistened swabs in the testing of environmental surfaces for microbial contamination, dry swabs are commonly used by physicians to collect moist clinical specimens from patients for what is termed the "swab-smear" assay.

8. Cf. "EPA used a standard for the remediation of 'negative result for anthrax.' The standard means that the tests taken after cleanup come back from the laboratory as negative for anthrax." See: Environmental Protection Administration (EPA): "Fact Sheet for the Hart Senate Office Building Cleanup" dated 20 Nov. 2001. URL: <http://www.epa.gov/epahome/headline2_112001.htm#24 >. See also questions answered following prepared statement of EPA Administrator Gov. Christine Todd Whitman at a U.S. Senate hearing on November 28, 2001; cf. URL: <http://www.epa.gov/ocir/hearings/testimony/112801ctw.PDF>. A streaming video archive of the full hearing has been made available by C-Span.org, at URL: <http://cspanrm.fplive.net:554/ramgen/cspan/mdrive/ter112801_epa.rm>

9. Government Accounting Office. U.S. Postal Service. Better guidance is needed to improve communication should anthrax contamination occur in the future. GAO-03-316. April 2003. Available at URL: <http://www.gao.gov/new.items/d03316.pdf>

10. Kirschner LE, Puleo JR. Wipe-rinse technique for quantifying microbial contamination on large surfaces. Appl. Environ. Microbiol. 38(3):466-470, 1979.

11. NASA (2000) Procedures and Guidelines NPG: 5340.1D (FINAL DRAFT). NASA Standard Procedure for the microbial examination of space hardware. January 2000. Available at URL: <http://centauri.larc.nasa.gov/discovery/FinalNPG_5340.1D.PDF>

Appendix I.

Our primary technical concerns about the details of CDC and USPS issued procedures for testing environmental surfaces in anthrax-incident response, are as follows:

1. Specification of "non-cotton" rather than cotton swabs (see #9) (CDC and USPS)

2. No detergent included in sampling-media (swab, wipe) wetting agent (CDC)

3. Dry swabs (no wetting agent) used for sampling surfaces (USPS)

4. Surface coverage area per sample is too large, or is ill-defined (CDC and USPS)

5. Ill-defined details of manual surface-contact and vacuuming techniques (CDC and USPS)

6. Swab and wipe specimens transported dry to the assay laboratory (CDC and USPS)

7. No detergent included in rinse liquid formulation (USPS)

8. Mechanical extraction by "vortexing" inadequate to "disintegrate" swab fibers and disperse spores (CDC and USPS)

9. Sonication techniques not employed for mechanical extraction (CDC and USPS)

10. Concentrating extracts by centrifugation and resuspension raises particulates-binding issues (CDC and USPS)

11. Excessive sample "splitting": using only a small fraction of the total extract volume to inoculate culture plates for each sample (USPS: 1/15, CDC: 1/10)

12. Non-replicate (single) rather than triplicate plating (USPS)

13. No provision of any "positive controls" to calibrate testing procedures, support proficiency training, enable quality assurance and thereby reduce risks of "false negative" outcomes of testing (CDC and USPS). Cf. "negative controls" which are provided for in the form of numerous sample "blanks" to monitor cross-contamination (CDC and USPS).

14. No well-preserved retention of extracted media ("spent" swabs, wipes or filters) for optional enrichment culture by broth immersion, for a "fail-safe" assurance of reliability in "rule out" testing (CDC and USPS)

Figure 1

Schematic: Variabilities in HEPA Vacuum-Rinse Assays for Anthrax, When Expressed in Units of Sample Spore Concentration (CFU/g)

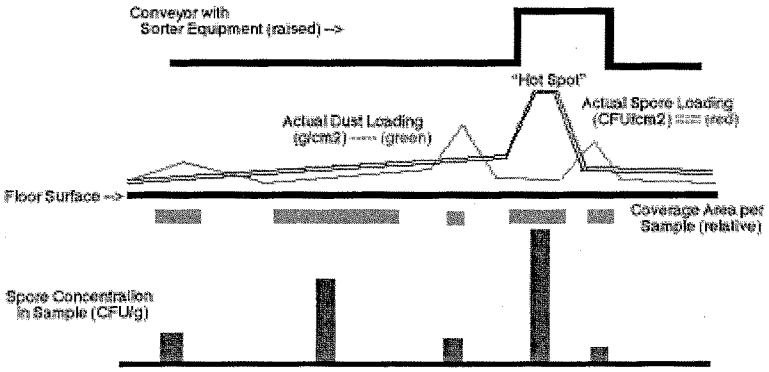

Figure 1: Schematic illustrating the possible ambiguity associated with the units (CFU/g versus CFU/m^2) used to report sample spore concentration derived from HEPA vacuum-rinse assay data. The top panel indicates a theoretical conveyor belt room in a mail distribution center in which the raised area indicates the sorter equipment location. If a letter with anthrax passes through the room, a hot spot of spores (double line) is created as illustrated in the middle graph (double line). The spore concentration values reported in the lower panel as CFU/g are computed as the ratios of total spores detected to the total weight of dust mass collected (*vertical bars).* The CFU/g levels can vary greatly because of large differences in sampling surface coverage areas (*horizontal gray bars*) and do not reflect actual spore loading (CFU/cm^2). This results from collections adapted to varying levels of surface dusts (*green curve*) in order to maintain consistency in total dust mass collected rather than being proportionate to any actual differences in *Bacillus anthracis* spore surface-loading levels (population density) at floor locations tested (*double-line red curve*). Graphic prepared by: Johns Hopkins DACI Reference Laboratory, Johns Hopkins University School of Medicine, Baltimore Md. 21224.

TABLE 1

Some Environmental Surface-Sampling Methods

Specimen Type	Agency	Material	Wetting agent	Area Sampled	Collection Pattern	Ref.
Dry Swab	USPS	Dacron or Rayon (non-cotton) sterile swab	None	100 cm^2 ("about the size of half a sheet of paper")	Horizontal S strokes, *rotate*, then vertical S strokes (*illustrated*)	5
Wet Swab	CDC	Non-cotton (e.g., Rayon) sterile swab	Sterile water, saline or PBS*	<100 cm^2 ("Avoid letting the swab dry completely")	"Enough vertical S strokes to cover area completely"	6
Wet Swab (for "surface "bioburden" of spacecraft hardware)	NASA	Autoclaved then dried sterile cotton	Sterile water (10 ml)	No more than 26 cm^2 (2 in x 2 in)	Rotational swabbing motions in three 90-degree changes of direction, then immerse in water	11
Wet Wipe	CDC	3 in x 3 in or smaller synthetic (non-cotton) gauze pad (gauze, Handi-Wipe^R, sterile sponge)	Sterile water, saline or PBS* (moisten)	Approximately 1 ft^2 (0.0929 m^2) ("Avoid letting the gauze pad dry completely.")	Vertical S strokes, *fold*, then horizontal S strokes	6
Wet Wipe (for "surface "bioburden" of spacecraft hardware)	NASA	Autoclaved then dried 100% polyester bonded clean room wipes, 26 cm x 26 cm (~10 in x 10 in)	Sterile distilled water (15 ml)	Unspecified; routinely up to 0.74 m^2 (8 ft^2), according to Kirschner and Puleo (1979)	Rotational rubbing motions in three 90-degree changes of direction w/folding	10, 11
HEPA Vacuum Dust Collection Filter ("Nozzle Sock")	CDC	HD polyethylene filter (1 μm nom. porosity) in high volume air (28 cfm) intake device	None	No area specified	One pass at 12"/sec; 1-2 tablespoons debris/dust needed/desired	6
Microvacuum (personal air sampler)	EPA	Gelatin filter (3 μm nom. porosity) in low volume air (4 cfm) intake device	None	100 cm^2 (defined by template)	Slow back-and-forth motion, first in one direction, than 90 degrees perpendicular	3

* PBS = phosphate buffered saline

Mr. SHAYS. Thank you Dr. Hamilton. Colonel.

Colonel HENCHAL. Mr. Chairman and distinguished committee members, I'm honored to appear before your committee to answer your questions regarding technologies and protocols for detecting anthrax and other biological agents. I'm Colonel Erik Henchal, the Commander of the U.S. Army Medical Research Institute of Infectious Diseases [USAMRIID].

USAMRIID has had a 34-year history of basic and applied research in the area of diagnosis, treatment and prevention of hazardous infectious diseases. Our efforts, especially over the past 8 years, have been instrumental in the development of reagents and the evaluation of medical diagnostic systems and procedures that are playing an active role in our Nation's defense and national security.

During the 2001 anthrax attacks, I led a team that processed over 30,000 environmental samples and performed approximately 260,000 assays supporting the Senate, the Capitol Police, the FBI, the CDC and other executive branch agencies. Dr. George Ludwig, who is USAMRIID's Chief, Diagnostics Systems Division and coordinates basic and applied research of medical diagnostics technologies, joins me today.

The tragic events following the terrorist use of the U.S. Postal Service during the fall of 2001 to deliver anthrax spores demonstrates that there's still much to be learned about the effects of this agent under conditions different from those encountered during natural outbreaks. In particular, the health effects of aerosolized anthrax spores on various populations are very poorly understood.

The death of a possibly immunocompromised 94-year-old woman in Oxford, CT, from inhalation anthrax after no known exposure suggests that some populations may be much more susceptible than others. The fact that relatively few cases of anthrax were observed among the large number of individuals potentially exposed to high concentrations of anthrax spores further complicates interpretation of the epidemiological data. Estimates for infectious or lethal doses of anthrax spores are based upon studies with laboratory animals, not humans and the values must be interpreted very carefully. The most common figures quoted for lethal aerosol doses of anthrax are between 8,000 and 50,000 spores. This range reflects the dose estimated to be capable of killing one-half of the animals exposed.

There are substantial scientific uncertainty regarding the dose-response relationship, and there's no scientific consensus that has been reached on the lethal infectious dose in humans. As a result, we're concerned that any level of contamination of anthrax could potentially lead to harm to some exposed individuals. While any amount of contamination should be a concern, the context of that contamination must be carefully considered, especially when attempting to determine a forensic link to a purposeful release and when attempting to formulate health policy. The detection of spores in dust collected from an urban U.S. Postal Service facility would be a greater concern than finding spores in soil collected in a rural area. These differences illustrate the need to make use of all available expertise when making policy decisions from basic test data.

At USAMRIID we err on the side of caution initially, but use all available resources to formulate a long-term response that is appropriate for the situation. This doctrine is routinely taught at USAMRIID to managers and technicians of field-deployed laboratory units.

The events that unfolded at the Wallingford, CT postal facility represent, to large part, a lack of knowledge and experience with the biological data. In reality, local government officials and the Postal Service could not have anticipated the requirement for this knowledge or experience prior to the events of September and October 2001.

Moreover, experience with anthrax spores is available at relatively few locations in the United States. The lack of experience and knowledge exacerbated the problems with the post-attack response. First, methods for collecting samples consistent with the physical and biological characteristics of the material were poorly understood. Misunderstandings led to delays in reporting and the implementation of work force protective measures. Second only a small number of laboratories were capable of reliably detecting and identifying bacillus anthracis. This resulted in the reliance upon procedures that were not adequately validated, producing disparate results with further delays in the implementation of protective measures. We are pleased that through an ongoing collaboration among the Department of Defense, the Environmental Protection Agency and the Centers for Disease Control and Prevention, validated methods and protocols will be developed later this year.

The most important lessons learned from these tragic events can be summarized in four basic points. First, in the absence of reasonable surety, always err on the side of caution.

Second, develop procedures for validation of test data that are based upon sound and experienced scientific judgment. However, the clinical data will be the hardest to obtain. We may never be able to definitively define the risk, especially in low-dose exposures as occurred in the Wallingford postal facility.

Third, we must make efficient and maximum use of all available expertise to help develop concepts of operation that will provide the greatest margin of safety for the public.

Finally, we must make every effort to ensure that this expertise, this national resource, both in government and in academia, is maintained and expanded by increasing opportunities for dedicated scientists and to develop technologies that have been responsible for preparing for this and future bioterrorism events.

I thank the subcommittee for its time and would be happy to entertain your questions.

[The prepared statement of Colonel Henchal follows:]

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STATEMENT TO THE COMMITTEE ON GOVERNMENT REFORM, SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING THREATS AND INTERNATIONAL RELATIONS

Christopher Shays, Connecticut
Chairman

Room B-372 Rayburn House Office Building
Washington, D.C. 20515
19 May 2003

Presented by COL Erik A. Henchal and Dr. George V. Ludwig, U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, MD 21702

Chairman and distinguished committee members, I am honored to appear before your committee to answer your questions regarding technologies and protocols for detecting anthrax and other biological agents. I am Colonel Erik Henchal, the Commander of the U.S. Army Medical Research Institute of Infectious Diseases, known as USAMRIID. USAMRIID has had a 34-year history of basic and applied research in the area of diagnosis, treatment and prevention of hazardous infectious diseases. Our efforts, especially over the past eight years, have been instrumental in the development of reagents and the evaluation of medical diagnostic systems and procedures that are playing an active role in our nation's defense and national security. During the 2001 anthrax attacks, I led a team that processed over 30,000 environmental samples and performed approximately 260,000 assays supporting the Senate, the Capitol Police, the FBI, the CDC, and other Executive Branch agencies. Dr. George Ludwig, who is USAMRIID's Chief, Diagnostics Systems Division and coordinates basic and applied research of medical diagnostics technologies for the Department of Defense, joins me today.

The tragic events following the terrorist use of the U.S. Postal System during the Fall of 2001 to deliver anthrax spores demonstrates that there is still much to be learned about the effects of this agent under conditions different from those encountered during natural outbreaks. In particular, the health effects of aerosolized anthrax spores on various populations are poorly understood. The death of a possibly immunocompromised 94 year-old women from Oxford, Connecticut from inhalation anthrax after no known exposure suggests that some populations may be much more susceptible than others. The fact that relatively few cases of anthrax were observed among the large number of individuals potentially exposed to high concentrations of anthrax spores further complicates interpretation of the epidemiological data. Estimates for infectious or lethal doses of aerosolized anthrax spores are based upon studies with laboratory animals, not humans, and the values must be interpreted carefully. The most common figures quoted for lethal aerosol doses of anthrax are between 8,000 and 50,000 spores. This range reflects the dose estimated to be capable of killing one-half of the animals exposed.. There is substantial scientific uncertainty regarding the dose-response relationship; no scientific consensus has been reached on the lethal infectious dose in humans. As a result, we are concerned that any level of contamination with anthrax could potentially lead to harm to some exposed individuals. While any amount of contamination should be a concern , the context of the contamination must be carefully considered, especially when attempting to determine a forensic link to a purposeful release and when attempting to formulate health policy. The detection of spores in dust collected from an urban U.S. Postal Service facility would be a greater concern than finding spores in soil collected from a rural area. These differences illustrate the need to make use of all available

expertise when making policy decisions from basic test data. At USAMRIID we err on the side of caution initially, but use all available resources to formulate a long-term response that is appropriate for the situation. This doctrine is routinely taught at USAMRIID to managers and technicians of field-deployed laboratory units.

The events that unfolded at the Wallingford, Connecticut postal facility represent, to a large part, a lack of knowledge and experience with the biological data. In reality, local government officials and the postal service could not have anticipated the requirement for this knowledge or experience prior to the events of September and October 2001. Moreover, experience with anthrax spores was available at relatively few locations in the U.S. The lack of experience and knowledge exacerbated the problems with the post-attack response. First, methods for collecting samples consistent with the physical and biological characteristics of the material were poorly understood. Misunderstandings led to delays in reporting and in the implementation of workforce protective measures. Secondly, only a small number of laboratories were capable of reliably detecting and identifying *Bacillus anthracis*. This resulted in the reliance upon procedures that were not adequately validated, producing disparate results and further delays in implementation of protective measures. We are pleased that through an ongoing collaboration among the Department of Defense, the Environmental Protection Agency, and the Centers for Disease Control and Prevention, validated methods and protocols will be developed later this year.

The most important lessons learned from these tragic events can be summarized in four basic points. First, in the absence of reasonable surety, always err on the side of caution.

Second, develop procedures for validation of test data that are based upon sound and experienced scientific judgment, although testing in humans will prevent obtaining such data. #2 is great, IF and only IF, you have the data or can generate it in a reasonable and cost-effective time frame - we still don't, nor will we ever have, exact data on the lethal dose for inhalation anthrax in humans upon which to establish baselines.

Third, make efficient and maximal use of available expertise to help develop concepts of operation that will provide the greatest margin of safety for the public. Finally, we must make every effort to ensure that this expertise, this national resource, is maintained and expanded by increasing opportunities for the dedicated scientists and technicians that have been responsible for preparing for this and future bioterrorism events.

I thank the subcommittee for its time, and we would be happy to entertain any questions.

Mr. SHAYS. Thank you very much.

We're going to start with Mr. Ruppersberger. We'll do 5 minutes, then we'll go to Mr. Janklow, then Ms. DeLauro and myself.

Mr. RUPPERSBERGER. First, we have to learn from our past experiences. I think, Dr. Hamilton, was it you talking about leadership, and I think what agency would be responsible. We are, as we relate after what happened on September 11 and the anthrax issue we're learning as we go. The good news for the United States of America, I believe, that our agencies are doing well, working together as a team, but we can continue to do better, and when we have a situation as we had in Connecticut, we need to learn from that.

I said when I started, in my opening statement, that I visited the facility that was manufacturing the really, I guess it's called a biodetection system, and it's being manufactured in conjunction with, I think, Northrup Grumman and Davis industries and really looked at it and saw it in use. Right now, that has been used in the Baltimore facility, and I understand the term is "zero test positive" is that correct scientific indication, and I would like to know your opinion about the biodetection system that has been in use in Baltimore, and so far it has worked well. Do you agree with that? Do you know anything about that equipment? Anyone?

Dr. HAMILTON. May I ask a question?

Mr. RUPPERSBERGER. Sure.

Dr. HAMILTON. Has it been validated using positive controls? I assume it has.

Mr. RUPPERSBERGER. Well, I'm asking you the question, and if you don't know, then maybe there's someone else on the panel who might.

Dr. HAMILTON. I have a concern.

Mr. RUPPERSBERGER. That's it. It has been in 14 different areas. You have to look at the, I think, weather conditions. You have to look at a lot of different issues, but so far, from what we have been told, that it has been working based on the test system. I don't know, and I understand it's going to be going out into 14 other areas if it's not there already. What we want to do here is just get it right, and we want to make sure that we can protect our employees and our customers in the Postal Service because of what has happened here, and if, in fact, this technology is working, I want to know if anyone here has knowledge of it. That's my really my question.

Colonel HENCHAL. Sir, I have small knowledge about it. Some of the core technology, actually, was derived from technology and gene amplification devices that were developed by the Department of Defense and then transferred to a commercial manufacturer. The devices are currently being evaluated mostly with surrogates for anthrax. It's not possible to test these devices with large amounts of anthrax spores, as you can imagine, and so they do test these devices with surrogates for anthrax. These are related organisms that don't cause disease.

The focus, if I'm not mistaken, of the technology that's being tested at Baltimore is primarily through high-volume collection of air which is then tested using a single gene amplification technology. There may be other components of the system that I'm not aware.

One of the problems, I think, in that is that I think to really define the risk and to be able to detect an attack, there may have to be some other technologies involved such as surface sampling or protocols for surface sampling as well. I'm not sure that relying completely upon high-volume air sampling is the only solution.

Mr. RUPPERSBERGER. Let me ask you this. In that air sampling, that's the technology that is in use there, what about any other bioagents, other than anthrax?

Colonel HENCHAL. That's an excellent point, in that when we start to look at technologies and protocols for detecting a terrorist attack, we have to validate against all of the most likely threats that we will face. The protocols that we validate for anthrax may not be appropriate for some other threats such as ricin toxin, and I don't believe that we've been able to do those studies yet.

Mr. RUPPERSBERGER. I would suggest anyone involved in this very important issue, and I'm sure that Homeland Security is being involved also, find out as much as they can about the equivalent that's being used in the Baltimore operation now, because my staff has contacted the U.S. Post Office, and from what we get from them that they feel very good about what's happened so far with that equipment. All we're trying to do is get whatever we need to deal with the issue, so that we can protect lives.

One other question, resources. Any indication of where we are with respect to resources to continue to research, to look at equipment, personnel? Do you have an opinion on resources or are they lacking now? And where you think we need to go? Anybody on the panel whatsoever.

Dr. RHODES. One of the resource issues is amongst the diagnostic laboratories. Initially, after the fall anthrax attack, one of the limitations on the ability of the Postal Service to get its samples reviewed was that the network of qualified diagnostic laboratories was limited. Obviously, if there's funding there, if either Homeland Security or whomever in the Federal Government is willing to put the funding into that to meet the risk associated with a bioterror event, then we won't have this bottleneck that occurred in September and October 2001. Because that was part of some of the discussion about what sampling methods were employed; what laboratory can handle what sampling method within a reasonable time period.

Mr. RUPPERSBERGER. Time's up, Mr. Chairman.

Mr. SHAYS. Thank you, Governor.

Mr. JANKLOW. Thank you, Mr. Chairman.

Colonel, most of my lifetime I've read news reports about research that our country, the old Soviet Union, Russia, have done on substances like anthrax. Did the Postal Service ever contact the Department of the Army, specifically yours, or any other organization with respect to the testing that they were doing or what kind of contractor they ought to hire or what kind of protocols they ought to have in their testing analysis? Obviously, they did not contact John Hopkins. Did they contact you folks?

Colonel HENCHAL. Through the fall when the attacks were occurring in 2001, our contact was mostly with law enforcement agencies. As I remember, shortly after the first of January, after January, we did begin to be contacted by Postal officials, and we had a few teleconferences, as well as visits, to discuss the problem but

mostly the context of the discussions involved trying to identify the technologies for future systems.

Mr. JANKLOW. But by that time, they had two or three tests of their own testing done.

Colonel HENCHAL. I don't recall anytime where we had a chance to review that time, review the data. I don't recall a time, to review the protocols they were using.

Mr. JANKLOW. Colonel, we talk about spores 8,000 or 10,000 or whatever we think it may take. A spoonful would be how many spores? What were we talking about in terms of size?

Colonel HENCHAL. Practically uncountable. We're really talking about, you know, a magnitude of spores in a tablespoon that would be beyond our ability——

Mr. JANKLOW. Even if we had a spoonful?

Colonel HENCHAL [continuing]. To quantitatively give you a description of that.

Mr. JANKLOW. So when we say 8,000 to 10,000, it's a big number, but it's a very small mass?

Colonel HENCHAL. That is exactly correct.

Mr. JANKLOW. In my State, I come from South Dakota, we have anthrax in livestock virtually every other year. As a matter of fact, we had a veterinarian that caught it last year, the cutaneous kind. It's not that unusual. It's rare, but it's not that unusual. Has the Army done research going back decades? Stories I have read most of my life, are they true?

Colonel HENCHAL. I'm not sure what stories you've read, but the Army——

Mr. JANKLOW. I have read that the Soviet Union and the Americans and some of the other Armed Forces of the world have, the Iraqis have done extensive amounts of research with respect to anthrax. And so what I'm getting at is, if we've done this research, do we have a reservoir of technology which we can go on the shelf and get? Information, now that it is out in the civilian population?

Colonel HENCHAL. Well, we agree. And at USAMRIID, we've had pretty much a 34-year history of evaluating scenes, primarily from the medicals aspects, not environmental aspects, but I agree that even during the attacks of 2001, there was insufficient exchange of information that would have possibly helped interpretation of the results.

Mr. JANKLOW. Is the information, as far as you know, that the Army has now, is it open and available to the civilian, the general law enforcement and medical and epidemiological civilian authorities?

Colonel HENCHAL. Generally, the protocols that we have and the testing methods that we have, actually, are available and more could be provided through opportunities for interagency exchange.

Mr. JANKLOW. What could—do you mean more could be provided than what are they asking you for and where it is?

Colonel HENCHAL. There is—for the most part, we're an open scientific literature laboratory, which means that we do have a lot of knowledge that we've already published in the scientific literature. But I think that there is because we have a body of scientists at USAMRIID that have a lot of institutional knowledge, and I think

through more peer review and scientific exchanges, if those could be encouraged, more information may be available.

Mr. JANKLOW. Dr. Rhodes, in the research you did in preparing for your testimony in the report that you wrote, did the Postal Service indicate what it would do? If it had it to do over again, what it could would do differently?

Dr. RHODES. Yes.

Mr. JANKLOW. Could you tell us what that is?

Dr. RHODES. What they would do differently is that they would use, I mean, we were told that they would use.

Mr. JANKLOW. They would not use the dry swab. What else?

Dr. RHODES. They would use the aggressive method.

Mr. JANKLOW. Who told them to use the dry swab? Who was the genius that came up with that one?

Dr. RHODES. Well, Mr. Janklow, they contracted for it.

Mr. JANKLOW. Obviously, the contractor was not much brighter than the contractee.

Dr. RHODES. The dry swab was a method that was being used at the time, and it was the method that they applied. The Centers for Disease Control did issue comment saying that they should add water to it; they should wet it with one to two drops of water on the swab. But as the Colonel has pointed out, and as Dr. Hamilton has pointed out, this was an evolving process. It was necessary for people to learn as they went. What we learned was people were trying to interpret and apply existing methods and procedures that were not applicable, directly, to the environmental capture of bacillus anthracis. In some cases they were employing mold spore methods.

Mr. JANKLOW. Thank you.

Mr. SHAYS. Thank you. Ms. DeLauro.

Ms. DELAURO. Thank you very much.

If I could just followup on my colleague's comment. With the acceptable technology, dry swabs, wet swabs, wet wipes, HEPA vacuum, amongst those, is one better than the other? Is one more efficient than the other? Are two more efficient than the other? And if that's the case, if there's a differential, and we know that there's one that's better than the other, why aren't we using the best, and help me if that's——

Dr. RHODES. Well, I think that why aren't we using the best, I think now, the best would be applied.

Ms. DELAURO. What would that be?

Dr. RHODES. It would be a combination, as was seen when the Centers for Disease Control went into the Wallingford facility and used wet wipes, as well as the HEPA vacuums, in combination, they found 3 million spores on machine No. 10.

Ms. DELAURO. My point is, did we know that wet is better than dry before we started the process in Wallingford? So that body of knowledge or that information that—and I don't know who the contractor was either, but the fact is, if within the literature of this effort, there is one process better than another? And then, why don't we just jettison what we don't believe works and move to what we want? What we know works?

Colonel HENCHAL. Ma'am, if I may. The wet swab method, actually, was derived from some methods that had evolved at

USAMRIID, especially when we were working with animals. But with regard to your specific question——

Ms. DELAURO. Is that the best one?

Colonel HENCHAL. Well, with regard to your specific question, you actually needed an integrated approach. There are many different variables when you start trying to sample an environment. You may need HEPA filter vacuums for chairs or for rugs, but you know, wet swabs are more appropriate for some kinds of surfaces. And so you have to have, really, an integration of different methods as you approach that problem.

Ms. DELAURO. I want to get to another question, but my point is, usually in these situations, and it was a brand new situation understandably, but the fact is, you don't have much time, you have to move quickly, it would seem to me if we do have information, if we do have processes and procedures, and we know which are the ones the best to go to, then let us move in that direction.

Let me followup. My time is going to be up in a few seconds here, and I don't want to beg the indulgence of the Chairman.

Colonel Henchal, what constitutes being exposed to anthrax, and can you walk through a room where spores have been found and expose a person enough to become sick? Given that we had 3 million spores identified here, how many spores need to be present to affect a person? In your judgment, how much of a risk did the Postal Service take by not informing workers, or even visitors to the facility, of the results of the anthrax tests? And in the report they talk about trace amounts, which is what was described to the workers. With the 3 million, with what we know about the situation, was this a "trace amount?"

Colonel HENCHAL. First, let me say that the question of exposure is a difficult one, as you can already imagine. In order to be exposed, not only does the organism have to be there, it has to be there in a form in which you can take it into your body or it can be absorbed on to the skin. In order to be an inhalation hazard, it has to actually be on a particle of a particular size. It has to be a very small, what we call 5 microns in size or less.

In order to be exposed and then get an infection through the skin, you have to have a way for the spore to land on your skin and be there and then enter a break in the skin.

And so whether or not any particular individual is at risk, depends upon a number of different variables. It may also depend upon the health status of that individual. Whether or not exposure to one anthrax spore is sufficient depends upon whether or not that spore has an opportunity to enter your body and then initiate that infection. Unfortunately, we don't why some people get sick and others do not.

Ms. DELAURO. But the 3 million—I visited that facility on December 11, 2001, and where we had made the discovery there. The workers, as I understand it, at that juncture were told there were trace amounts, and I was not particularly concerned about myself, but I was there. Was I or anyone else who was at that large gathering, including staff people, etc., exposed to Anthrax?

Colonel HENCHAL. You were probably exposed, but the risk of the infection may have been small, and the reason for that is the spores if they attach to paper waste, they have a particle size that

is too large for you to take into your lung and for the infection to initiate. It is possible, but under those conditions, the risk is small. If the anthrax spores are fixed onto the surface of the machine, on the metal of the machine, you probably have a low risk of infection, unless there is some way to transfer those spores to your skin.

Ms. DELAURO. Those workers, day in and day out, were exposed, and they have much more to do with the machinery than I did, and I will just say, would it have been prudent, as we did when we found difficulties, to shut down this plant, explain to the workers what their exposure or risk was, do what we needed to do to clean it up, and have them go back afterward?

Colonel HENCHAL. I would agree that the workers were exposed, but I can't make a decision or a recommendation about whether or not the plant should have been closed.

Mr. SHAYS. Great questions.

I am going to take my 5 minutes, and next round we will do 10 minutes, so we have a little more in-depth questioning.

For some reason I have been dreading this hearing. My previous committee had so many hearings on anthrax before September 11, and we had all these preconceptions. We had a preconception that once you had the symptoms—once they appeared, you were dead. You know, a few days later, you were going to die, and we had a preconception that it took a lot of the spores to kill you. Since then, we know we can treat it with antibiotics very aggressively and potentially with a vaccine even after that and that it probably doesn't take a lot of the spores to kill you. But we don't know which spores or, you know, which kind, under what conditions and about your health and so on.

I want to ask you, Dr. Rhodes, first, what are the most significant concerns that led you to make the recommendations included in your testimony?

Dr. RHODES. I guess the primary concern that I have is the uncertainty of infection. As you stated in your statement, in effect, zero is not zero, and one is equal to a million if you are the wrong person, at the wrong place, at the wrong time.

If you look at the fall of 2001 and you compare it to the accident in Sverdlovsk, in the former Soviet Union, where the bioproduction, the anthrax production center there had a somewhat equivalent release of anthrax into the community, you can see that the official numbers from the former Soviet Union are that between 60 and 70 people died. The unofficial estimates from outside sources are between 300 and 400 people died. We aren't talking about anthrax out of that facility that is less potent than what was sent through the mail.

If you look at the 94-year-old Connecticut woman with a suppressed immune system succumbing to an unmeasurable amount of anthrax, that is the concern that we have, that when we are talking about the general population, both in terms of the postal workers, as well as the general public, you are not talking about animal extrapolation, you are not talking about healthy males between the ages of 18 and 26. You are not talking about people who have biodefense gear with them. That's the main concern, the uncertainty.

Mr. SHAYS. It is also true, isn't it, that you had no conviction that other postal facilities are free from anthrax, in other words, they could have been decontaminated?

Dr. RHODES. That's why we make the recommendation structure as we say it, for those facilities deemed free of anthrax based on a single sample done with dry swab; that's the least effective method.

Mr. SHAYS. Therefore, we can make no assumption that they aren't contaminated, and we have to assume in one sense that they may be. Therefore, tests and the testing has to be extraordinarily aggressive, correct?

Dr. RHODES. That's our recommendation, to reassess the risk and whether the facility should be retested.

Mr. SHAYS. Dr. Hamilton, do you think other facilities could be contaminated?

Dr. HAMILTON. I would support what was just said in the sense that the methods that were reportedly used are not definitive and not really validated, and therefore, we really can't know with a confidence level that, in fact, those facilities are clean or negative.

In other words, it could be false negative results, which we now believe did occur, and so this recommendation, I think, is a very, very excellent one. How one goes about doing it——

Mr. SHAYS. Tell me this. Given your expertise, how did you react after September 11? What surprised you the most about this whole effort with anthrax, the exposure and the attempt to detect it and to treat it?

Dr. HAMILTON. The most concerning thing to me was the use of so many different protocols by different groups within the Federal Government that weren't communicating with each other. And the fact that, in the case of the U.S. Postal Service, they may have adopted a procedure that might have been suboptimal in terms of pulling spores off of a surface. And so the communication issue has been dealt with effectively by the GAO report, but the end result was that we needed to develop a consensus guideline for an optimized surface collection and testing strategy. And that's what surprised me the most of all the things.

Mr. SHAYS. I look for what I hope—I can appreciate the bottom line in the hearing, but that strikes me that may be the core message here.

But before giving my colleague his 10 minutes for a second round, should I be surprised that there wasn't a protocol? I mean, it seems kind of basic. With all the hearings we have had with scientists over the course of the last 8 years, this seems to me like what you would do in grammar school. In other words, this would be kind of basic stuff.

Dr. HAMILTON. In laboratory science, in running a clinical laboratory, we have other controls, we have validation of our procedures essentially well-established. So this should be a no question, a no brainer. And the fact that there was lack of—you have to appreciate that it was done in haste and there was an urgency, so I appreciate that fact. But it's been now quite a few months after the fact, and we're still in the same spot, and that's what concerns me is that we need an agency to pull this together. We need to get some support for that agency, and then we need to validate these

procedures. And those are my three recommendations and I still believe that they are supported by this one recommendation.

Mr. SHAYS. When government employees were being tested in the Capitol, this was after the exposures in Leahy's office and Daschle's office, contamination. My employees were being sent to the Hart Building to be tested, and so were everyone else's.

Mr. Ruppersberger.

Mr. RUPPERSBERGER. Thank you. When the hearing is over, we would hope we can accomplish something and can make some recommendations. And right now, we're hearing that there needs to be one agency that is going to have to pull all this together. Do you have any recommendations on what agency that would be or—let me ask that question.

Mr. Ungar.

Mr. UNGAR. Yes, sir. It would seem with the recent creation of the Department of Homeland Security that would probably be the appropriate location because we have so many different Federal agencies that are involved: the Postal Service, EPA, OSHA, Department of Health and Human Services, plus leading coordination with State and local health departments and others.

Mr. RUPPERSBERGER. Anyone else have a comment on that? Yes.

Mr. SHAYS. For the record, so it shows up, maybe we can get a vocal response.

Dr. RHODES. I concur with my colleague's opinion.

Dr. HAMILTON. I also concur, very much so.

Colonel HENCHAL. I concur also.

Mr. RUPPERSBERGER. Let me go through the line again. The resources that you think would be needed, as it relates to this issue, so that agency could probably pull it together and buy the necessary equipment to be able to determine that procedures are validated, and we can protect our employees and customers.

Mr. UNGAR. I don't know if it's a question of additional resources, right now. I think the first is leadership and initiative to call the parties together. And I don't think it's a question of there being no action right now, because there are a series of activities going on now to pull together the Federal Government's approach to dealing with these kinds of emergencies. The question is, what is the pace that's being carried out with right now, and once a real game plan is developed, then the question is, what additional resources would be necessary? And that kind of information, GAO doesn't have, at least in GAO at this point.

Mr. RUPPERSBERGER. I probably would agree with you with Homeland Defense, except for one thing. In my opinion, right now, Homeland Defense has not, again, been given the resources it needs to do what it needs.

Now, we have finished with our war with Iraq, and we have a lot more to do there, but hopefully, we can bring in other countries to help us pay for what needs to be done. We can refocus on first responders. But if you are going to ask for money, you have to justify it.

I am not going to get off that BDS system because what I have seen and what I think the postal officials will say that system seems to be working well, and they feel very secure that it is not giving false positives. I think it is important if that testing has

been done, that the entire community come together and at least look at it, because I would like someone else's opinion with respect to that piece of equipment.

Dr. HAMILTON. The surface samples were those samples that gave us the real information. So if that device is designed to run air sampling, a word of caution to the wise.

Mr. RUPPERSBERGER. And Colonel you brought up that issue.

Colonel HENCHAL. We need more scientific peer review. I agree with the leadership issue is the most critical one. We really need to be able to compare agency by agency about what technologies are really available and then be able to make really thoughtful recommendations to the Congress and others on what should be the next——

Mr. RUPPERSBERGER. I have a suggestion, and I would like your comments on it. I remember or I think we will always have serious issues as relates to drugs, drug interdiction and drug law enforcement areas. And one of the more successful programs was when all law enforcement came together in a strike force type of situation.

And why I think that worked, I mean you had the FBI got jurisdiction, you had DEA, State police and local governments. But in a strike force situation, you had a group of people targeting on one issue. They developed relationships and trust. And it seems to me that somehow we need something like that rather quickly because as far as I am concerned, time is a wasting. You have employees right now that I am sure that don't feel very secure as it relates to their health. That is not a very good working condition. And I think it's very important, and I am sure this is why we are having this hearing today that we are focusing on the best way to get it started.

When I walk out of here and the No. 1 issue you're talking about is leadership, where does this go? No. 2, and how do you deal with the issue of early detection and rapid response.

What do you think you could do as it relates to the employees as far as communication is concerned, looking at how we handled it in the past? And what we can do now, as it relates to communication to the employees who are there everyday and feel insecure based on some of the testimony today?

Mr. UNGAR. The first thing we had recommended, and I think everybody, Postal Service, EPA and all the Federal groups that commented is that there needs to be a good Federal guideline on communication. The agencies need to be brought together by good leadership to reach an agreement on what kind of information ought to be provided to employees. In a nutshell, in the Wallingford situation, it is very clear that the information was not sufficient on the quantitative results. As a matter of fact, even the qualitative results were not provided to employees quickly enough.

For example, the test results with respect to 3 million spores were available to CDC and to the Connecticut Department of Public Health on December 6. Prior to that time, the trace amounts had been identified, but the employees were not informed about even the term concentration until December 12. So there's a 6-day delay between the time that the public health authorities knew about the contamination being so extensive and the time that the employees were informed about the extensiveness of it. There is

definitely a need to get more prompt and complete communication to the employees.

Mr. RUPPERSBERGER. One thing I would suggest is you have a system set up that could be a manual set up. I mean a lot of jurisdictions throughout the country are doing that in the event there is any type of terrorist situation. One of the things I think would make the employees feel more secure is to have an employee as a part of that group that is going to help analyze and disseminate information. Getting back to the BDS system, and not because they are being manufactured in my jurisdiction, but let me ask you this question, based on what you're saying, in the different technology or testing mechanisms that are out there, would that system, depending on what your analysis of it is, be a part of the systems that should be used in conjunction with other systems to make sure that we're on top of it? In other words, if that system is what you think it is right now and would that be a part of something we should have in our portfolio, so to speak, to be able to deal with that situation as far as anthrax is concerned or any other agent such as anthrax?

Colonel HENCHAL. I agree it could be part of a total system. It has to be integrated with many different approaches for how you look at it and evaluate the contamination of instruments and surfaces and everything. What's more important is for us to have a scientific peer review of the performance to date and make sure that we have good consensus on that performance.

Mr. RUPPERSBERGER. Thank you. Mr. Ungar.

Mr. UNGAR. I would just like to add a couple of things. GAO did look at the Biodetection System early on and had a number of recommendations that we made to the Postal Service about making sure that the appropriate testing was done, and I believe the Postal Service did agree with that and did make some changes to its testing of that equipment.

We also planned, as far as I know, to look at that again here soon. And the third point is, we agree with you that the Biodetection System needs to be a part of a much larger assessment in the Postal Service about how to deal with this issue of mail security. There are many different things that are coming into play here. And for example, the whole process that the Postal Service uses to process mail. We held a conference back in December 2001 at the request of the members of the full committee in which a number of ideas were thrown out in terms of looking at the different ways anonymous mail is processed versus mail from known mailers and other aspects of the Postal System in terms of being able to identify who the mailers are and being able to handle mail in a manner in which, if it is contaminated, it doesn't contaminate the whole facility once it gets inside the facility.

Dr. HAMILTON. With regard to the funding—Johns Hopkins—in fact, I live in your district. One issue with regard to support for academic and industrial researchers would be to NIH, which is funded to study infectious disease and expand their scope so they can include that as one of their areas of investigation. They have closed out this whole area of environmental testing and focused on the medical issues relating to anthrax. It would be an immediate,

easy approach to get this extra funding for external investigators in academic and industrial facilities.

Mr. RUPPERSBERGER. That is a very good suggestion, but again, we are going to have to refocus our priorities. That's one of the major issues right now. Thank you.

Mr. SHAYS. Governor.

Mr. JANKLOW. Thank you, Mr. Chairman. I guess I have to ask you Mr. Rhodes, on November 11, they conducted tests at the facility. November 21, they conduct a test. November 25, they conduct a test. And it wasn't until the 28 test that they found the 3 million spores. Do we know or don't we know whether or not the anthrax came into that facility before or after November 25?

Dr. RHODES. Could you repeat your question again?

Mr. JANKLOW. Do we know whether or not anthrax was present in the facility on November 11, November 21 and November 25, when the dry swabs tested negative? I am not arguing the efficacy of dry versus wet or some other kind of testing, as much as I am asking the question, do we or don't we know at what point in time the anthrax spores came into the facility at Wallingford?

Dr. RHODES. We have an idea of when it came in. I mean we don't know exactly——

Mr. JANKLOW. Based on what?

Dr. RHODES. Based on a reverse trace of the mail that went to Ms. Lundgren's home. You can read the bar code on the mail, and you find out exactly what machine handled it, and what date it passed through.

Mr. JANKLOW. Was this the 94-year-old lady——

Dr. RHODES. Yes.

Mr. JANKLOW. Was there anthrax in that letter in her house?

Dr. RHODES. Well, there wasn't any anthrax found. She did die of inhalation anthrax.

Mr. JANKLOW. This is important because we may be drawing bad conclusions. Do we know or don't we know that the anthrax she got came through the Postal Service?

Dr. RHODES. Well the assumption——

Mr. JANKLOW. No. Do we know? We don't, do we?

Dr. RHODES. Do we know? There was another case of anthrax—bacillus anthracis spores were found along the mail route. We also know——

Mr. JANKLOW. I probably didn't ask my question very clearly. Did we find any anthrax, at all, in this lady's House, the 94-year-old's House?

Dr. RHODES. No.

Mr. JANKLOW. Did we find any on her letter?

Dr. RHODES. No.

Mr. JANKLOW. So we don't know how she was exposed to anthrax? We can assume it, but we don't know how she was exposed, do we?

Dr. RHODES. That is true. We do not know exactly how she was exposed. We don't have the concrete evidence.

Mr. JANKLOW. Sir, you keep saying that, like somehow that it was the Postal Service. We are concluding that without evidence? What we have at best is slight circumstantial evidence. The post-

man that delivered the mail to her house, was his pouch tested? I assume it was.

Mr. JANKLOW. Do you know whether or not they found anthrax in that?

Dr. RHODES. If I recall right, they did find anthrax in the vehicle and in the mail carrier's bag, I think.

Mr. JANKLOW. Did they find——

Dr. RHODES. I am trying to recall those details.

Mr. JANKLOW. Did they find any anthrax in any houses along that route?

Dr. RHODES. There was one other house they found anthrax in the mail.

Mr. JANKLOW. And that one that was—did the person get anthrax?

Dr. RHODES. No. Did not get sick.

Mr. JANKLOW. The protocols that we are talking about, do we have a set now? It's 2 years later. It's a year-and-a-half later. Do we have—Dr. Hamilton, do we have protocols in place or Colonel, now are we uniform in terms of the testing process or modality that is going to be followed.

Dr. HAMILTON. Yes and no. We have protocols in place that have been established by several groups. They're published. Are they optimized or validated? In my opinion, the answer is no. Can they be improved rapidly and readily, and the answer is yes. And we have written 12 suggestions in our testimony of actions that could be done immediately that would essentially bring some of the methodologies up to a reasonable level.

Mr. JANKLOW. Colonel, I am digging up an old memory, but wasn't there something 25 years ago where there was some sheep in Utah or Idaho——

Colonel HENCHAL. Nerve gas.

Mr. JANKLOW. Have, we as far as you know, contacted the Russians for their help in determining how much anthrax it may take to kill people and testing process, etc?

Colonel HENCHAL. I'm not aware of—it's been sometimes very difficult to find the information in the former Soviet program, as you know. There hasn't been always complete openness.

Mr. JANKLOW. I understand. Have we tried?

Colonel HENCHAL. We have certainly tried, and we continue to work through a program called the Cooperative Threat Reduction Program, but being able to get the right dialog has always been a challenge.

Mr. JANKLOW. The program we have with the United States assist in getting rid of former weapons of the Soviet Union, is that just a nuclear program, the one we spent $7 billion on, do you know or does that involve other weapons of mass destruction?

Colonel HENCHAL. I can't comment on that.

Mr. JANKLOW. When I look at the materials, it indicates that the Postal Service—just the Postal Service, alone, in this country, there's 85 districts, there's 385 distribution and processing centers and 38,000 post offices, stations and branches. Now, if we assume that the Federal authorities in terms of what they said publicly is that this was not a—in—I can say it this way, a foreign act of terror, and they feel it is a lone person that did it, let's assume for

a moment that it's an organized group bent on wreaking havoc on the United States that mails letters from 2 or 300 different areas where they have distribution centers, do we have a system in place at all to cope with that?

Mr. UNGAR. Unfortunately, sir, I'm not sure we do at this point. I think when the Postal Service is up next, you can ask it, but I would be surprised if there is a system that could cope with several hundred letters of the nature that were sent through Trenton and Brentwood and eventually ended up through cross-contamination, because if you are sending several hundred letters—and of course, there is no biodetection equipment now, other than the test locations. So, if you take several hundred letters themselves and going through these processing machines where they would conceptually cross-contaminate a lot of other mail, a lot of mail that would be going to different parts of the country, would be enormous, and it would require a huge effort to deal with.

Mr. JANKLOW. If I were to conclude that the protections we have for our people, for the workers and the people, for the Americans at this point is probably illusory——

Mr. UNGAR. Hopefully, the positive side of this, sir, is that we learned a lot of lessons since the last fall of 2001, and we would be much better prepared to deal with it, but I don't think we would be in a position to stop and detect it before it got into the postal system. It would probably get through the postal system and into the public before it would be detected, but, hopefully, we would be able to better deal with it after it happened at this point in time.

Mr. JANKLOW. Dealing with it in terms of everybody running out and getting Cipro again?

Mr. UNGAR. I would hope that there would be great cooperation and coordination between all the organizations now that we have the Homeland Security in operation now.

Mr. JANKLOW. We do, sir but given the monumental task they got in trying to bring all these disparate agencies together and work through all of the accommodations—this is like trying to get the U.N. to work together or 20 years ago the Army, Navy, Air Force and Marine Corps, which has gotten a lot better. But the Homeland Security Department has just come together. And I think maybe we are throwing too much of an assumption all of a sudden in terms of what they are capable of getting done in weeks and months. Would you disagree with that?

Mr. UNGAR. It would be tough, but at least it's there now and the role is there. Clearly before one of the dilemmas was that there was no clear notion of who was in charge. As Dr. Hamilton was saying, you have a large number of agencies at the Federal level, State and local organizations, public health, criminal investigation units, and so on. At least now, it's clear that Homeland Security is responsible.

Mr. JANKLOW. Dr. Hamilton, do you know whether or not people in the—academic people like yourself, academia, the researchers, the investigators have been engaged yet in terms of anthrax and other viruses, toxins and bacteria? Have they been engaged in putting together the testing modalities, testing and procedures and the analytical aspects and the best protocols to follow and those types of things?

Dr. HAMILTON. I don't believe the academic community has been mobilized because there has been no clear mission statement, unifying mission statement made to the academic community. When we go to NIH to get our grants funded, they have no absolutely mission in this area whatsoever. And NIAID, which should be supporting this, in fact, doesn't.

While they have the capability and they have been studying the medical aspects of these diseases extensively, the actual designs of methods—there are those rogue places, like our group, where we have taken the interest and actually focused on this issue with our own means. But the answer is, in general, no. We have the capability of supporting the governmental facilities and agencies which we are going to hear from shortly, but they have not been mobilized yet.

Mr. SHAYS. I want to acknowledge the presence of Ms. Sanchez and the ranking member, Mr. Kucinich. Both have requested Ms. DeLauro go next. I will be asking, Dr. Hamilton, for you to illustrate our detection capability. I believe you have a sample. I will do that after Ms. DeLauro is done.

Ms. DELAURO. Thank you very much, Mr. Chairman, and I want to thank my colleagues as well.

In the GAO report that came out in April 2003, I know that there was real concurrence on the notion of a single agency housed with Homeland Security. I believe, as well, that we're probably overwhelming this agency. But nevertheless, that was not the kind of recommendation that was made within the GAO report. And, in addition to which, in a further conversation with Dr. Hamilton that the coordination of these kinds of efforts along with the academic community was not listed as a recommendation, as well, to incorporate the body of knowledge that the academic community has here. The notion has been, why didn't you make the recommendation on a single agency, Department of Homeland Security, academic community in your efforts here?

Mr. UNGAR. Good question. We have a reason and the reason we didn't is that because that effort in Wallingford was the first step in a, first in a series we are going to be doing in this area. And testing, we are currently doing work at several different postal facilities that were affected by anthrax to see—actually compare them to Wallingford and look at the roles and responsibilities in a little broader context than we did at just one facility. We certainly wouldn't disagree with Dr. Hamilton, and I don't want to be too much of an optimist. One of the agencies that was not involved, of course, it wasn't created at the time this was going on was Homeland Security. We did send a draft of our report to the Department, but unfortunately it didn't respond to our draft or didn't comment on it, including the recommendations. So we were somewhat disappointed there.

Ms. DELAURO. How many agencies are now involved?

Mr. UNGAR. There are several. The ones that were most heavily involved were the Department of Health and Human Services and several components, including Centers for Disease Control and Prevention, but there were some others. The Department of Labor with OSHA, the Environmental Protection Agency, and the Army Corps of Engineers helped with the cleanup. Of course, the Postal

Service was involved, and then there were State and local health departments. The FBI was involved, and we could go on.

Ms. DELAURO. If I understand you, you are going to make a further recommendation about consolidating these efforts and housing this particular function of those agencies in one place, either with the Homeland Security or in another single agency to do this?

Mr. UNGAR. I am not sure how we will come out in the report. We are addressing that issue directly, and it sounds like a logical direction to take.

Ms. DELAURO. Further to Dr. Rhodes and Mr. Ungar, the GAO's report found that the Postal Service decision not to release the test results was understandable for a number of reasons, one of which was the advice it received from public health officials during its testimony. Dr. Rhodes, you said public health must focus on prevention. In order to focus on prevention, it seems to me that people need to be fully informed of the risks that they take.

Can you tell us exactly what advice the U.S. Postal Service received from public health officials that led them to withhold that information?

Mr. UNGAR. I am glad you stated that question—this was a very difficult and challenging situation at the time all this was happening. It was a crisis situation, and there were many different agencies involved that we indicated there, involved in the Wallingford case, as you know, with the FBI doing a criminal investigation in public health. We had a difficult time trying to ferret out exactly what happened back in 2001 when this was taking place. We talked to all the relevant parties and got somewhat conflicting information we couldn't resolve. Dr. Hadler who you will hear from shortly basically told us that he discussed this at length with the Postal Service and identified a number of optional ways in which the Postal Service could communicate the situation to the employees.

On the other hand, the Connecticut postal officials who we spoke to said that they really perceived that he directly recommended use of the terms trace and concentration. So we had a little bit of a disconnect there that we were unable to resolve. One reason was that, obviously, recollections are probably fading now because it happened so long ago. And the other issue was, there was no documentation kept. So we were told identifying or documenting what individuals said or advised or what people heard at the time and that's one of the recommendations that we did make.

Ms. DELAURO. In terms of your current recommendations, what is the process for oversight of those recommendations now, and how is that going to proceed?

Mr. UNGAR. The ones in our report?

Ms. DELAURO. The ones in your report. You told me you are going to do some other work in terms of the single-agency concept, but in terms of the procedures you have here.

Mr. UNGAR. In terms of the recommendations in our report, they are basically—the next step is for each of the agencies to which we made a recommendation, within 60 days of the date the report was released, to write a letter to this committee the Senate Committee on Governmental Affairs and the Appropriations Committees, detailing the actions that they've taken, and plan to take, and, of

course, we will followup with those agencies to assure or at least to report on what they have done.

Ms. DELAURO. Dr. Hamilton, how can and should tests be validated? Or everytime this comes up, we are going to say we can't validate the tests, therefore——

Dr. HAMILTON. Well, in the clinical lab, we use positive controls to validate the test. And by validate I mean looking at the performance characteristics, the minimum detectible concentration, the reproducibility, the quantitative features of it.

Ms. DELAURO. Why couldn't we validate those tests or at the least the basis on which we said in the report that we couldn't validate, therefore, we couldn't get accurate information to people.

Dr. HAMILTON. Well, I think we can validate them. We didn't validate them at the time this event happened. It happened—in hindsight clearly——

Ms. DELAURO. So we could have, but didn't?

Colonel HENCHAL. Ma'am, if I could. There were few laboratories where live anthrax could be used at that time, and there were actually very few people that had enough familiarity with the agent to do the validations. You might remember the two major centers for working for anthrax and many other biological warfare agents, are places like USAMRIID and the CDC in Atlanta.

Ms. DELAURO. You can do that in your facility, Dr. Hamilton? Is to validate ——

Dr. HAMILTON. What we are doing is working with Edgewood Arsenal right up the road from us. We can use surrogates in our laboratory, but the final testing will be done at Edgewood and or Dugway, the two facilities that can do that well, and we will hear of that from NIOSH.

Ms. DELAURO. Was the term "trace amounts" the information that was passed on to the workers in the facility? Dr. Hamilton, Colonel Henchal, was that misleading as to their risk and their potential health, in your professional view?

Dr. HAMILTON. In my opinion, it is a confusing term that's undefined. And terminology is one of the statements or one of the recommendations of the GAO report, to clarify the terminology. So I would say, yes, it's confusing.

Ms. DELAURO. And misleading?

Dr. HAMILTON. And misleading.

Colonel HENCHAL. I agree it's a confusing term. Whether it was done intentionally, I can't comment on that. One problem——

Mr. SHAYS. Will the gentleman suspend? No one is suggesting it's intentional.

Colonel HENCHAL. I apologize for the remark, but it's difficult to interpret that result, and I think that's what they were faced with.

Dr. HAMILTON. This brings up the issue of units. And one of our recommendations in our testimony was to use colony forming units per area instead of colony forming units per mass. And per mass unit comes from our work with—our allergy community work, where we measure mold spores in colony forming units per gram, and we can do that effectively because we have standards and we have controls. But in this case—we want to define the total burden of the contamination.

And so the units were one of the issues, I think, that was also brought up in the GAO report.

Ms. DELAURO. The final question I asked Colonel Henchal the last time and I do want to ask the rest of you, given what we know now, and it's hindsight, and I make no apologies for saying it with hindsight, do we believe that given the potential risk to these workers everyday, and they work every single day, and that plant was never closed down, should we have been prudent, should we have closed the plant down and did what we had to do? We closed Federal Government buildings down to protect Members of Congress—I'll let you answer the question. Should we have closed this facility down while we were checking it?

Mr. UNGAR. I don't know that I am in a position to answer that question. All I can say is, based on the information we were provided, which was provided by the Centers of Disease Control and Prevention and the Connecticut Department of Public Health, they identified a number of reasons why it didn't need to be closed down. I am certainly not in a position to evaluate that, but there were a number of reasons that they did provide, which we do have in the report.

Ms. DELAURO. Dr. Rhodes.

Dr. RHODES. Absent understanding the lethal dose question, and that's really at the heart of your question, you're saying, were people exposed to a lethal dose? And as you heard from Colonel Henchal and in the discussion, no one can give you that answer right now. So we, the GAO, aren't in a position to make that statement, but we can say those are the two items or factors that need to be brought in. What is a lethal dose? And it can't be just geared toward what's called the LD50, the lethal dose for 50 percent of the exposed population, because now that we have the—you have outlines as it were, the woman in Connecticut who is dead from inhalation anthrax, that proves that the lethal dose for 1 percent is real and those things need to be factored in to the decision—the discussion you are having.

Ms. DELAURO. Dr. Hamilton.

Dr. HAMILTON. I agree with Dr. Rhodes. We have that seminal question that needs to be addressed. But given the fact that the results were withheld because of a conclusion that the methods were not validated or not validatable at that point, I think the conservative thing would have been to close the facility and to test it with other methods bringing in a consensus, consensus from other governmental agencies that have different approaches.

Ms. DELAURO. Thank you.

Thank you, Mr. Chairman.

Mr. SHAYS. Thank you, let me take my time and begin, Mr. Hamilton. You have sampling equipment; is that correct?

Dr. HAMILTON. We have an example of various methods of sampling.

Mr. SHAYS. Why don't as you describe it, talk about its benefits and limitations.

Dr. HAMILTON. I am going to ask my colleague, Barry Skolnick, who was instrumental in getting this information. Many of the items came from NIOSH, and the vacuum sampling device came from us as well.

Mr. SHAYS. You are going to need a mic?

Mr. SKOLNICK. My name is Barry Skolnick.I am an association of Dr. Hamilton's at Johns Hopkins, and thank you for this opportunity.

Mr. SHAYS. Tap this mic.

Mr. SKOLNICK. We came with the courtesy of the folks at the National Institute for Occupational Safety and Health. We have a few examples to put some physical realities to some of these ideas. We have examples of the swab, the wipe and the HEPA vacuuming device, the kind that were used, and we can say a few things about them.

This is a swab. You are all familiar with this so-called Q-tips type of thing. What's important to say about this, it's like your toothbrush. How many different ways are there to use a toothbrush? There are a lot. And one of the issues in our concerns in looking into this matter is the general vagueness of some procedures as to how to use it. So you have to keep in mind that we talk about a device, there is not a unitary definition of what that means. It's a matter of a system of what materials are used, different commercial items, the method by which they're used, and the method by which they are extracted and analyzed in the laboratory.

So what you're seeing now is only part of the story and is it not necessarily the best or optimal way of doing it. But this is a swab which was intended to sample small areas. I think it's instructive to point out that both CDC and the Postal Service called for about a 100 centimeters squared coverage area, about 4 by 4 inches.

There's at least two other procedures we know of, one by the National Aeronautics and Space Administration as part of their Planetary Protection Program. It's about 25 years old. It calls for a quarter of that area, 2 by 2 inches for sampling. There is a European procedure that was just validated in 1997 that called for a fifth of that area, 20 square centimenters. As far as we know, no one has looked at this to see whether you can cover 100 square centimeters with a swab with any thoroughness or reproducibility. And it is the kind of question that needs asking. That is why a peer review and an organized process is needed. But I would also say, going back to NASA again which we understand is an agency under your jurisdiction, they have a very impressive record over 30 years in this planetary quarantine or planetary protection process of using swabs to look at the surface of spacecraft and achieving very high sensitivity down on the order of 300 spores per square meter, it's a number, which is their contractual standard and they've published on this. With swabs they are able to do this on the clean surfaces of spacecraft. So it is not necessarily true that a swab is inferior. It just may be that the procedures that have been used recently are not really validated for the purpose to which they were being used. So that's a snub.

Mr. SHAYS. And the advantage of it being wet versus dry?

Mr. SKOLNICK. We can say, categorically, that we have gone back to the literature, back to 1917 when the "swab rinse" assay was first in the literature. Swab being the device and rinse being the wet extraction technique for environmental sampling. We found nothing in the entire literature that we have looked at that justi-

fies the use of a dry swab for this purpose. In the doctor's office, the dry swab is used to take a throat specimen where you use it to pick up moist tissue samples. If the surface were moist, you would use a dry swab. But to look at dry surfaces, there is simply nothing we have seen that represents a prior history that would justify its use. And the literature that has come since suggests it is not very effective.

So I think, clearly, a wet swab would be better, but there are different ways of doing a wet swab. And we don't go into all these details. We have indicated some that we think need looking into, and we don't necessarily have all the answers. But it is clear that wet is better than dry, not only in principle and in literature, but also indicated in performance as indicated at Wallingford and Brentwood.

The other thing I should say about the swab, imagine you are in one of these personal protective equipment ensembles, "spacesuit," "moonsuit," thick gloves and then a second layer of gloves, and you have to open the package that the swab is in in a sterile fashion, so you don't cross-contaminate it. One of the issues involved is interoperability and the practical issues for using in these devices is considering the entire range of the context in which you are using them. And I'm not saying they're using them in just this way, but it's part of a total systems problem, not only to have a device but to consider the ways in which you use it in the entire process that are most practicable, and that can be made uniform. If you have 20 different teams in 20 different places doing this, how do you know they are doing in it in a similar fashion according to some quality assurance and have trained in a proficient manner? These are issues that need addressing.

The next one is the wipe and this has some interesting related matters. This is gauze of the kind that you are familiar with. It was sent to us by NIOSH. Illustrating the 3 by 3, it would be wiped and folded and wiped again. We have no expertise in this directly ourselves, but, again, we have looked at literature. NASA has had a wipe-rinse procedure since approximately 1980 that has been standardized and practiced. They don't use a wipe like this. They use a wipe that is 10 by 10 inches, not 3 by 3 or less, in a certain way and certain manner. And the question that arises for us is, why are these wipes being used instead of the other? Undoubtedly, this could be handled in less fluid, but we don't know what the basis is of using the small wipe. And I would point out that the original wet wipes that were used at Brentwood gave a very poor result. They were cotton. These are noncotton, so there are some questions here. But I'm pointing here, again, with a pitch again, NASA has a history of relevant technology. That agency has not been part of the bioterrorism or the terrorism response activities of the Federal Government, that I am aware of, and maybe that is something you could look into. Of course, these are always used wet. The third procedure——

Mr. SHAYS. I don't want you to talk unless you are talking into the mic. We have to transcribe—I don't have to—in fact, the only one who is working here today, is the transcriber.

Mr. SKOLNICK. My apologies. The third type of device is called a HEPA vacuum cleaner. "HEPA" means high efficiency particulate air.

If you look into this thing you would see a lot of folded paper material which is very good at trapping small particles and has a high capacity. That's the HEPA filter. We actually have a double filtering process here. That is recommended by NIOSH, and they have been using this for some years now. It's been used in remediation for asbestos and other environmental particulates for a considerable period of time. You trap the small things in here, so they don't get out in the environment from your vacuum. But the filter they are talking about is a different device, put in a different place. This is, as Dr. Hamilton showed you, called a nozzle sock, a dust collection trap. And it is inserted at the end of the hose, something like this, so that this little filter will trap the small particles off the surfaces that you are trying to collect from. And this is the kind of setup, the kind of arrangement that was used and held down by hand against surfaces to collect the HEPA vac samples, including the famous ones of the 3 million spores at Wallingford and so forth.

So it has a certain advantage of having a larger or smaller area of coverage much more than the other, but it has some issues too particularly the validation of its procedures. So that's my presentation.

Mr. SHAYS. Thank you very much.

Before I go to Mr. Kucinich, I would like to ask Dr. Melling—you stood up and you were sworn in. Dr. Melling used to be the Director of Porton Down in Great Britain, and I am interested to have you tell us—are you a U.S. citizen now?

Dr. MELLING. Permanent resident.

Mr. SHAYS. How would Great Britain have dealt with this issue?

Dr. MELLING. What I say is somewhat speculative because they were never faced with—we had two incidents. We had an island that was contaminated in 1942–43 as a result of joint U.S. British biological warfare experimentation. And that island was closed to the public and any visitors for 40 some years until it had been decontaminated, and until post decontamination samples were proved negative and until sheep had been let loose on the island—I think it was for two consecutive summers—and all the sheep survived. At that point people were sufficiently confident that the island was safe, and it was then returned to its original owners. The cost of that was several million dollars. It was worth spending that money to decontaminate. The second incident was, I think, it was the late 1980's. Kings Cross Station in London was undergoing refurbishment in London, and the original station roofing area had been insulated with horse hair. This must have been the 1800's. That horse hair turned out to be contaminated with anthrax. The appropriate areas in the station were sealed off and the horse hair was removed. There was decontamination carried out, and, again, post that procedure, confirmation that no antrax could be found. So I think, and my opinion is that I agree with Colonel Henchal in his written statement, that in the absence of detailed and good scientific knowledge, prudence is the sensible course. And I agree with Dr. Hamilton that a key issue is to have well-validated test

procedures. And in the absence of well-validated test procedures, we, again, don't know enough to make sense or judgment.

And I will conclude in a remark, there was a British scientist, Lord Kelvin who said, "If you can't put numbers on it, it's not science."

Mr. SHAYS. Thank you very much. You may stay there.

Thank you, Mr. Kucinich, for your patience, and good to have you here.

Mr. KUCINICH. Thank you very much, Mr. Chairman and members of the committee.

Mr. Chairman, I want to thank you for holding this hearing, and I want to say that when we're looking at trying to protect those who work for our government and the general, public from any kind of a biological attack, I think it's instructive to do what we are doing here, which is to look at how systems can be and have been improved to provide detection and protection. I also think, though, that we're only really at half-measures here, and this is by no means criticism of our distinguished Chair, who I have the greatest respect for, because to talk about as we are today, prevention, without talking about the events of 2001, is to really miss an opportunity to reflect upon where that anthrax came from.

Now, Colonel, you are from Fort Detrick, MD?

Colonel HENCHAL. Yes.

Mr. KUCINICH. Prior to September 2001, did you ever have any discussions with officers in charge of biological agents at Fort Detrick, MD where they work on research and development of such agents? Did you ever have any discussions of the custody of any biological weapons, agents over at Fort Detrick? In the event those agents ever came out of a laboratory there?

Colonel HENCHAL. The issue of biosurety was one—even as a principle, was one that only evolved after the events of 2001. Through its 34-year history, USAMRIID was principally an academic center.

Mr. KUCINICH. Could you speak a little louder, please?

Colonel HENCHAL. Until the events of 2001, the idea of surety as an issue for biological agents didn't exist. It only evolved after the events of that terrible October. Through its 34-year history, USAMRIID was principally an academic scientific institution, and the standards that we use were the same as were being used at the CDC or were being used at the National Institutes of Health. We never thought, and had tremendous confidence in our scientists, that agents from our laboratory would be taken or would be released in some nefarious way.

Mr. KUCINICH. So as you say there was never any discussion about what would happen if any of those agents were ever from that laboratory were ever released?

Colonel HENCHAL. Throughout our history, we did have systems to protect the work force and to protect the Fort Detrick community in Frederick. We have extensive, and have always had extensive, security and extensive restrictions on how to get to our laboratories. The issue for us had always been safety as the No. 1 concern. And that's pretty much how we were designed, based on safety, but not necessarily surety, which is really a different set of guidelines. We actually continue to have terrific records on the

agents we were using and we're in compliance with the new rules about how to ship the agents that were put in place in the late 1990's.

Mr. KUCINICH. When you speak of surety, tell me immediately after the incident of the release of the anthrax, did you have any discussions with any of your associates at Fort Detrick relative to the fact that the anthrax may have come from a government laboratory at Fort Detrick, MD?

Colonel HENCHAL. No. We really didn't. That was so far out of our mind that the people that were working and had dedicated their lives to biological defense would be involved in this event. We were concentrating in responding to the national response. And it was actually a complete surprise to us, come December and January, when those suspicions started to be raised.

Mr. KUCINICH. And do you know now? Do you know now whether or not Fort Detrick was the source of a strain of anthrax that ended up in circulation?

Colonel HENCHAL. There's no question that the strain—the Ames strain was isolated at Fort Detrick, but that doesn't necessarily implicate the institution or the scientists that work there in making the materials.

Mr. KUCINICH. What does that mean then?

Colonel HENCHAL. It means that many people had access to the actual strain; these are replicating agents. And this was a particular strain that was under study in many different laboratories, not only in ours, but also at the CDC, in academia, all had access to the strain eventually by the late 1990's. We shared the strain with our colleagues at Porton Down even. But because these are replicating agents, someone can take those materials and use them in a way that USAMRIID would be completely unaware of. This is not something that has defined quantity that you can follow and know exactly how many organisms are there all the time. These are replicating agents. And so while we originally made the isolation of the strain, any other trained microbiologist and a few others would have been able to take that material and replicate it and use it in a way that we all had to respond to.

Mr. KUCINICH. Once you have isolated the Ames strain of anthrax as being the strain that was present at Fort Detrick, what efforts were made—what scientific efforts were made to be able to determine what other possibilities are that strain could have come from someplace other than Fort Detrick?

Colonel HENCHAL. Well, that is in the hands of the FBI. Almost immediately after the events of October, the FBI has been at USAMRIID to try to make that determination. They relied on a lot of the shipping records that we had back to the 1980's, where they could pinpoint locations where the strain had been shared.

It's important to remember that USAMRIID did not have the capability and does not currently make living preparations of dried spores. So that particular capability didn't exist at USAMRIID.

Mr. KUCINICH. Are you prepared to say that there is no way that that anthrax could have come from Fort Detrick, MD, the anthrax that was in circulation?

Colonel HENCHAL. I have doubt that it came from USAMRIID, primarily because we don't have much of the equipment really necessary to really make dried spores, viable dried spores in that way.

Mr. KUCINICH. Have there been any personnel changes over there since October 2001 with respect to people who had custody of those agents?

Colonel HENCHAL. I'm not aware of any particular turnover. We have personnel turnover all the time.

Mr. KUCINICH. But not particularly anyone who had custody of those agents?

Colonel HENCHAL. No, sir.

Mr. KUCINICH. And since the events of 2001, what kind of security procedures have you put in place with respect to the custody of not only anthrax but any other biological agents that are present at Fort Detrick?

Colonel HENCHAL. I appreciate that question, and especially within the last year, I can say that USAMRIID has increased not only the physical security of the agents but also its safety program. We have quite a comprehensive program now. We are in compliance with DOD regulations within 90 days after I took command, and we are approaching compliance with all the requirements of the new regulations described in 42 CFR Part 73 that specify additional measures be taken under the Federal Biosurety Program.

Mr. KUCINICH. What role do you see for the Centers for Disease Control in terms of helping coordinate programs that relate to an outbreak of biological agent in the general population?

Colonel HENCHAL. I believe they continue to be an important agency and a focus for efforts to respond to the public health threat represented by these agents.

Mr. KUCINICH. Do you think their position should be subordinate to it, or should it be a coordinated position?

Colonel HENCHAL. That's not my decision, but there certainly needs to be a way to coordinate all the interagency activities that are going on.

Mr. KUCINICH. Thank you.

Mr. Chairman, I just want to say that I think this is a very useful discussion that this committee is having today. I also think it would be useful for the American public, too, and for this Congress, which, as we know, had its conduct dramatically changed during those days, for us to once again revisit this question of the origins of the anthrax, nature of the anthrax attacks. The American people still don't know. I think people have a right know and think this is the committee to do it, and I would just appeal to the Chair's thoughtfulness and consideration of this. Thank you very much.

Mr. SHAYS. I thank the gentleman.

We're going to get on with our next panel, but before you get up, is there anything that any of you need to put on the record? Mr. Ungar, Mr. Rhodes, Dr. Hamilton, Colonel, anything you need to put on the record that we will be happy as part of the record? All done? Thank you all very much.

Our next panel will be Mr. Thomas Day, vice president of engineering, U.S. Postal Service; Mr. William Burrus, president, American Postal Workers Union; Captain Kenneth Martinez, engineer, Centers for Disease Control, accompanied by Dr. Bradley Perkins.

We'll have them sit up front, and then we'll have Dr. James L. Hadler, State epidemiologist, State of Connecticut, Department of Public Health; and Mr. R. Davis Layne, Deputy Assistant Secretary, Occupational Safety and Health Administration.

You might stay standing because we're going to swear you all in, if you will stand, even if you were sworn in the first time.

[Witnesses sworn.]

Mr. SHAYS. For the record, our witnesses have responded in the affirmative.

We thank you very much for being here. We thank you for your patience. I think you've heard some of the questions that have already been asked, so you may want to incorporate it in your statements. We're looking for 5-minute statements. You can run over, but not too much longer than that. And the clock will go 5 minutes, and it will show red, and then we will tip it over again for the other 5 minutes. But, again, if you try to stay as close to the original 5, that will be helpful. We will start with you, Mr. Day, and then to Mr. Burrus, then Captain Martinez, and then we will go to Dr. Hadler and Mr. Layne. All right.

STATEMENTS OF THOMAS G. DAY, VICE PRESIDENT OF ENGINEERING, U.S. POSTAL SERVICE; WILLIAM BURRUS, PRESIDENT, AMERICAN POSTAL WORKERS UNION; KENNETH MARTINEZ, ENGINEER, CENTERS FOR DISEASE CONTROL, ACCOMPANIED BY BRADLEY PERKINS; JAMES L. HADLER, STATE EPIDEMIOLOGIST, STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH; AND R. DAVIS LAYNE, DEPUTY ASSISTANT SECRETARY, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

Mr. DAY. Thank you, Mr. Chairman and members of the subcommittee. My name is Thomas Day, and I'm the vice president of engineering for the U.S. Postal Service.

Generally my job involves the development of internal processes policies and equipment that make the Postal Service move the Nation's mail more efficiently, effectively and as quickly as possible. However, over the last year and a half, a major part of my duty has been responding to the anthrax attacks of 2001 and improving our system defenses to minimize the effects of any future attacks. I appreciate this opportunity to speak to you today about the Postal Service's progress in addressing this unforeseen situation.

Tragically, the mail was the vehicle for a terrorist attack on our Nation. It required a massive and coordinated response by the Postal Service, a response that was successful only with the help and support of so many others from all levels of government and the private sector. Unfortunately for all of us, information available at the time was simply inadequate to serve as a reliable road map through uncharted territory. But we must recognize that while the Nation's mail system was selected to deliver anthrax in 2001, there are many other agents that can be delivered in other ways. Bioterrorism is not just a Postal Service issue.

Considering my experience over the last year and a half, if there's a theme to my remarks, it would be lessons learned. After the anthrax attacks of October 2001, our primary goal then, as now, was protecting the safety of our employees and customers. At

the national level we saw the need to test and monitor our major mail processing facilities to detect potential employee exposure and limit the possibility of cross-contamination. We worked quickly to test more than 100 of these facilities.

While the anthrax crisis affected the Postal Service in many locations throughout the Nation, I will focus on the three phases of the situation in Connecticut.

The first phase began in October 2001 in response to potential presence of anthrax throughout the Postal Service network. As was happening throughout the Nation, the Connecticut district manager activated a crisis command center. Activities included an employee safeguard program to provide clear, consistent and accurate communications to employees through a single reliable channel, including employee town hall meetings to discuss facility testing. There were also daily communication links with union and management association leadership, which provided a feedback channel for employee and union concerns.

Initially it did not appear there were any problems in Connecticut. By late November, however, we learned that a Connecticut resident was thought to have inhalational anthrax. Mail was suspected as the possible cause. This was to be the beginning of phase 2 of our experience.

Mail received at the victim's home in Oxford would have passed through our Southern Connecticut Processing and Distribution Center in Wallingford. We immediately began testing at the Wallingford facility and informing employees of the situation and providing them antibiotics. When testing found the anthrax contamination on four pieces of automated mail sorting equipment, these machines were immediately taken out of service, the areas isolated and cordoned off.

The report triggered a coordinated multiagency response that included additional testing, decontamination, continued medical prophylaxis of employees and extensive employee communication activities. Employee unions were briefed on the sampling result and decontamination plans. The plant manager, the medical officer, and union official held town meetings with employees to discuss the result.

The Connecticut Department of Health, the Centers for Disease Control, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency worked directly with Postal Service headquarters Incident Command Center and the Connecticut Crisis Command Center to formulate the decontamination strategy for the equipment. Throughout the decontamination process we were advised there was no additional health risk to our employees.

Let me touch on the issue of sampling for a moment, because it was and remains a complex and evolving process.

Postal Service contractors had used a dry swab sampling because this technique was recommended by the Nation's public health laboratories. These laboratories were performing the analysis and felt this was the best sample collection means available to maximize laboratory resources. In subsequent rounds of tests conducted by the CDC at Wallingford, they used a number of sampling protocols, including wet wipes and a newly developed HEPA filter vacuum process. At the time there was no single standard for testing.

Today the value of these new sampling methods is widely recognized and is a part of our sampling protocol.

The third phase of the anthrax situation began in February 2002 when union leaders at the processing center requested a general cleanup that would include the high bay area. Local management acted prudently and decided first to conduct testing of the high bay area. Their concern was that without testing the presence of anthrax, cleaning could dislodge anthrax spores that might be present. Working with public health and environmental agencies, consensus testing protocols were developed, and a high bay sampling was conducted, an operation that was conducted during a point where they reduced operations to 12 hours that day.

After learning that the tests were positive for the presence of anthrax, both CDC and the Connecticut DPH indicated that no medical intervention was necessary because of the length of time since the suspected cross-contaminated letter passed through facility, and the fact that no employee had become ill.

Like so much that occurred during the anthrax crisis, actual decontamination of the high bay had no precedent. The process was uniquely shaped by the interagency guidance of OSHA CDC, EPA and the Connecticut DPH.

We recognize that questions have been raised about the Postal Service's decision in connection with the events at the Wallingford facility. We believe that the GAO has provided the proper context by describing them as understandable given the challenging circumstances of the time, the advice received from public health officials, and ongoing criminal investigation and the uncertainties about sampling methods.

There are always opportunities for improvement in our future communications efforts regarding anthrax or other biohazards. I assure you that our focus will remain on providing complete and accurate information to our employees as promptly as possible regarding any situation that may affect their health and safety.

We also believe that explanation of any test result should continue to be handled in conjunction with the appropriate local health care experts. The subcommittee asked that I specifically address the terms "validated" and "confirmed" as they appeared in our anthrax guidelines. Validation involves three distinct activities in connection with our sampling activities: First, verification that the samples were taken; second, logging the samples under chain-of-custody procedures; and finally, verification the samples were taken according to established laboratory protocols, including adherence to quality assurance and quality control.

The confirmed sample was a culture sample for which we received a final written report from the laboratory that the sample, based on quality assurance and quality control determinations, was either positive or negative for the presence of Bacillus anthracis.

We recognize these terms have resulted in some confusion, and as a result they will be eliminated in this context. However, we will retain robust quality assurance and control procedures to ensure we have the same level of accuracy and reliability for all future sampling and testing.

The Postal Service must also consider what lessons learned could mean for the future. This is addressed in our comprehensive emer-

gency preparedness plan that was submitted to Congress on March 6, 2002 and was updated this past month. There are four basic strategies in the plan: detection, containment, neutralization and deterrence. Since June 2002, we've been testing bio detection infiltration equipment for use at our automated mail processing centers. We have carefully reviewed the results and are now confident that our biohazard detection system is working successfully.

We've also evaluated a ventilation filtration system at a number of our processing centers. This provides the opportunity to contain potential biohazards in the mail as it moves through our processing operations.

There's one other issue I'd like to raise: indemnification. Working with the Department of Homeland Security on this issue, the indemnification of contractors has been a significant obstacle in the cleanup of the Washington and Trenton facilities as well as the purchase of the biohazard detection equipment. Some potential suppliers have been unwilling to offer essential products and services unless they are indemnified against claims arising out of acts of terrorism.

As I mentioned earlier, the anthrax attacks of 2001 happened to the U.S. Postal Service as the vehicle of the attack. There is no reason to believe that another bioterrorist would choose the same delivery vehicle or the same biohazard. Bioterrorism is not just a Postal Service issue. It is one that requires a strong and coordinated national response.

Perhaps the most valuable lesson I have learned through my experience with this issue is that deterrence is infinitely preferable to acting after a system has been breached. No one, certainly not our employees or our customers, should be forced to pay so high a price.

Thank you, Mr. Chairman. I'll be happy to answer your questions.

Mr. SHAYS. Thank you very much.

[The prepared statement of Mr. Day follows:]

Testimony of
Thomas G. Day,
Vice President, Engineering,
United States Postal Service
before the
U.S. House of Representatives
Committee on Government Reform
Subcommittee on National Security, Emerging Threats and International Relations
May 19, 2003

Good morning, Mr. Chairman and members of the subcommittee. I appreciate this opportunity to meet with you today to report on the progress of the United States Postal Service in developing anthrax detection and notification protocols at our facilities.

Tragically, the mail was the vehicle for the first bioterrorist attack on our nation. This required a massive and coordinated response by the Postal Service – a response that was successful only with the help and support of so many others from all levels of government and the private sector.

Our experience has resulted in the development of policies, processes and the acquisition of technology that can limit the consequences of any future mail-related bioterrorist act. However, the Postal Service can act only within the scope of its mission. Ultimately, the best defense against bioterrorism is deterrence. Constructing additional defenses to the mail system can, of course, serve as a deterrent to future acts. But in limiting the use of the mail for such acts, future attacks may simply shift to other means.

While the postal system was selected to deliver anthrax in 2001, there are many other agents that can be delivered in many other ways. Bioterrorism is not just a Postal Service issue.

Considering my experience over the last year and a half, if there were to be a theme to my remarks, it would be "lessons learned".

After the anthrax attacks of October 2001, the Postmaster General immediately pledged that the Postal Service would do all it could to limit the effects of any similar, future attack.

This was a situation never before encountered. While the Postal Service worked closely with – and relied upon – the healthcare experts during this crisis, the very uniqueness of the situation meant that there was only limited existing information available.

Ensuring the safety and security of our employees and customers was, and continues to be, our highest priority. We made every effort to move quickly to do this and to safeguard the mail.

At the national level, the Postal Service quickly realized the need to test and monitor our major mail processing facilities and set up a schedule to test more than 100 of these plants.

While the anthrax crisis affected the Postal Service in many locations throughout the nation, I will focus on the situation in Connecticut.

There were three phases to the anthrax situation in Connecticut. Let me go over the details of each phase.

Phase I began in mid-October, 2001, in response to the potential presence of anthrax throughout the Postal Service network. To help control this crisis, the Connecticut District Manager activated the District Crisis Command Center on Sunday, October 14, 2001. This included the Employee Safeguard Program, which began two days later.

This center managed the anthrax related incidents even before positive analytic results were discovered in the Southern Connecticut Processing and Distribution Center in Wallingford, Connecticut.

The fact was, throughout the nation, the Postal Service was responding to numerous reports of white powder in envelopes and on the mail. While these generally involved harmless substances innocently mailed or used in connection with the preparation of some mail, it was necessary that each incident be taken seriously.

Against a backdrop of real and potential threats, the Employee Safeguard Program was a vital tool in providing clear, consistent and accurate communications to employees through a single, reliable channel. This strategy was a critical element of the Connecticut District's success during the first phase of the crisis, helping to separate rumor and speculation from fact.

This was a significant positive step in controlling the crisis.

Augmenting the Employee Safeguard Program was the daily communication link with union and management association leadership. This provided another avenue of consistent messaging while building in a feedback channel for employee and union concerns.

As part of the phase 1 process, the Southern Connecticut Processing and Distribution Center manager immediately scheduled Town Hall meetings with all plant employees to explain the situation and process to be used for testing at the facility, as part of the nationwide testing plan.

The Plant Manager personally spoke at each meeting along with union leaders and medical personnel. Interpreters for the hearing impaired were also present to ensure everyone received the same information. Additionally, the Postal Service's Employee Assistance Program provided on-site assistance for anyone requesting services.

It was decided that all Town Hall meetings would be conducted with local management to help maintain a sense of trust and normalcy to the greatest extent possible.

The local managers were responsible for implementation of any operational changes, since they were in the best position to provide the information as it became available.

The Connecticut District Medical Officer was on site at each meeting to answer questions as they arose. This proved to be very beneficial as the answers came directly from a medical professional.

On October 26, 2001, we updated all employee phone numbers, addresses, and emergency contact phone numbers to ensure that our Connecticut District would be ready for any emergency.

The second phase of the Connecticut anthrax situation began when we learned that a Connecticut resident was suspected of having contracted inhalation anthrax on November 20, 2001. Mail received at the victim's home in Oxford would have passed first through our Southern Connecticut Processing and Distribution Center in Wallingford. We immediately began testing at the Wallingford facility, informing employees of the situation, and ensuring that antibiotics were provided to them.

This situation resulted in a series of three tests at the facility. The first, conducted by the Postal Service through a contractor, occurred on November 21. The results of the samples taken were negative for the presence of anthrax.

At its request, testing responsibility shifted to the CDC on November 25. We welcomed CDC's involvement and its efforts to continue more aggressive testing. While the results of CDC's initial test at the facility, conducted on November 25 and involving 60 samples, were also negative for anthrax, a subsequent test on November 28, and involving 212 samples, with six positive results spread over four pieces of equipment, Delivery Barcode Sorters 4, 6, 10 and 11.

Based on these results, the state's Chief Epidemiologist later identified 1.9 million colony-forming units of anthrax – about 3 million spores – in a sample collected from the heavily contaminated machine. A second sample identified 370 colony-forming units from another machine.

Antibiotic prophylaxis had already been provided to employees beginning on November 21, prior to the sampling, just as a precaution.

The four contaminated machines were immediately taken out of service, the areas isolated and cordoned off.

Our December 2, 2001 receipt of information showing that test results had detected the presence of bacillus anthracis at the Southern Connecticut Plant triggered a coordinated, multi-agency response that included additional testing, decontamination, medical prophylaxis of employees and extensive employee communication activities.

Employee unions were briefed on the sampling results and decontamination plans. The Plant Manager, the Medical Officer and union officials held employee Town Hall meetings on December 2 and December 3 to discuss the test results. Consulting with local health officials and the Occupational Safety and Health Administration – the best guidance available at the time – we were advised that our description of the qualitative nature of the contamination was reasonable.

From the earliest discovery that someone had used the mail for domestic terrorism, it has been our policy to consult with our union leadership and to share information with our employees and the public. This was true at the national level and at the local level.

As with the cases in Trenton, New York City, and Washington, D.C., Postal Service managers consulted with local union leadership along with local health officials and CDC to determine the proper course of action.

At the national level, union leadership received the same information in the same meetings at the same time that we did. At the local level, management and union leadership attended the same meetings with local public health officials and the CDC.

Throughout the entire process, these meetings were scheduled to allow for the delivery of all information available. Employees were allowed the necessary time for questions and answers regardless of how long it took.

As the anthrax event intensified, the Town Hall meetings became more frequent and included state and federal government leaders.

The Connecticut Department of Public Health, the CDC, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency worked directly with Postal Service's Headquarters' Incident Command Center and the Connecticut Crisis Command Center to formulate a decontamination strategy for the four identified pieces of mail equipment.

On December 3, we began erecting containment structures over the contaminated equipment. Actual decontamination began the following day.

The Connecticut District also implemented contingency plans and continued medical prophylaxis plans in coordination with state and local public health officials.

Let me take a step back for a moment and touch on the issue of sampling, because it was – and remains – a complex and evolving process.

The approach taken by the Connecticut District from the beginning was consistent with the Postal Service's Interim Guidelines that were eventually issued on December 5, 2001, and were based on ongoing daily guidance from state and federal public health experts.

Until November 21, the Postal Service had used its own contractors to collect environmental samples. The CDC assumed this responsibility on November 25.

Postal Service contractors had used "dry swab" sampling because this technique was recommended by the nation's public health laboratories. These laboratories were performing the analysis and felt this was the best sample collection means available to maximize laboratory resources.

When CDC begin its second round of testing at Wallingford, they, along with the Connecticut Department of Public Health, chose to undertake sampling using "wet wipe" and a newly developed High Efficiency Particulate Air filter vacuum process.

All parties recognized the value of these new sampling methods. In fact, when CDC issued nationwide sampling guidance in April 2002, it documented the state-of-the-art sampling strategies developed at the Southern Connecticut Processing and Distribution Center.

The third phase of the Connecticut anthrax situation began in February 2002, when union leaders at the Southern Connecticut plant requested a general cleanup that would include the "high bay" area of the facility. The "high bay" area is defined as the portions of the building starting about eight feet above the floor grade.

Local management reacted prudently and decided, first, to conduct testing of the "high bay" area. Their concern was that, without first testing for the presence of anthrax, cleaning could dislodge anthrax spores that might be present.

Postal Service Headquarters officials, working with the Connecticut District officials, developed a national policy addressing the cleaning procedures in postal facilities that were previously sampled for potential B. anthracis contamination.

These procedures were issued on February 28, 2002. Pre-planning began at that point for the testing of the Southern Connecticut facility "high bay" areas. The process included contingency plans for possible decontamination of the facility and relocation of employees to other facilities if necessary.

This phase involved all levels of Postal Service management from Headquarters to the facility level and the guidance of at least seven different federal and state public health and environmental agencies. They included the Occupational Safety and Health Administration, the Environmental Protection Agency, CDC, the National Institute for Occupational Safety and Health, the Connecticut Department of Public Health and the Connecticut Department of Environmental Protection.

Testing protocols utilized during this period were developed by the Postal Service and its contractors and reviewed by all of the stakeholder agencies mentioned above.

The resulting consensus testing protocols were released for use by the Postal Service's contractor in mid-April, 2002. Numerous separate teleconferences were held during this period to coordinate the testing, decontamination and medical prophylaxis issues.

The strong inter-agency working groups that had been developed in November and December of 2001 became an essential element of the third phase of the anthrax situation in Connecticut. These working relationships were critical to the successful response to this event since local public health officials and the nation's leading public health experts were continuously sharing information.

Using the consensus testing protocols, "high bay" sampling was conducted April 21, 2002. In preparation for the April 21st sampling, the Plant Manager made the decision to reduce operations at the facility to 12 hours on that day. The plant normally runs twenty-four hours per day.

This decision was reached after lengthy consultations with union representatives, state and federal health officials, including the Occupational Safety and Health Administration and CDC. The goal was to minimize the potential risk of accidentally disturbing dust that might have contained B. anthracis.

Employees were permitted to take leave for that day, revise their work schedule, work at another facility or work in a different area of the building.

Test results of the samples taken on April 21, 2002, revealed the presence of B. anthracis. This resulted in immediate notifications to affected unions and management associations, as well as facility employees.

This approach to communication and notification was consistent with the Postal Service's Interim Guidelines. It also complied with guidance provided by the Occupational Safety and Health Administration, CDC and the Connecticut Department of Public Health.

Both CDC and the Connecticut Department of Public Health indicated that no medical intervention was deemed necessary as a result of these tests because of the length of time since the suspected cross-contaminated letter passed through the facility and the fact that no employees had become ill.

You will recall, too, that facility employees were placed on antibiotics, as a protective measure, in November, 2001.

Again, our plans included erection of containment structures and decontamination. It was decided that employees would not be allowed to work in the affected area of the facility while containment structures for remediation were being built.

Some employees were relocated to alternate locations for the period between May 4 and May 18. Partial re-occupancy of the affected operations areas began on May 18th and full operations were restored by June 10th.

This conservative approach avoided the potential for employee exposure to re-aerosolized B. anthracis during the construction of the containment structure.

It should be noted that the facility's Health and Safety Plan implemented for the remediation process was prepared with guidance from on-site OSHA and NIOSH representatives who found that this was a model plan that could serve as a template for other affected sites.

Like so much that occurred during the anthrax crisis, actual decontamination of the "high bay" area had no precedent. It was uniquely shaped by the inter-agency guidance of the Occupational Safety and Health Administration, the CDC, the Environmental Protection Administration, and the Connecticut Department of Public Health. I cannot emphasize strongly enough the value of their cooperation, assistance and expertise in helping the Postal Service to protect its employees and the people we serve.

The decontamination protocols developed for remediation of the "high-bay" areas improved upon those used in other affected Postal Service facilities in three ways. First, they added increased contact times for bleach when used as a disinfectant. Second, they incorporated spray-misting within the containment structures and, finally, they resulted in ongoing air sampling outside the containment structures throughout the duration of the decontamination process.

These revised cleaning protocols were not only an improvement over earlier protocols approved by CDC, but they also complied with the Environmental Protection Agency's new Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requirements governing the use of pesticide applications.

As I said, if my testimony today has a theme, it is "Lessons Learned."

As a result of our experience with "high bay" cleaning at the Wallingford facility, we have established specific procedures for the cleaning of all postal facility "high bay" areas.

The purpose is twofold: to significantly reduce the amount of dust and to limit the transmission of that dust in our facilities, thus minimizing the risk to our employees. Of course, employee safety and clear, effective communications remain our goal throughout the process.

We note, as did the General Accounting Office in its report on this incident, that none of the employees at the Wallingford facility became ill as a result of the anthrax contamination.

In fact, the General Accounting Office is on record as acknowledging that decisions made by the Postal Service relating to events that transpired at the Southern Connecticut facility were "understandable" given the challenging circumstances at the time, the advice received from public health officials, an ongoing criminal investigation and the uncertainties about the sampling methods used.

At the time, there were no guidelines and no designated regulatory agency for dealing with this type of situation. The Postal Service acted quickly and prudently to communicate pertinent information to its employees, relying upon the advice of public health experts.

We understand, however, that there are always opportunities for improvement in our future communication efforts regarding anthrax or other biohazards.

I assure you that our focus will remain on providing complete and accurate information to our employees as promptly as possible regarding any situation that may affect their health and safety.

The Postal Service recognizes the importance of releasing test results, including quantified results if available, to employees and others as quickly as possible. In communicating available test results, the testing methods used should be specified and any limitations of either the testing methods or the test results should be explained.

We also believe that this explanation should be handled in conjunction with the appropriate local health care experts.

The Postal Service will make every effort, as it did at Wallingford, to consult with appropriate federal, state and local agencies in deciding on appropriate communications to employees and others.

We are well aware of our obligation to release timely testing information to employees and the public. In the future we will be much clearer about the information we have and what it means.

With regard to the General Accounting Office's specific recommendations, the Postal Service is committed to working with the National Response Team – a coalition of 16 federal agencies with emergency responsibility for the United States – in making revisions to its Technical Assistance Document for anthrax response. The Postal Service became a member of the National Response Team as a result of our experience with anthrax.

The Postal Service fully realizes the challenges faced by the National Response Team in going forward on this issue. As revisions are made to the Technical Assistance Document, we will revise Postal Service guidelines in this area so that they are consistent.

With regard to concentration levels at the Wallingford facility, let me quote Bernard L. Ungar, Director, Physical Infrastructure Issues, for the General Accounting Office. He wrote to the Postmaster General regarding this issue on April 30th of this year. His response, in part, follows:

> . . . press articles . . . said that the Southern Connecticut Processing and Distribution Center in Wallingford, Connecticut, (the Wallingford facility) had the highest concentration of anthrax among post offices in the nation.

> Our report did not contain such a statement; nor did it contain data on anthrax contamination at all other postal facilities that were found to be have anthrax contamination around the fall of 2001.
>
> . . . Because it was not within the scope of our review, we did not collect anthrax test result data or other information on anthrax testing from other postal facilities that had positive test results and were therefore not in a position to assess overall contamination levels in various other postal facilities, including the Brentwood facility . . .

We are hopeful that Mr. Ungar's words will help to clarify some of the misunderstanding that has surrounded this issue.

As part of today's hearing, the Subcommittee specifically requested that the Postal Service address the terms "validated" and "confirmed" as they appear in our anthrax guidelines. I am pleased to address this issue.

An agreement was implemented on November 6, 2001 with the Association of Public Health Laboratories (APHL) network and an APHL liaison with representatives from the four national contractors collecting the samples nationwide who were domiciled at our Incident Command Center.

A validation procedure was established between the APHL liaison and the lead contractor representatives. "Validation" involves three distinct activities: verification that the samples were taken; logging the samples under chain-of-custody procedures; and verification that the samples were taken according to the established laboratory protocols, including adherence to applicable quality assurance and quality control procedures and our guidelines for the locations involved.

A "confirmed" sample was a culture sample for which we had received a final, written report from the laboratory that the sample, based on quality assurance/quality control determinations, was either positive or negative for the presence of B. anthracis.

We recognize that these terms have resulted in some confusion. As a result, they will be eliminated in this context. However, we will maintain robust quality assurance and quality control procedures to ensure that we have the same level of accuracy and reliability for all future sampling and testing.

As we continue our efforts to emerge from the attacks of 2001, the Postal Service must also consider what "the lessons learned" could mean for the future. As part of the conference report for the Fiscal Year 2002 Department of Defense Appropriations bill, Congress required the Postal Service to prepare a comprehensive Emergency Preparedness Plan. We submitted that Plan to Congress on March 6, 2002 and provided an update last month.

Following submission of the Plan, Congress appropriated $587 million through an Emergency Supplemental Appropriation to assist the Postal Service in responding to the attacks. Previously, the President came to our aid with $175 million to help us protect our employees, our customers and the mail. We are grateful for this help.

There are four basic strategies to the plan:

1) Detect biohazardous materials introduced into the mail stream as soon as possible;
2) Contain biohazardous materials identified in the mail stream as soon as possible;
3) Neutralize biohazardous material found in the mail stream.
4) Deter the use of the mail as a tool for bioterrorist acts;

Deterrence, clearly, is the preferred, overall strategy. Successfully deterring the use of the mail as a vehicle for biohazards would minimize the need for detection, containment and neutralization. Similarly, successful detection, containment and neutralization can serve as a deterrent.

We recognize, of course, that threats involving the mail could involve a full spectrum of biological, chemical, explosive and radiological agents. With this in mind, we have updated a detailed threat assessment to review all threats that may be directed at the Postal Service or that may use the Postal Service as a vehicle. We have been working at all levels of the organization to develop integrated emergency management plans, including continuity of operations plans, to address these threats by protecting our employees and providing for the continued movement of the mail.

Of course, our experience to date has primarily involved biohazards. Our Emergency Management Plan notes that the greatest opportunities to prevent or limit the damage of covert nuclear, biological, chemical, or conventional explosive attacks exist during the first phases of the incident.

Therefore, our Emergency Preparedness Plan places a premium on threat identification, and providing protection to our employees and customers at the earliest feasible point in our mail processing system.

So, in implementing the Plan, the Postal Service is looking at a variety of process changes and technology initiatives that can be applied to the threat of biological, chemical and radiological hazards in the mail.

To that end, we have been testing bio-detection and filtration equipment for use at our automated mail processing centers.

In fact, since June of 2002, the Postal Service has been testing a biohazard detection system at the Baltimore Processing and Distribution Center. We have carefully reviewed its results and we are now confident that it is working successfully.

The Biohazard Detection System was developed for the Postal Service following consultations with the military, federal agencies, and other experts. The interagency work group that tested and evaluated the system design included: The United States Army Medical Research Institute of Infectious Diseases; The National Institute of Standards and Technology; The Department of Agriculture; and The Johns Hopkins Applied Physics Laboratory.

From October of 2001 to September 2002 more than 20 systems were tested.

Next month, we will begin a 30-day test of the System at 14 sites throughout the nation. The sites were chosen because they represent a wide variety of climates and environments. Sites include some rural areas which, because of the presence of livestock, may contain naturally occurring anthrax.

The system is installed on our Advanced Facer-Canceler System, which is the first physical pinch point in our processing system. Mail at this point is manipulated through a series of belts and rollers and arranged so that it is all facing a single direction so that the stamps can be cancelled and the postmark applied. It is at this point that powdered substances in the mail can be forced out into the surrounding air.

As the mail moves through a collection hood on the system, air is constantly sampled and drawn into a cabinet where any particles it contains are mixed with a liquid. The liquid is then injected into a cartridge which moves to a detection device where it is compared to a template of anthrax DNA. If there is a match, facility managers are notified, the facility is evacuated and a local emergency response plan is activated.

Communication with our employees and the community is a critical element of this plan. And, just as important is the coordination with local community first responders, like police, fire, rescue and public health.

The 14 test sites are: Lancaster, Pennsylvania; Midland, Texas; St. Petersburg, Tampa and Manasota, Florida; Dulles, Virginia; Los Angeles, California; Albany, New York; Tacoma, Washington; Kilmer, New Jersey; Cleveland, Ohio; Southern Maryland; Rockford, Illinois; and Pittsburgh, Pennsylvania.

The Postal Service has every confidence that these tests will be successful and we look forward to a nationwide rollout of the System to 282 mail processing facilities early next year.

We are also testing a ventilation and filtration system at our Cleveland processing plant. This provides the opportunity to contain potential biohazards in the mail as it moves through our processing operations. We are developing plans to expand this test to our Dulles and Merrifield processing facilities in Northern Virginia.

The viability of the Postal Service, and its value to the American people, is dependent upon an open and accessible system. In assessing and responding to potential threats, it is our intention to maintain an accessible postal system.

Since the anthrax attacks, the Postal Service has worked closely with the Office of Homeland Security and its successor, the Department of Homeland Security. We also appreciate the assistance we have received from the President's Office of Science and Technology Policy. Building upon our Emergency Preparedness Plan, we worked with Homeland Security in the development of a national Critical Infrastructure Plan.

The Office of Science Technology and Policy has established the Inter-Agency Working Group for the protection of vulnerable systems, a group on which I sit, with specific responsibility for the Mail and Package Working Group.

This group is evaluating existing technology, as well as providing guidance as to where research and development efforts should be best directed.

We also continue to coordinate with all appropriate agencies about mail security to assure the safety of America's mail system.

To that end, we would be pleased to work with this Subcommittee in any way possible to preserve the security and the value of the United States mail and protect the safety of our employees and all Americans.

There is one other issue I'd like to raise: Indemnification.

According to the General Accounting Office, both insurers and reinsurers have determined that terrorism is not an insurable risk at this time, and they could not afford to continue providing coverage for potential terrorism losses.

The Administration and Congress provided some financial assistance to the Postal Service to decontaminate facilities and to purchase equipment to provide safety to employees. While we are working with the Department of Homeland Security on this issue, the indemnification of contractors has been a significant obstacle in the cleanup of the Washington and Trenton mail plants, as well as the purchase of biohazard detection equipment.

As the Postal Service moves forward to secure biohazard detection systems, protective devices, and mail filtration and sanitation equipment, potential suppliers of some of this equipment have been unwilling to offer essential products and services unless they are indemnified against claims arising out of acts of terrorism.

The Postal Service strongly supports either legislation or an executive order that would allow the Postal Service to indemnify its contractors in the same manner as other federal agencies.

The Postal Service needs to enable contractors, who are providing anti-terrorism goods and services, to obtain appropriate liability insurance.

The American public supports, and expects, a safe, secure, and sound Postal Service.

Experience has also shown that the Postal Service can be used as a tool of terrorism. In the event of another catastrophic occurrence, the Postal Service could be faced with a potentially crippling liability, despite its unprecedented efforts to save lives.

Indemnification is critical to the protection of the mailing public and the more than 700,000 postal employees who serve them.

In conclusion, we take all these issues very seriously. And let me emphasize again that the tests we conducted at the Wallingford plant relied upon the best expert knowledge available at the time.

That knowledge base evolved and became more refined over time, as we became more familiar with the nature of the biohazard we were dealing with.

We will continue to coordinate with all appropriate agencies to assure the safety of our employees and local residents. And we will continue to share information with those employees and local residents as it becomes available.

One final note: as I mentioned earlier, the anthrax attacks of 2001 happened to use the United States Postal Service as the vehicle of the attack. Of course, we will continue to develop and implement system defenses in our efforts to limit the potential consequences of any future, similar attack using the mail. The greater our success in this area, the less likely it is that the postal system would be an attractive vehicle for bioterrorist acts. That would be welcome for the Postal Service, its employees and the people it serves. But it could lead future terrorists to explore other opportunities to disseminate biohazards. And there is no reason to believe that another bioterrorist would choose the same delivery vehicle or the same biohazard.

I cannot emphasize strongly enough that bioterrorism is not just a Postal Service issue. It is one that requires a strong and coordinated national response.

Perhaps the most valuable lesson I have learned through my experience with this issue is that deterrence is infinitely preferable to reacting after the system has been breached. No one – certainly not our employees and certainly not our customers – should be forced to pay so high a price.

Thank you, Mr. Chairman. I would be happy to address any questions you may have.

# # # #

Mr. SHAYS. Mr. Burrus.

Mr. BURRUS. Good afternoon. I want to thank subcommittee Chairman Christopher Shays, Ranking Member Dennis Kucinich and all the committee members for the opportunity to address this most important issue. I am accompanied today by John Dirzius, the president of the Greater Connecticut Area local representing over 100 offices in central Connecticut, including the Wallingford facility. My testimony today will concentrate on the events and issues surrounding the anthrax contamination of the Southern Connecticut Mail Processing and Distribution Center located in Wallingford.

When the anthrax crisis arose in October 2001, the terrorist attacks of September 11 were still vivid in our minds, and the national psyche was wounded. The mail had been used to transmit deadly anthrax, and two Brentwood postal workers were victims in late October. Other postal workers from Brentwood and Hamilton Township, NJ, were hospitalized with life-threatening infections. Thousands of workers were prescribed medication as a precaution. Postal workers were especially concerned, but, despite their fears, continued to work, serving our Nation with courage and dignity.

At the outset of the anthrax crisis, the Postal Service and the postal unions embarked on a cooperative effort to cope with the crisis, evaluate progress and facilitate communications at the national level. Members of the task force met almost daily, exchanging information and discussing options, and through most of this crisis, the course of action worked quite well. Unfortunately, the same level of cooperation did not exist at the local level in every instance. It certainly did not exist in Connecticut.

Shortly after the Brentwood deaths, the Wallingford facility, along with more than 250 other postal facilities, were tested for anthrax contamination using the swab sampling method. The results were negative at the majority of facilities tested nationwide, including in Wallingford. But when Mrs. Lundgren, a 94-year-old widow who lived in nearby Oxford, died of inhalation anthrax, contaminated mail was suspected. Fear gripped postal workers and nearby residents.

Three rounds of additional tests were conducted using variations of the swab method, and each produced a negative result, and finally, when the more sophisticated HEPA vacuum sampling was utilized, anthrax was detected. The presence of anthrax was described as being in trace amounts.

The situation at the Wallingford facility was reported at the national task force meetings, but the exchange of information, as we have subsequently learned, was incomplete. Quantitative results were not presented to the task force members. The failure by the Postal Service and State health department officials to provide important information was revealed in early January 2002 when a local APWU representative was verbally informed by a CDC official that contamination was significantly higher than had been reported to the union and to the employees. This was later confirmed in an e-mail the union had obtained through a Freedom of Information request made in April 2002, received in 2003. The December 2001 e-mail from the CDC official Larry Cseh says, "This is to discuss the findings of my sample from Wallingford P&D that is the highest ever collected at post offices."

There's been considerable disagreement regarding the level of contamination in the Connecticut facility. Test results put the number of spores found at approximately 3 million. While the significance of this figure has been hotly debated, clearly there was more than trace contamination, and, without question, there was sufficient contamination to cause death.

This raises a tough probing question. When do authorities have a duty to inform employees of threats to their safety and health? The evidence is clear that discussions were held among various agencies, including the Postal Service, the Centers for Disease Control and the Connecticut Department of Health regarding who would assume responsibility for notifying employees.

A GAO report issued in April 2003 went to great lengths to analyze documents that set forth responsibilities of the agencies involved. The report notes that the Postal Service requested and the investigation team agreed that the Postal Service would be the sole party responsible for communicating test results and other information to the workers at the facility. Yet the Postal Service failed to notify the employees and the union of the quantitative sample results. This failure to report the results was compounded by the failure to properly respond to a January 2002 request from local union presidents for documents detailing exposure. When it became clear that repeated union requests for exposure data was not being honored, the union petitioned OSHA to enforce the standard that requires employers to provide such data within 15 days of the request. OSHA failed to enforce its standard. It declined to issue a citation to the Postal Service, and the requested information was not provided for a period of a full 9 months after the initial union request.

The record, of course, also shows that while the requests were being made and denied, the Postal Service knew the results, CDC knew the results, and the Connecticut Department of Health knew the results. Those most directly concerned, the employees, did not know. Employees were not informed despite repeated requests for information by the local union. Yet the GAO concludes that given the circumstances, the failure to report the result is understandable.

We vehemently disagree. OSHA's failure to uphold its standard to protect workers and the Postal Service's continued refusal to provide anthrax exposure data is simply inexcusable. Nowhere in the Code of Federal Regulations for OSHA is there an exception. No matter how one interprets the regulations, employees were denied the fundamental right to make informed decisions regarding their safety and health. It is abundantly clear that postal workers in the Wallingford facility were denied the right to protect themselves from dangers in the workplace.

We feel it is far too easy to say, we learned our lesson, it will not happen again. Postal employees worked in the facilities that tested positive for anthrax, a toxin presumed by the medical community to be capable of causing death even when present in only minute amounts. Medical treatment that was offered as a protection was provided under false pretences. Postal workers are wary, and they should be. No one has been held accountable, and this failure is, in GAO's interpretation, understandable.

Let me say a word about the present effort to provide detection equipment. This equipment will go on specified postal equipment, not all of the equipment. The pieces of mail that the Postal Service handles daily does not go directly in the collection box or the customer to the letter carrier. It is commingled in postal facilities throughout this country. Over 50 percent of that mail bypasses the Postal Service system and goes directly to the carrier delivery station. It would be possible—there are over 200 private consolidation plants in existence in this country processing American's mail. They hire low-wage workers without background checks. It's very possible for a terrorist to be hired by one of these companies. That mail would never come through a postal facility that has biodetection equipment. It will go directly to the letter carrier, to the bag, to the American customer, to the American citizens.

Let me discuss for a moment a pattern of failure. We begin with the swab versus the HEPA system testing. We go to use of the word "trace contamination." Despite the union's two-decade-old effort to have the stoppage of the use of compressed air, of blowing postal equipment, we go from the use of compressed air to the vacuum system of cleaning postal equipment. We continued with the dispensation of Cipro as a means of protecting employees without a comprehensive study of the long-term effect on individuals who were not suffering any illness, and to date there's no medical documentation of the long-term effect on the thousands of postal employees and other Federal workers as well who took Cipro for extended periods of time. And many employees rejected the use of Cipro because they were informed by their employer, notably the U.S. Postal Service, that there were trace amounts, so employees were endangered unnecessarily because they received misleading information.

Mr. Chairman, members of the committee, I respectfully submit that the events surrounding the Wallingford anthrax contamination are not understandable, not to me and not to the workers I represent.

Thank you for the opportunity to testify before your committee. I will be happy to answer any questions you may have.

Mr. SHAYS. Thank you Mr. Burrus.

[The prepared statement of Mr. Burrus follows:]

Before the

House Subcommittee on National Security,
Emerging Threats and International Relations

Testimony Of

William Burrus, President
American Postal Workers Union, AFL-CIO

(May 19, 2003)

American Postal Workers Union, AFL-CIO
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Good afternoon. I want to thank Subcommittee Chairman Christopher Shays, Ranking Member Dennis Kucinich, and all the Committee members for the opportunity to address this most important issue. My testimony will concentrate on the events and issues surrounding the anthrax contamination of the Southern Connecticut Mail Processing & Distribution Center, located in Wallingford.

A Nation on Edge

When the anthrax crisis arose in October 2001, the terrorist attacks of September 11th were still vivid in our minds and the national psyche was wounded. The mail had been used to transmit deadly anthrax and two Brentwood postal workers were victims in late October. Other postal workers from Brentwood and Hamilton Township, New Jersey, were hospitalized with life-threatening infections. Thousands of workers were prescribed medication as a precaution.

Postal workers were especially concerned but, despite their fears, continued to work, serving our nation with courage and dignity.

Cooperation

At the outset of the anthrax crisis, the Postal Service and the postal unions embarked on a cooperative effort to cope with the crisis, evaluate progress, and facilitate communication at the national level. Members of the Mail Security Task Force met almost daily, exchanging information and discussing options. Through most of the anthrax crisis, this course of action worked quite well.

Unfortunately, the same level of cooperation did not exist at the local level in every instance. It certainly did not exist in Connecticut.

Wallingford

Shortly after the Brentwood deaths, the Wallingford facility, along with more than 250 other postal facilities, was tested for anthrax contamination using the swab sampling method. The results were negative at the majority of facilities tested nationwide, including Wallingford.

But when Ottilie Lundgren, a 94-year-old widow who lived in nearby Oxford, Connecticut, died of inhalation anthrax in November, contaminated mail was immediately suspected. Fear gripped Wallingford postal workers and nearby residents.

Three rounds of additional tests were conducted using variations of the swab method, and each produced a negative result.

Finally, when the more sophisticated HEPA vacuum sampling method was utilized, anthrax was detected. The presence of anthrax was described as being in "trace amounts."

Information Exchange Poor

The situation at the Wallingford postal facility was reported at National Task Force meetings, but the exchange of information, as we have subsequently learned, was incomplete. The quantitative results from sampling were *not* presented to task force members.

The failure by Postal Service and state health department officials to provide important information was revealed in early January 2002, when a local APWU representative was verbally informed by a Centers for Disease Control official that contamination was significantly higher than had been reported to the union and employees.

This was confirmed in an e-mail the union obtained through a Freedom of Information Act request made in April 2002 and received in April 2003. The December 2001 e-mail from CDC official Larry F. Cseh says, "This is to discuss the findings of my sample from Wallingford P&D that is the highest ever collected at post offices."

Troubling Question

There has been considerable disagreement regarding the level of contamination in the Connecticut facility. Test results put the number of anthrax spores found at approximately 3 million. While the significance of this figure has been hotly debated, clearly, there was more than "trace" contamination. And without question, there was sufficient contamination to cause death.

This raises a troubling question: When do authorities have a duty to inform employees of threats to their health and safety?

The evidence is clear that discussions were held among various agencies, including the Postal Service, the Centers for Disease Control, and the Connecticut Department of Health, regarding who would assume responsibility for notifying employees.

A GAO report issued in April 2003 went to great lengths to analyze documents that set forth the responsibilities of the agencies involved. The report notes that the Postal Service requested, and the investigation team agreed, that the USPS would be the sole party responsible for communicating test results and other information to the workers at the facility.

Yet the Postal Service failed to notify employees and the union of the quantitative sample results.

OSHA's Role

The Postal Service's failure to report the results of the Wallingford sampling was compounded by its failure to properly respond to a January 2002 request from the local union president for documents detailing exposure.

When it became clear that repeated union requests for exposure data were not being honored, the union petitioned OSHA to enforce the standard that requires employers to provide such data within 15 days of a request. OSHA failed to enforce its standard: It declined to issue a citation to the Postal Service, and the requested information was not provided for a full nine months after the union's initial request.

The record, of course, also shows that while the requests were being made and denied, the Postal Service knew the results, CDC knew the results, and the Connecticut Department of Public Health knew the results. Those most directly concerned – the employees – did *not* know. Employees were not informed, despite repeated requests for information by the local union.

Yet the GAO report concludes that, given the circumstances, the failure to report the results is understandable.

We vehemently disagree. OSHA's failure to uphold its standard to protect postal workers, and the Postal Service's continued refusal to provide anthrax-exposure data is simply inexcusable. Nowhere in the Code of Federal Regulation for OSHA is there an exception.

No matter how one interprets the regulations, employees were denied the fundamental right to make informed decisions regarding their safety and health.

Conclusion

It is abundantly clear that postal workers at the Wallingford facility were denied the right to protect themselves from dangers in the workplace. We feel it is far too easy to say: "We learned our lesson. It will not happen again."

Postal employees worked in a facility that tested positive for anthrax, a toxin presumed by the medical community to be capable of causing death even when present only in minute amounts. Medical treatment that was offered as protection against trace contamination was provided under false pretenses.

Postal workers are wary, and they should be. No one has been held accountable and this failure is, in the GAO's interpretation, "understandable."

Mr. Chairman, Committee members, I respectfully submit that the events surrounding the Wallingford anthrax contamination are *not* "understandable." Not to me, and not to the workers I represent.

Thank you for the opportunity to testify before your committee. I will be happy to answer any questions you may have.

Mr. SHAYS. Let me just say to you, the Members here, Ms. DeLauro, myself, Mr. Janklow, they are not understood by us as well, and we see no excuse for what you have to encounter, what your workers had to encounter, your members.

Captain Martinez.

Captain MARTINEZ. Good afternoon, Mr. Chairman and members of the subcommittee. I'm Captain Kenneth Martinez, Supervisory Industrial Hygienist for the National Institute for Occupational Safety and Health with the Centers for Disease Control and Prevention. With me is Dr. Bradley Perkins, Acting Associate Director for Bioterrorism in the Division of Bacterial and Microtic Diseases at the CDC's National Center for Infectious Diseases, on behalf of CDC and the Agency for Toxic Substances and Disease Registry.

I'm pleased to describe our role in anthrax detection and remediation in the fall of 2001, and particularly CDC's work at the Wallingford Connecticut postal facility.

I would note although both Dr. Perkins and I have knowledge and expertise in the subject of this hearing, we were not specifically assigned to the Wallingford investigation.

An important part of CDC's role during the anthrax attacks of 2001 was an environmental testing of facilities potentially contaminated with anthrax. We performed this work at the request of the State or local health Department. CDC's sample collection experts and microbiological analysis experts worked in consultation with experts from the military and elsewhere.

Environmental sampling was useful in several ways. It helped to identify the likely source of the infection. It helped us to understand environmental exposure pathways and the potential for subtle anthrax spores to become airborne again, and it helped guide decisions about cleaning and reoccupancy.

Before the anthrax events of the fall of 2001, standard procedures for environmental sampling for Bacillus anthracis did not exist. At the beginning, we identified existing sampling methods that could be used or adapted, such as the allergy swab method used for sampling allergen exposures. This became a new sampling technique known has HEPA vacuum sampling, which proved a useful tool to sample for anthrax exposures over large surface areas and complex machine surfaces.

As our investigation proceeded, we continually refined and improved our methods and procedures based on our accumulating experience. Once our primary mission response was complete, CDC worked in partnership with U.S. Postal Service and USPS contractors at various affected postal facility sites to conduct comparative studies to evaluate the strengths and the limitations of various sample collection and analysis techniques.

CDC does not yet know the minimum concentration of anthrax spores that can be detected through existing methods. In an effort to further improve our sampling and analytical ability, CDC has research under way with the Army's Dugway Proving Grounds to clarify sensitivity and analytical methods for Bacillus anthracis and other biological agents.

In interpreting the results of environmental sampling, there are many factors that need to be taken into account. One factor is the purpose of the sampling, whether, for instance, it is for screening,

for targeting, characterization or verification. Another consideration is that different sampling methods, whether swabs wipes or HEPA vacuum, may be best for different types of application, and a combination of these methods is often needed.

The first samples collected in the anthrax investigation were only determined to be positive or negative. Later it became possible to roughly quantify results, but such findings still had limitations in their accuracy. Finally, although the level of anthrax spores in the air is the finding most relevant to risk, it is very difficult to find positive air samples once a facility is closed and ventilation has been turned off. Therefore, surface sampling was most heavily relied upon during the anthrax investigation.

Two patterns of sampling results were the most indicative of possible aerosolization, contamination of surfaces such as air ducts and rafters and the dispersion pattern of multiple positive samples. At the same time it is important to note that surface sampling points to evidence of contamination, but not necessarily evidence of exposure or risk. Engineering information or work practice information are both important in understanding the potential for human exposure, whether, for instance, a particular machine surface has likely potential for worker contact and whether compressed air is used for cleaning.

After inhalation was diagnosed in the 94-year-old woman from Oxford, CT, the CDC deployed an investigative team at the request of the Connecticut Department of Health. The investigation focused on mail as the source of the anthrax, and efforts were undertaken to detect Bacillus anthracis at the Wallingford postal facility.

On November 25, 2001, CDC investigators collected environmental samples at the Wallingford facility using wet swabs, and all samples which were analyzed by the Connecticut Department of Health were found negative. Two earlier rounds of dry swab sampling conducted by the USPS had also found negative results. Although those early results were negative, postexposure prophylaxis was recommended for Wallingford employees, and over 9,000 of the 1,122 workers were given antibiotics.

On November 28, CDC conducted targeted sampling, including the use of wet wipe and HEPA vacuum sampling on a machine used primarily to process bulk mail because 80 percent of the mail received at the patient's home was bulk mail. Positive Bacillus anthracis cultures were confirmed from four bar code sorting machines on this fourth round of sampling, and the affected machines were taken out of service.

A fifth round of sampling was done on December 2, also by CDC, to examine the extent of contamination on the machines, and the results confirmed extensive contamination for machine No. 10.

As a result, these sampling two rounds were finalized by the laboratory, they were reported directly to the Connecticut Department of Health and shared with CDC and USPS so that public health steps, isolation of the affected equipment, town hall meetings and extension of antibiotic treatment for workers to 60 days could be immediately taken. The actions to protect the workers were the same regardless of whether the reporting results were qualitative or quantitative.

Following the assessment component of the investigation, CDC provided technical assistance to the USPS on appropriate methods for decontaminating the machines and verifying the efficacy of cleanup. All samples were found to be negative, and the machines were returned to service. Similar assistance was provided in April 2002 when positive results were found in the high bay areas of the facility.

The CDC investigation was instrumental in demonstrating a possible source for the infection in the case of inhalational anthrax in Connecticut. Our investigation showed that extensive sampling was needed and epidemiological investigation essential in identifying sites for sampling. None of the dry or wet swabs was positive, but positive results were obtained through wet wipes and HEPA vacuuming. Therefore, for future investigation of large facilities, we recommend that these two methods be included.

As mentioned, CDC has research under way with the Army to clarify the sensitivity of sampling and analysis methods for Bacillus anthracis, as well as for other biological agents. As we update our guidelines for anthrax response in the event that future investigations are needed, we will consider the lessons learned from Wallingford and the findings of our continuing research to assure that the most effective sampling is conducted and that the findings and interpretations of findings are properly communicated to all infected parties.

Thank you for this opportunity to testify, and I would be pleased to answer any questions.

Mr. SHAYS. Thank you, Captain Martinez.

[The prepared statement of Captain Martinez follows:]

Testimony
Before the Committee on Government Reform
Sub-Committee on National Security,
Emerging Threats, and International Relations
United States House of Representatives

CDC and ATSDR Activities at the Southern Connecticut Processing and Distribution Center in Wallingford, CT

Statement of
Capt. Kenneth F. Martinez, MSEE, CIH
Supervisory Industrial Hygienist
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
Department of Health and Human Services

For Release on Delivery
Expected at 1:00 pm
on May 19, 2003

Good afternoon, Chairman Shays and members of the Subcommittee. My name is Kenneth Martinez, and I am Supervisory Industrial Hygienist with the National Institute for Occupational Safety and Health (NIOSH) within the Centers for Disease Control and Prevention (CDC). I am testifying today as a CDC expert on environmental sampling so we can be as responsive as possible to the technical nature of the issues at hand. Accompanying me here today is Dr. Bradley Perkins with CDC's National Center for Infectious Diseases (NCID). On behalf of the CDC and the Agency for Toxic Substances and Disease Registry (ATSDR), I am pleased to provide this testimony describing our role in the collection, analysis, and interpretation of environmental samples for biological agents, and to describe our work with the United States Postal Service (USPS) during the bio-terrorism attacks of 2001. As requested, I will review CDC and ATSDR's activities at the Southern Connecticut Processing and Distribution Center (P&DC) in Wallingford, Connecticut. I also will describe some lessons learned and report on relevant ongoing research.

As you know, CDC and ATSDR are part of the Department of Health and Human Services (DHHS). As the nation's disease prevention and control agency, CDC's responsibility is to provide national leadership in the public health and medical communities in a concerted effort to detect, diagnose, respond to, and prevent illnesses, including those that occur as a result of a deliberate release of biological agents. This task is an integral part of CDC's and ATSDR's overall missions to monitor and protect the health of the U.S. population by preventing and controlling disease, injury, and disability.

Background

During the anthrax attacks of 2001, CDC assumed a wide range of responsibilities

including surveillance to detect new cases of illness; epidemiologic investigations to assess the risks of infection; collection of environmental samples to determine the extent of contamination in affected buildings, homes, and vehicles; analysis of environmental and clinical laboratory specimens; delivery of stockpiled antibiotics and vaccine; follow-up of persons receiving stockpile items; and communication with the public and with public health professionals to provide up-to-date guidance and recommendations. In all cases, our participation in these events came at the request of the governing state or local health department.

Environmental Assessments

One important component of the CDC/ATSDR response was the environmental testing of facilities potentially contaminated as a result of the anthrax attacks. This included surface, bulk (testing a powder, dust, or article such as a carpet piece), and air sampling. This testing effort involved the work of sample collection experts at CDC's NIOSH and microbiological analysis experts at CDC's NCID, along with consultation with military and other experts. Based on the best available information and ongoing experience, CDC/ATSDR issued and subsequently updated recommendations for conducting environmental sampling and how laboratories should analyze those samples to identify contaminated areas, characterize the distribution and spread of contaminants, and guide cleanup. Existing programs such as the Laboratory Response Network for Bioterrorism (LRN), which links state and local public health laboratories with advanced capacity laboratories, were strengthened in the enormous effort to enlist resources to identify potential contamination. During the anthrax attacks, LRN laboratories tested more than 125,000 environmental specimens alone, which represented over 1 million individual laboratory tests.

Environmental sampling was extremely useful during the anthrax attacks. Sampling helped us to identify the likely source of infection, understand environmental exposure pathways and the potential for reaerosolization, and guide cleanup and reoccupancy decisions. Standard procedures for environmental sampling for *Bacillus anthracis* did not exist prior to these attacks. However, we made efforts at the outset to identify existing methods that could be used for environmental sampling and to understand any limitations of those methods. Throughout the course of the investigations, it was necessary to continually refine and improve our methods and procedures based on accumulating experience. We recognize that the most reliable sampling methods are those that have been subjected to quality control testing to examine their accuracy, consistency, and factors influencing results, and to establish the lowest limit of detection. Limited information was available on the accuracy and consistency of the existing swab or wipe methods used for surface sampling or for air sampling methods. No information was available on the lowest limit of detection for the various methods. At the outset of the anthrax attacks, CDC scientists adapted methods used for evaluating allergen exposures such as mold or dust mites to create a new sampling tool known as HEPA (High Efficiency Particulate Air) vacuum sampling. This method uses a vacuum to extract spores from the surface into a filter sock which can be analyzed further. It proved to be a useful tool for sampling over large surface areas or for complex machine surfaces.

Where possible, CDC conducted comparative studies using different methods to evaluate the strengths and limitations of various sample collection techniques. These studies were done in partnership with the USPS and their contractors once the primary response mission was complete. For example, CDC conducted "side-by-side" sampling at the Brentwood (now Curseen/Morris) postal facility to compare the effectiveness of

different surface sampling methods for detecting anthrax spores. This applied research also examined the performance of Polymerase Chain Reaction (PCR) technology in comparison with culture approaches (PCR is a technique that amplifies DNA and compares sequences to known test probe standards for *Bacillus anthracis*. Positive findings must be cultured for confirmation.) At the Trenton postal facility, CDC performed "side by side" testing to evaluate the sensitivity of different air sampling methods. The results from these evaluations were shared with USPS, the Environmental Protection Agency (EPA), and other investigators to improve overall assessment ability. CDC also provided advice and recommendations to investigators from other organizations regarding sampling methodology, strategies, laboratory analysis, and data interpretation to maximize interagency testing consistency.

We do not yet have information on the limit of detection (i.e., the minimum concentration of anthrax spores that can be detected) for our methods, but we are partnering with the U.S. Army Dugway Proving Grounds to accomplish this objective. We have always included a discussion of limitations in our guidance on environmental sampling.

Interpretation of Results

Care must be taken in interpretation of environmental sampling results. A number of factors must be taken into account, as described briefly below.

Types of sampling

Not all environmental sampling is performed the same way. The scientific objectives of the sampling (what questions it is designed to answer) will determine how and where sampling is done, and what information the results provide. For example, much of the

initial response sampling performed by CDC and USPS was "screening" sampling, structured to examine whether contamination was present. It was often done with minimal information about the likely location of contamination and was designed to sample across a number of possible locations to increase chances of finding contamination. "Targeted" sampling, where information (such as postal codes, information from interviews with workers) identified suspect locations, was also an important type of sampling. "Epidemiologic" sampling was done in close coordination with CDC epidemiologists looking for possible clues for how patients with anthrax may have been exposed. "Characterization" sampling is performed once a positive location has been identified. It involves sampling in concentric circles around and above positive locations to understand more about the possible migration of contamination via foot traffic or aerosol formation. This information can be used for understanding the types of exposures that might have occurred and to begin planning cleanup strategies. "Verification" sampling is done after a contaminated location has been cleaned up. It involves re-sampling the original surface to ensure that no spores can be detected. It can also involve the use of fans to stir up any settled spores so that they can be detected during air sampling. This is called "aggressive" air sampling. These different types of sampling have all been used at different times at the Wallingford PD&C and other facilities.

Comparisons across methods

Each of the available sampling methods has specific advantages in particular applications, and it is often necessary to use a combination of methods. For example, swabs are very useful for crevices and small surfaces such as keyboards. Wipes are preferable for surfaces with light dust loadings, whereas HEPA vacuum samples are better for heavy dust loadings or complex machine surfaces. HEPA vacuum samples

also provide an important tool for maximizing the surface that can be tested during an investigation. Selection of methods must be made in consultation with laboratory personnel to determine the capabilities and analytical process of the laboratories involved. In some cases, the capability of the laboratory dictated the use of a specific sample collection technique. For example, fewer labs had the capabilities needed to analyze HEPA vacuum samples. Whatever methods are selected, it is important to note that because different methods have different efficiencies and uses, it is inappropriate to directly compare the results from different methods.

Limitations in quantifying results

The first samples collected for *Bacillus anthracis* spores during the anthrax investigations were qualitative in that the results were listed as either positive or negative. Over time, efforts were made to report estimates of the numbers of colony forming units (CFUs) reported for positive samples. However, CDC has always viewed these estimates as "semi-quantitative" in nature since the different methods have their own limitations in accuracy. Findings with higher orders of magnitude (10,000 vs 10 CFUs) can be useful to point investigators toward potential contamination sources.

Air vs. surface results

Because inhalation anthrax is more deadly than cutaneous anthrax, the level of *Bacillus anthracis* spores in air is most relevant to potential risk. However, even though spores are small and can stay suspended for extended periods, it has been our experience that sampling several days after ventilation has been turned off and the facility closed reduces the likelihood of finding spores in the air. In addition, finding a positive air sample does not allow you to identify the source of the contamination. There were no positive air sample results obtained during the outbreak investigations. However,

positive results were obtained in research sampling where conditions were re-created (machines turned on, etc.) to examine the types of exposures that could have occurred.

Investigators during the anthrax investigations relied more heavily on surface samples. While surface samples help to identify the location of contamination, they do not provide results that are directly translatable to risk. Surface levels suggest that a given location is a potential reservoir of spores which, if disturbed, could create aerosols and result in inhalation exposures. We know from research done in the Hart Senate office building that spores can become airborne very easily. In addition, two patterns of surface sampling results are particularly useful as evidence of possible aerosolization: one is contamination of surfaces such as air ducts and rafters, which would be unlikely to have contact with a contaminated source; the other is the dispersion pattern of multiple positive samples. Each of these suggests the likelihood of aerosolization.

Environmental Results and Risk

It is important to point out that surface samples provide evidence of *contamination*, which is different from evidence of *exposure* or *risk*. We are unable to directly link such environmental testing results to risk. First, additional engineering and work practice information is important in understanding the potential for exposure. For example, a surface on top of a machine has less potential for worker contact than a machine console surface. Engineering information such as the use of compressed air for cleaning is an important factor which contributes to exposure potential.

In summary, there are numerous variables which can affect the potential for aerosol formation. Even in the unlikely event that air sampling could be performed during an

attack, or reconstructed afterward, it would be difficult to precisely estimate the risks involved. Because there are no science-based exposure limits for *Bacillus anthracis*, CDC uses a variety of information sources, including environmental sampling, epidemiology findings, and work practice and engineering information, when looking at risks at affected facilities.

CDC/ATSDR Environmental Assessment Activities at the Wallingford P&DC

On November 19, 2001, inhalational anthrax was diagnosed in a 94-year old woman from Oxford, Connecticut. On November 20, at the request of the Connecticut Department of Public Health (CT DPH), a CDC/ATSDR team was deployed to Connecticut. CDC/ATSDR, USPS, and CT DPH began holding conference calls twice a day to coordinate activities, ensure effective communication, discuss findings, and determine appropriate follow-up activities.

The investigation focused on mail as the source of the anthrax, and efforts to detect *Bacillus anthracis* at the Wallingford P&DC, the postal facility that serves the region, were initiated. Prior to the Connecticut anthrax case, independent contractors working for the USPS tested postal processing and distribution plants nationwide to determine if any had become contaminated with *Bacillus anthracis* following the bioterrorism events. As part of this screening effort, the Wallingford P&DC was tested on November 11, by the USPS contractor. Fifty-three samples were randomly collected with dry synthetic swabs, including one from a delivery bar code sorter (DBCS); the samples were analyzed at the CT DPH laboratory and all results were negative for *Bacillus anthracis* contamination. After the report of the 94-year-old woman with anthrax in Connecticut, a second independent contractor hired by USPS collected an additional 64 dry swab samples from surfaces where letters, flats, and parcels were processed. These

samples, along with others collected from air circulating units, were analyzed by the CT DPH Laboratory; all results were negative. Although initial environmental testing at the facility yielded negative results, post-exposure prophylaxis (PEP) with antibiotics was recommended as a precautionary measure for postal workers in the Wallingford P&DC, and the first of several PEP clinics and "town hall meetings" were held. Over 900 of 1,122 postal workers were given antibiotics. CDC and CT DPH epidemiologists reviewed postal worker absenteeism records, hospital visits, and surveillance information for influenza-like illness and cutaneous conditions to evaluate the possibility of other cases among postal workers. Additionally, 472 nasal swabs from Wallingford postal workers were collected and analyzed at the CT DPH laboratory; all nasal swabs were negative for *Bacillus anthracis*.

On November 25, CDC/ATSDR investigators collected their first samples at the Wallingford PD&C (note that this was the third round of sampling at Wallingford). Sixty samples were collected with wet synthetic swabs and processed from the letter canceling and sorting machines, flat and parcel sorting machines, and five facility vacuum cleaner filters. The samples were analyzed by the CT DPH laboratory; all samples were negative for *Bacillus anthracis*.

On November 28, targeted sampling was performed, using epidemiology and postal code information to help guide the sampling. This fourth sampling round extensively sampled DBCS machines including those likely to have processed stamped and bulk mail delivered to the patient's address. For example, because 80% of the mail from the patient's home was bulk mail, sampling was performed for the first time on DBCS machine #10, which is used primarily (75%) to process bulk mail; a HEPA vacuum sample obtained from the feeder portion of this machine identified an elevated reading.

Two hundred twelve samples were collected from the canceling and sorting machines using wet synthetic 2x2-inch wipes (102 samples) and HEPA vacuum (110 samples). Wet wipes were used for sampling hard surfaces such as stacker bins, and the HEPA vacuum was used to sample other portions of the machine, including inaccessible areas. The samples were collected and transported according to CDC recommended methods and were cultured and analyzed at a CDC contract laboratory. On December 2, positive *Bacillus anthracis* cultures were confirmed from four DBCS machines sampled during the fourth round and the machines were taken out of service; no quantitative results were known at that time.

On December 2, characterization sampling was performed in response to these results to examine the extent of contamination found on the four DBCS machines where positive results had been found. For this fifth round of sampling, the four machines were isolated and enclosed using plastic barriers and negative pressure ventilation. Two hundred wipe samples were collected on the sorting bin positions of the four machines. These results confirmed the high contamination of DBCS machine # 10, and provided additional epidemiology findings for machine #6. Machine #6 was used for final mail sorting for several zip codes, including the town where the patient lived. The only column of sorting bins that was found positive included the bins for the carrier route for the patient's home.

The findings from these two sampling rounds were considered as soon as they became available. PEP recommendations were revised and the duration of treatment extended to 60 days. Antibiotics were subsequently distributed to postal workers to provide enough doses to complete a 60 day course. On December 3, a representative from the CT DPH and the CDC team leader met with union officials and management to discuss

the results. A "town hall" meeting was conducted with employees at the Wallingford P&DC. On December 6, additional information regarding the samples collected on November 28 was received, and the laboratory quantified the HEPA vacuum results by providing the estimated number of spores per gram of material. These quantitative results, including the 5.5×10^6 CFU of *Bacillus anthracis* per gram of sample material collected from DBCS machine #10, were discussed on conference calls whose participants included CDC, CT DPH, and USPS. On December 7, preliminary results from the samples collected on December 2 from DBCS machines were reported; although the final number of positives was not confirmed at that time, a total of 30/52 columns of bins from DBCS machine #10 were positive. On or about December 8, a representative from the CT DPH explained the findings of the December 2 sampling to management and union officials.

The contract lab that processed the samples reported the results directly to the CT DPH. The sampling that identified the contamination and produced these results was designed and implemented to assure maximum sensitivity for detecting spores from machine surfaces. Similar measurements (greater than 1 million CFUs/gr) at the Brentwood postal facility had previously been reported to USPS. These findings indicated that the feeder section of the machine was the most contaminated location in the facility, but did not support direct interpretations on exposure or risk. The actions taken to protect workers in response to the findings would have been the same whether the reported results were qualitative (e.g. "positive") or quantitative. Upon receipt of these results, CDC communicated and discussed them via telephone conference call with multiple parties, including USPS representatives, and appropriate public health actions were immediately taken, including shutting down and isolating the machine (and all areas identified as contaminated) and performing appropriate follow-up activities

(e.g., additional characterization sampling and offering of antibiotic prophylaxis to potentially exposed workers).

Environmental Sampling and Remediation

Following the assessment component of the investigation, CDC/ATSDR provided technical assistance to the USPS in determining the most appropriate methods for decontaminating the machines. CDC/ATSDR personnel provided input into the scope of work and were present on site to provide technical guidance during the decontamination of the machines and subsequent environmental sampling to verify the efficacy of the decontamination. At the Wallingford P&DC, an additional level of environmental monitoring was conducted to ensure the machines were adequately cleaned. This entailed conducting "aggressive" air monitoring (within the enclosures surrounding DBCS #10) after the machine had been cleaned and all subsequent wipe samples were found to be negative. Aggressive air sampling entails using compressed air to "blow down" the machine in an attempt to dislodge any spores that may be present so that they could be detected by air samplers within the enclosure. Additionally, surface samples were collected from ventilation grilles and other surfaces. The criterion used for determining if the cleaning was effective was zero growth. The results of this testing, analyzed by the CT DPH were reported on December 20, 2001. No *Bacillus anthracis* was detected, and the machines were put back into service.

In April 2002, additional testing of the Wallingford P&DC was conducted by the USPS to determine if *Bacillus anthracis* might be present in the "high bay" areas of the facility above the previously contaminated DBCS machines. This sampling found that 3 out of 71 sample locations tested positive for *Bacillus anthracis* . The CDC was notified of these results and participated in a subsequent working group comprised of

representatives from CT DPH, USPS, postal unions, EPA, and the Occupational Safety and Health Administration. CDC provided advice and on-site technical assistance regarding additional sampling activities, remediation strategies, employee communication, and post-remediation sampling.

Summary/Lessons Learned

The environmental investigation was central in demonstrating a possible source of infection for the case of inhalational anthrax in Connecticut. Our investigation showed that extensive sampling was required and that epidemiologic investigation was essential in identifying sites for sampling. None of the dry or wet swab samples was positive; however, positive samples were obtained from wet wipes and HEPA vacuums. Therefore, for future investigations of large facilities, we recommend that wet wipe and HEPA vacuum sampling be included.

As mentioned, CDC has research underway with the Army's Dugway Proving Grounds to clarify the sensitivity of the sampling and analytical methods for *Bacillus anthracis.* In addition, CDC is currently updating its "Interim Anthrax Response Plans and Guidelines" originally published on November 9, 2001. These guidelines provide decision logic and directions for interventions for anthrax response should future investigations be needed. CDC will be taking a close look at issues related to communication, sampling, and interpretation of results.

Thank you for this opportunity to testify. I would be pleased to answer any questions.

Mr. SHAYS. We'll now go to Dr. Hadler.

Dr. HADLER. I should speak into the silver mic; is that correct?

Mr. SHAYS. Yes, that's right.

Dr. HADLER. Good afternoon, Mr. Chairman and members of the subcommittee. Thank you for the opportunity to describe the investigation of the inhalation anthrax case in Connecticut, the subsequent identification of anthrax in the Wallingford postal facility, and lessons learned as they relate to sampling.

I have been director of the infectious diseases division and State epidemiologist at the Connecticut Department of Public Health for the past 19 years. I'm a physician trained in internal medicine and infectious disease and public health.

Mr. SHAYS. You need to talk a little louder, and you don't have to face us. You can face forward, which your voice will carry the mic.

Dr. HADLER. OK.

Mr. SHAYS. Thank you.

Dr. HADLER. I was the lead Connecticut investigator sharing responsibility of the overall investigation with several colleagues that the CDC assigned, one onsite and one in Atlanta. The investigation unit included staff from the CDC, Department of Public Health, several local health departments, and liaison staff from the FBI and USPS Connecticut.

As co-lead investigator with the CDC team leaders, I directed the meetings of the investigation unit, provided support staff for the investigation, communicated important information to the Commission of Public Health and Governor——

Mr. SHAYS. A little louder, please.

Dr. HADLER [continuing]. And met with Connecticut-based U.S. Postal Service officials at their request to interpret findings from the investigation and explain the rationale for public health recommendations relating to them.

In considering what we learned in Connecticut about sampling a postal facility for contamination with anthrax spores, it's important to know the context in which sampling was done and which results were interpreted.

We began our investigation only knowing that an elderly woman located far off the beaten track in Connecticut had developed anthrax more than a month after the last known intentionally contaminated letters had been mailed. Our main objective was to determine how she had been exposed and to assure that anyone who might have been coexposed was quickly identified and given an opportunity to take antibiotic preventive treatment. The Wallingford postal distribution facility was only one of a number of sites where we investigated to determine whether anyone else had developed anthrax and where environmental sampling for anthrax spores took place.

We quickly established several important points, but turned our attention to the Wallingford postal facility. Our case had a very limited lifestyle that made it most likely she was exposed to anthrax in her home. She had not received any suspicious mail such as that addressed to Senators Daschle and Leahy.

Despite repeated and progressively more aggressive sampling, we could not find spores in her home. Her strain of anthrax, however,

was the same as that in the other bioterrorism-associated cases of anthrax.

Finally, although unrelated to her exposure, we found a letter in Connecticut that had been cross-contaminated with anthrax while passing through the Trenton, NJ, postal distribution center and which still had spores adhering to it when found in the home to which it was mailed. This confirmed that one could be exposed to cross-contaminated mail in the home. Thus, our leading hypothesis to explain all these findings became that she was exposed from a low dose of anthrax that was released into her breathing space from cross-contaminated mail when she opened it or disposed of it at home.

To support this hypothesis, we needed to find evidence that cross-contaminated mail had passed through the Wallingford postal distribution facility. Our efforts became increasingly more focused on mail-sorting machines and on thoroughly sampling all 13 of them, not just the one that did the final sort of mail for her postal route.

We had no other reason to continue testing. We had found no case of anthrax in postal workers in Wallingford. None of the nasal swabs we took were positive from all 500 postal works, and all of the 177 samples taken during 3 initial rounds of sampling had been negative. This is in stark contrast to Brentwood and Trenton, NJ, where about 40 to 50 percent of initial specimens were found to be positive.

Ultimately after taking an average of 10 samples from each of 13 mail-sorting machines, we found spores on 4 of them. Further testing of these machines showed that one of them was heavily contaminated by two standards. First, nearly 70 percent of all samples taken from it were positive. None of the other contaminated machines had more than 6 percent of samples positive.

Second, an estimated 3 million spores were found in 1 vacuum sample. No other positive sample had more than 370 spores in it. From an investigative perspective, these findings suggested that the Connecticut case of anthrax had been exposed via cross-contaminated mail, mail that had been contaminated by the heavily contaminated machine as it passed through it.

From a risk perspective, we interpreted the positive findings as described in detail in the written testimony. The real issue is that one mail sorting machine was still heavily contaminated with anthrax approximately 6 weeks after it was likely originally contaminated, but did this mean that there had been an ongoing risk of exposure to employees? We thought not.

We knew that the risk of inhalation anthrax would have been greatest when spores initially entered the postal facility and when they might have been airborne in the form of a plume. We also knew that no one had developed anthrax despite a month passing from the time spores were introduced to when antibiotics were offered. In addition, there was no evidence that there had been widespread contamination based on the initial broad-based sampling efforts in the facility. Further, we knew that many other postal facilities nationwide likely had a similar level of contamination.

Mr. SHAYS. Can you hold—suspend for just a second? I'm going to ask you to just talk a little louder. The mics for some reason are

not as loud as they have been in the past. So it's pretty—the black one is C–SPAN, so it's not going the amplify it. It's the silver one.

Dr. HADLER. Is this one on?

Mr. SHAYS. It's on, but it's not loud.

Dr. HADLER. OK. Just to continue, further, we knew that many other postal facilities nationwide likely had a similar level of contamination that was unrecognized, and that no one working in these other postal facilities had developed inhalation anthrax. From a theoretical perspective, no matter how many spores were found, as long as they were not airborne, they did not pose an immediate risk to anyone.

Finally, the Wallingford facility had not used cleaning procedures that might aerosolize fatal spores for more than a month; thus, we felt that there was no added risk to workers from finding high quantitative levels of spores on one machine compared to finding any spores.

Thus, the advice given to the U.S. Postal Service was that the only public health actions necessary to protect worker physical health were, first, to continue antibiotics on all workers for a full 60 days with an emphasis on those who worked around the contaminated mail-sorting machines; second, to immediately stop using the machines that tested positive for anthrax and disinfect them; and three, to continue with cleaning methods elsewhere in the facility that would not aerosolize spores that might still be present that had not been picked up by sampling.

But before completing my testimony, I'd like to go over what I think are the main lessons to be learned from our experience as they relate to sampling. There are four of them.

First, it's possible to have substantial localized cross-contamination of a postal facility with no human cases of anthrax. The Wallingford postal facility was probably the most thoroughly studied postal distribution center where there were no human cases of anthrax. In the future, if something like this were to happen again, I think we need to ask ourselves if there are no human cases occurring in the first 1 to 2 weeks after an attack, is it necessary, or at least how necessary is it, to be concerned about additional cases occurring without additional mailings? We can never fully guarantee that there are no anthrax spores present in a postal facility, so we also have to use our human observational information in addition to the environmental sampling information to put things in perspective.

Second lesson: In any sampling initiative the objectives of sampling need to be clear and the methods tied to them. If the objective of sampling is to find any spores, if they're there, as it was in Wallingford, it's critical to use sensitive collection methods, to sample where the spores are most likely to be and to take enough samples. On this note, I think as others have noted, the initial methods used to sample postal distribution centers around the country were very insensitive with respect to finding any contamination. They were really only potentially useful to determine if a leaky letter packed with spores had gone through them.

Third lesson: If we were to get another mailing like the one in 2001, we need to understand that the risk to postal workers will be highest initially and rapidly diminished even without preventive

treatment with antibiotics. It also appears that the main threat once spores settle will be from reaerosolization. Ideally, to prevent reaerosolization, we need to continue to avoid using compressed air to blow dust out of machines, and we need to continue to avoid using vacuums that are not equipped with HEPA filters.

Finally, in my opinion, if we want to proactively monitor postal facilities for the introduction of an anthrax-containing letter, we need to realistically define our objectives and methods. In my opinion, it may only be feasible to do crude monitoring of air around sorting machines to try to pick up letters like the Daschle and Leahy one. Actually, not surface samples; we're interested in picking them up while they're still a risk, while the spores are in the air. With luck, we might find spores a day or two before the first postal worker develops anthrax if there are enough spores to potentially expose postal workers to anthrax.

This concludes my oral testimony. Thank you again for the opportunity.

[The prepared statement of Dr. Hadler follows:]

Testimony to Subcommittee on National Security, Emerging Threats, International Relations

Stamping out anthrax in USPS facilities: technologies and protocols for bioagent detection

James L. Hadler, MD, MPH
Director, Division of Infectious Diseases and State Epidemiologist
Connecticut Department of Public Health
May 19, 2003

The following is my testimony to the Congressional Committee on Government Reform, Subcommittee on National Security, Emerging Threats and International Relations, Chaired by Representative Christopher Shays of Connecticut. This testimony is in response to the invitation dated May 7, 2003 from Representative Shays.

Thank you for the opportunity to describe the investigation of the inhalation anthrax case in Connecticut, the subsequent identification of anthrax in the Wallingford postal facility and the response to it, and the lessons we learned in the process that may help focus our response in the future.

Introduction

I have been the Director of the Infectious Diseases Division and State Epidemiologist at the Connecticut Department of Public Health (DPH) for the past 19 years. As the director, I oversee the state's infectious disease surveillance and control programs. Among other responsibilities, this includes investigation of outbreaks of infectious disease and illness, both those that are naturally occurring and those that may be related to bioterrorism. As State Epidemiologist, I am the designated contact person for infectious disease issues in Connecticut with the national Centers for Disease Control and Prevention. I am a physician, trained in internal medicine, infectious diseases, public health and epidemiology. My job is an established civil service job, open to competitive examination. I am not appointed.

When the case of inhalation anthrax in an elderly woman was reported to my Division in November 2001, I relayed the information to Dr. Joxel Garcia, Commissioner of DPH. Within several hours, Dr. Garcia invited the Centers for Disease Control to assist in the investigation. I was assigned by Dr. Garcia to be the DPH Lead Investigator on the joint DPH-Centers for Disease Control (CDC) investigation unit that was rapidly formed and responsible for conducting the onsite epidemiological investigation and response. As co-lead investigator with the CDC team leader, I directed the twice-daily meetings of the investigation unit, provided support staff from DPH for the investigation, communicated important information to the Commissioner of Public Health and Governor and met with Connecticut-based USPS officials at their request to interpret findings from the investigation and explain the rationale for public health recommendations relating to them.

I have been asked to testify on the role of the Connecticut Department of Public Health with regard to sampling, testing and interpretation of test results at the Wallingford, Connecticut USPS postal facility; discussion with the Centers for Disease Control and Prevention with regard to sampling, testing and interpretation of test results; and lessons learned from the investigation, detection and remediation efforts at the facility.

My written testimony covers four areas: 1) the context of the postal component of the investigation - what we knew about the anthrax mail attacks and their health consequences when the investigation began; 2) the role of the Connecticut DPH in the investigation and remediation efforts at the postal facility where anthrax spores were found; 3) how sampling efforts evolved during the investigation and remediation and what advice was given to the USPS regarding sampling and interpretation of test results; and 4) lessons we learned in the process that may help focus our response in the future.

Importantly in the context of discussing postal facilities, the main focus of the investigation at all times was to determine how the Connecticut victim was exposed to anthrax and to assure that anyone who may have been co-exposed was quickly identified and given an opportunity to take antibiotic preventive treatment. The Wallingford postal distribution facility was only one of many sites where the investigation to determine if anyone else had developed anthrax and where environmental sampling for anthrax spores took place. Although the investigation identified anthrax on 4 mail sorting machines in the Wallingford postal facility, no postal worker in Connecticut developed anthrax. A description of the full investigation is being published in the June 2003 issue of the journal *Emerging Infectious Diseases*. It is currently available on line at the CDC website (1).

Context of the Postal Investigation

When the investigation of a case of inhalation anthrax in an elderly woman began in Connecticut on November 20, 2001, a considerable amount of relevant information from the investigation of the mailing of letters containing anthrax to selected news media and to Senators Daschle and Leahy was already known. Salient points included:

- **The last known introduction of anthrax-containing letters into postal facilities was between October 9-12** when the Daschle-Leahy letters entered and passed through the postal distribution system. The last dates from which potentially cross-contaminated mail could have come into Connecticut from the Trenton, New Jersey and Brentwood, D.C. postal distribution facilities through which these letters passed was approximately October 22. The Trenton facility was closed on October 18, the Brentwood facility on October 21.

- **All postal workers with inhalation anthrax were in postal facilities through which the letters passed**; those affected were in the direct vicinity of the letters when they passed through mail sorting machines, physically handled mail or were present after machines were blown out with compressed air. All had developed symptoms within a week of *initial* exposure. **No additional cases had occurred for more than 30 days in workers in those facilities, and no cases had occurred in any other**

postal facilities in the US despite evidence that anthrax spores were likely to be present in many facilities nationally.

- **The actual risk of contracting inhalation anthrax in the Trenton and Brentwood facilities peaked quickly and was low overall**: in Trenton, only 2 of 170 (1.2%) mail sorting workers who were exposed and 2 of 750 (0.25%) workers present at or after the time the letters went through developed illness; in Brentwood, the attack rates were 2 of 190 (1%) workers who were present in the two "high risk" areas of the facility where and when the letters went through, and 4 of 610 (0.7%) overall who worked in these two areas then and until the facility closed. There had been time before antibiotics were offered for many others to become ill. **Exposure appeared to result from plumes of spores generated directly in the vicinity of the contaminated letters when they passed through or generated within 24 hours by cleaning contaminated machines with compressed air** (2,3).

- **Anthrax was readily found using dry swabs throughout the Trenton and Brentwood facilities**. More than 40% of initial samples taken were positive.

- **Many postal facilities in the greater D.C. area and throughout New Jersey had tested positive for anthrax**. These facilities had not been closed for cleaning, and no cases of inhalation anthrax had occurred in them.

- **By approximately October 23, 2003, new guidelines for cleaning postal facilities nationwide were issued**. These guidelines outlined cleaning methods that would minimize the potential to aerosolize anthrax spores that might have entered the postal environment through cross-contaminated mail. No cases of inhalation anthrax occurred after those recommendations were made.

- **Wallingford and 3 other CT facilities had been sampled for gross contamination with anthrax spores in the 2 weeks before the Connecticut case investigation began**. A USPS protocol was used for sampling, a contractor obtained specimens using dry swabs, and the specimens were tested in the DPH laboratory. No positives were found in any of the facilities.

- Several weeks earlier, an older New York woman had died of inhalation anthrax of unknown source; no cases of inhalation anthrax occurred in the New York postal workers.

Thus, at the time the investigation began, there was no reason to think that Wallingford postal workers had been or were at ongoing risk for anthrax, unless a new letter containing spores had been mailed and passed through that facility in the 3 days between the earlier environmental sampling and the onset of symptoms in the patient. In addition, **it had already been established that anthrax spores could be in postal facilities without posing a particular risk for inhalation anthrax**. Spores that had been present in the environment for some time were not felt to pose a risk unless they were aerosolized. Measures had been recommended for all postal facilities to eliminate

cleaning procedures (e.g., use of compressed air to blow dust out of mail sorting machines) that could aerosolize spores.

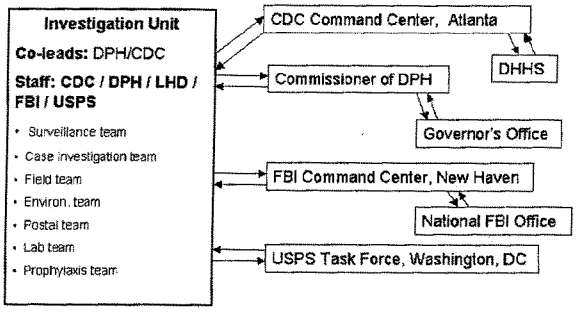
Role of the Connecticut DPH

Investigation and Response.

No single person oversaw the investigation and response to the Connecticut inhalation anthrax case. The DPH teamed with CDC to investigate and respond to situation.

More specifically, the investigation was carried out on site in Connecticut by a multi-agency investigation unit through collaborative matrix management (see organizational chart on the next page). The investigation unit was based in the Connecticut DPH emergency operations center. It consisted of approximately 25 staff from the CDC, 3 staff from DPH, 2 staff from local health departments, 1 liaison person from the New Haven FBI office, and 3 liaison staff from the Connecticut USPS office in Hartford. These assets were divided into teams, each lead by one of the CDC assignees to Connecticut (see chart), which met every morning and evening either in person or by conference call. **The unit was co-lead by three persons: the DPH leader (me), a CDC site leader (Dr. Eric Mast) and a CDC Command Center leader in Atlanta (Dr. David Swerdlow). Between the morning and evening meetings, we each reported to our respective leaders daily (see chart), and they helped make or endorse all major investigative and response decisions.** Dr. Swerdlow and other staff in Atlanta were present on all the daily working meetings. The FBI and USPS liaison staff were present for all daily workgroup meetings and shared information with their respective command centers. Several times, conference calls with the CDC directors, DHHS director and/or the Governor's office were held to discuss key findings and the response to them.

MATRIX OF AGENCIES INVOLVED IN INVESTIGATION OF CASE OF ANTHRAX CONNECTICUT, Nov-Dec 2001



Abbreviations: CDC – Centers for Disease Control; DPH – Connecticut Department of Public Health; LHD – local health departments; FBI – Federal Bureau of Investigation; USPS – US Postal Service, Connecticut

Although all decisions and recommendations regarding finding anthrax spores were group decisions, it was a DPH role to communicate and discuss the recommendations with USPS leaders. Although this was done in part during the working meetings each morning and evening, I was invited at least 3 times during the investigation by the USPS liaison representatives to explain the recommendations to medical and managerial staff from the Wallingford facility. These were: 1) when it was decided at the beginning of the investigation before anthrax spores had been found to offer antibiotics to all Wallingford postal facility workers; 2) in early December when anthrax contamination was initially identified; and 3) a week later when additional results showed that one of the mail sorting machines was heavily contaminated.

Remediation

Remediation of spores once they were identified was generally a separate activity from the investigative ones that focused on determining how the elderly woman with anthrax was infected. Different groups with expertise in remediation took over, and the DPH role in planning and carrying out remediation was more peripheral.

Remediation efforts were necessary in two distinct time periods: first, in response to finding contaminated mail sorting machines during the investigation (December 2001), and second, in response to finding contamination in several "high bay" areas over those machines three months later in safety testing done prior to scheduled cleaning (March-April 2002).

The main remediation team consisted of USPS, the USPS Task Force in Washington, D.C. (including representation from EPA), CDC-NIOSH, and, in April 2002, the USPS contractor for cleaning and remediation In both instances, the DPH laboratory performed testing of samples taken to determine the limits of contamination. I was a nominal member of the remediation team in each case, but, as neither I nor anyone else at DPH had any experience with remediation, DPH did not participate directly in planning remediation. However, as the state public health agency, **DPH helped the remediation team develop recommendations for what precautions needed to be taken to protect USPS workers while the remediation was occurring, in interpreting results and making recommendations for responding to them**. When contamination of the "high bay" area was identified in samples taken by the contractor prior to cleaning, I was asked to explain the public health recommendations developed by the remediation team (including CDC) to workers at the Wallingford facility. In this latter instance, I met with all individuals at the facility, not just managers and supervisors.

Sampling to Detect Anthrax

Changing purpose and methods

The purpose of sampling the Wallingford postal facility and the persons designing the sampling scheme and doing the sampling constantly changed. Sampling was generated by the postal service, by the investigation of a case of anthrax outside the postal service and in anticipation of remediation or cleaning efforts.

During the investigation of the case of anthrax outside the postal facility, the goal of sampling was to find objective evidence in the form of spores to determine where and how the elderly woman with anthrax was exposed. Testing of the postal facility was only one focus of the investigation to see if there was a residual spore trail there to support the hypothesis that she was exposed via the mail. However, the house of the anthrax case was focused on just as intensively, as was her local mail route and every place she had visited during the potential incubation period after exposure.

In this context, **sampling of the Wallingford postal facility for anthrax was conducted a number of times and for changing reasons, based on the results of previous testing both within and outside of the postal facility. The following is an outline of the dates sampling was conducted, the reasons for sampling, the agencies involved in designing the sampling scheme, the results and the conclusions from each round of sampling.** The experience with environmental sampling for anthrax spores is discussed in more detail in an article written by some of the investigators and published in the October 2002 issue of *Emerging Infectious Diseases* (Reference 4, appended at the end of this testimony).

- **November 11, 2001** - prior to any anthrax case in Connecticut; conducted by a USPS contractor using their own protocol and dry swabs to identify whether there was gross contamination of the facility. Although the DPH laboratory was contracted for testing, the sampling protocol was confidential and no input on it was requested from DPH. **Results: All samples were negative.** Conclusion: no evidence of gross, widespread contamination such as might have been found if a letter intentionally packed with anthrax spores had passed through the facility. **Of note, only 1 sample was taken from a mail sorting machine - not the one that was found later to be heavily contaminated.**

- **November 21, 2001** - within 24 hours of confirmation of an anthrax case in Connecticut; conducted by a different USPS contractor using their own protocol and dry swabs to identify whether there was any evidence that contaminated mail had passed through the facility. In particular, sampling focused on surfaces where mail was handled or in the air handling units. DPH was not consulted for sampling design. **Results: All samples were negative.** Conclusion: from this and negative sampling of the patient's house, no evidence that a letter intentionally packed with anthrax spores had passed through Wallingford or been opened in the patient's home. The sampling was felt to be sensitive enough to have detected a letter similar to the ones sent to Washington. However, sampling was not felt to be sensitive enough to rule out the possibility that a letter with fewer spores, such as a cross-contaminated letter had passed through. **Of note, only 6 samples were taken from mail sorting machines - none from the one that later proved to be heavily contaminated.**

- **November 25, 2001** - conducted by CDC using a more focused protocol developed by the investigative team (including DPH) and potentially more sensitive wet swabs to determine whether there was evidence that a contaminated letter or package had

passed through the postal facility - focused on sampling a wide variety of mail processing machines that may have handled mail destined for Oxford, CT. **Results: None were positive. Of note, only 8 samples from mail sorting machines, none from the heavily contaminated one.** Conclusion: did not look hard enough for contamination to rule it out. Need intensive, systematic sampling of all mail sorting machines before give up on trying to see if mail might have been a source of exposure to anthrax.

- **November 28, 2001** - conducted by CDC using a much more focused and intensive protocol developed by CDC Atlanta and investigative team and wet wipes and vacuum samples from each of 13 mail sorting machines. **Purpose was to definitively determine whether there was any residual evidence that a contaminated letter had passed through the Wallingford postal distribution facility.** Results: A total of 130 samples collected, all from mail sorting machines, between 8-13 samples from each. By December 2, preliminary reading of culture plates by the contract laboratory in Texas showed **a total of 7 specimens from 4 different mail sorting machines appeared to be positive for anthrax (4 of 8 samples from the heavily contaminated machine).** Conclusions: **1) if you look hard enough, you can find spores; 2) evidence suggests that one machine, one handling mostly "bulk" mail, may be more heavily contaminated, may be clue to how anthrax case was exposed; 3) spores most likely entered Connecticut in mid-October and had not caused any inhalational disease during the high risk time period in the few days afterwards when spores could have been airborne before settling; 4) contamination found has not posed a continuing risk to workers, as cleaning procedures have been used that do not aerosolize spores and none of nasal swabs from more than 450 workers tested positive;** 5) presence of contamination justifies keeping postal workers on antibiotics for full 60 days - may have been exposed in mid-October; 6) contaminated machines should be taken off line and decontaminated; **7) one more round of intensive sampling of contaminated machines should be done before decontamination to see if one machine is truly more contaminated than the others.**

- **December 2, 2001** - conducted by CDC using focused and intensive protocol to sample four positive machines - 48-52 wet wipe samples from mail sorting boxes taken from each machine. Results: Only 1-3 positive samples from each of 3 of the machines; **30 (>50%) positive from the heavily contaminated machine.** In addition, **one of the earlier vacuum samples from underneath the vibrator section of that same machine came back with an estimate that it had approximately 3 million spores.** Conclusions: **1) one machine much more contaminated than the others - the machine on which contaminated mail likely entered Connecticut;** 2) most likely, source of spores was cross-contaminated bulk mail that entered Connecticut in mid-October and had been there since then; **3) the previous conclusions about risk to workers are unchanged by these findings - the real risk was when the spores were introduced and possibly airborne in the vicinity immediately around the machine, not now;** 4) the positive findings from the one heavily contaminated machine further justifies continuing workers on prophylaxis for

the full 60 days, particularly workers who worked around mail sorting machines; **5) prior to remediation, need to do sampling above the machines to see if evidence that spores had been aerosolized when introduced in October to determine whether additional decontamination is needed; 6) given that the finding of the heavily contaminated machine and the one sample with as many as 3 million spores was a *chance finding* resulting from a determination to be sure there was not a spore trail to explain the inhalational anthrax case, no one can be sure that similarly contaminated machines are not present in many postal facilities nationwide. While spores on the ground do not pose a threat if they remain there, it is important to continue using cleaning methods that will not aerosolize spores.**

- **December 7 (?), 2001** - conducted by CDC/NIOSH using protocol they developed and vacuum and wet wipe sampling around air vents and up to 6 feet directly over the machines to be decontaminated (not "high bay") - for remediation purposes. Results: **No samples were positive, although fewer than 10 were taken, none from the high bay area.** Conclusion: no evidence of aerosolized spores; can just decontaminate the machines.

- **Mid-March 2002** - conducted by a USPS contractor using a protocol they developed in conjunction with CDC-NIOSH and vacuum methods. Purpose was to assess whether evidence of anthrax contamination of "high bay" area prior to cleaning that area. Testing done at DPH laboratory. **Results: 3 of more than 100 samples positive. All three positives were just above the machines that were found to be contaminated in December 2001. Conclusion: 1) contamination was not unexpected - is likely old - present since mid-October 2001; 2) no new prophylaxis needed - have been no cases of anthrax, no aerosol-generating procedures**; 3) areas of known contamination should be safely decontaminated prior to cleaning of the high bay area.

Selection of sampling strategy and methods

Neither the DPH nor CDC were involved in selecting the initial sampling strategy for USPS when they were doing routine testing of many postal distribution facilities nationwide.

The sampling strategy and methods used during the investigation of the case of inhalation anthrax and which ultimately detected anthrax were determined by CDC staff based in Atlanta in consultation with the environmental sampling team from NIOSH/ATSDR that they sent to Connecticut. These persons already had substantial experience from working in Washington, DC, Florida or New Jersey, and used this experience to determine how to approach environmental sampling in Connecticut.

The sampling strategies used by the contractor who tested the high bay area were worked out in conjunction with CDC. By March 2002, there had been substantial experience with different sampling methods. It was realized that vacuum samples were the most sensitive and they were used.

The laboratory testing methods were those worked out and recommended by CDC. **Most of the samples for testing were handled by the DPH laboratory.** Staff at DPH had taken CDC training courses and had passed proficiency testing. **The one exception to the DPH laboratory handling specimens from the postal facility was the November 28 sampling, consisting of vacuum and wet wipe specimens.** Vacuum and wipe specimens take much more time to work with (involve extraction and concentration steps). Because a large number of specimens were collected and because the DPH laboratory was also working with a large number of specimens from repeated sampling of the patient's home, places she visited and the local post office, it would not be able to work with those specimens immediately. Thus, it was decided to send those specimens to a laboratory in Texas with which CDC-NIOSH had a contract. **Unbeknownst to the members of the investigation unit, results from vacuum specimens could be quantitated**. Vacuums pick up a measurable amount of material. Although only about 5-10% of the vacuum sample is tested, the results can be extrapolated to the full sample to obtain an estimate of how many spores were in the sample. Thus, when results from a vacuum specimen were reported as having nearly 6 million spores per gram of material, we were surprised. We had expected only "positive" or "negative". The laboratory was called and testing methods discussed. Given that approximately 0.5 grams of material had been in the sample, we estimated that the sample contained 3 million spores. Our concern then was that, if effectively aerosolized (something not easy to do), this could pose a health risk to the people in the immediate area where aerosolized.

Interpretation of quantitative test results

There are two aspects of quantitation of results from testing of the Wallingford postal facility. First, there is the percentage of samples that were positive. This peaked at 58% for the heavily contaminated mail sorting machine, followed by only a 2-6% range among the other 3 contaminated machines. In addition, the same machine had a single vacuum specimen with approximately 3 million spores. The only other positive quantitative vacuum sample was approximately 270 spores, from a machine with only one specimen (2%) of all specimens from that machine during the intensive retesting effort testing positive.

Quantitative results were interpreted by the investigative team and the persons they reported to (CDC leadership, Connecticut Commissioner) in light of the findings from other investigations and other findings in this one. They indicated that one mail sorting machine was still fairly heavily and consistently contaminated with anthrax, approximately 6 weeks after it was likely contaminated. Given that: 1) the risk of inhalation anthrax would have been greatest when the spores entered the postal facility; 2) no one was begun on prophylaxis for at least a month after the spores likely arrived, yet no one developed anthrax; 3) there was no evidence that there had been widespread contamination based on multiple efforts to sample the facility;
4) many other postal facilities likely had a similar level of contamination that was unrecognized and no one working in these other postal facilities had developed inhalation anthrax; 5) no matter how many spores were found, as long as they were not airborne, they did not pose an immediate risk; 6) the Wallingford facility had not used cleaning

procedures that might aerosolize settled spores for more than a month; there was no added risk to workers from finding high quantitative levels of spores compared to finding any spores. Thus, **the advice given to the USPS was that the only public health actions necessary to protect worker physical health were to: 1) continue antibiotics on all workers, emphasis on those who worked around the contaminated mail sorting machines, for a full 60 days; 2) immediately stop using the machines that tested positive for anthrax and disinfect them; 3) continue with cleaning methods that would not aerosolize spores that might still be present but had not been picked up by sampling.** In addition, it was pointed out that due to the investigation that lead to finding spores in the postal distribution center, workers knew there was contamination in their facility and had a chance to discuss their concerns. **In most other postal facilities, workers did not know that contamination was likely present and might pose a threat if their facility became careless with cleaning methods and reverted to those that could potentially re-aerosolize spores.**

Lessons learned

There are a number of lessons learned from the Wallingford experience that may be helpful to the concept of "stamping out anthrax in USPS facilities".

1. **It is possible to have substantial localized contamination of a postal facility with no human cases of anthrax**. The Wallingford postal facility was probably the most thoroughly studied postal distribution center that had no human cases of anthrax. Based on observations from what happened both before and after contamination was discovered, there appeared to be no real human risk from a mail sorting machine with more than 50% of specimens positive and one quantitative specimen of approximately 3 million spores more than a month after it was likely contaminated. Given this and the overall US experience of no cases of inhalation anthrax in postal workers outside of the direct path of known intentionally contaminated letters, it suggests that **widespread testing of the postal system to identify contamination to clean up may not be necessary**. In the future if something like this were to happen again, we need to ask ourselves: if there are no human cases occurring in the first 1-2 weeks after an attack, it is necessary to be concerned about additional cases occurring without additional mailings? We can never fully guarantee that there are no anthrax spores present in a postal facility. One does not want to create panic if there is no need to - it only plays into the objectives of terrorists.

2. **In any sampling initiative, the objectives of sampling need to be clear and the methods tied to them. If the objective of sampling is to find *any* spores if they are there, it is critical to use sensitive methods** (vacuum and/or wet wipe), to sample where the spores are most likely to be, to take enough samples (at least some from every machine), and to go back and sample again if necessary. **Contamination may be localized**. In Wallingford, the objective of the epidemiological investigation was to find any spores if they were there. Positives were not found until vacuum and wet wipe sampling methods were used and every machine was sampled. This lesson was applied successfully to the high bay sampling, in which many specimens were taken using the vacuum method. Few were positive (<3%), but enough were taken

from the right place to find spores. By contrast, **the initial methods used in postal distribution centers around the country were very insensitive**: general sampling (few mail sorting machines), insensitive sampling method (dry swabs) and few specimens (only 53 total, widely scattered, only one sample from one mail sorting machine). It is not clear what the objectives were of this sampling. However, it would only have picked up very widespread and heavy contamination - not localized and variable levels of contamination. **If the objective of sampling is to find levels of contamination that would pose a threat to postal workers, then we need to decide if any sampling is necessary if no human cases have occurred by the time we decide to sample.** On the other hand, maybe the crude level of sampling done on November 11 was adequate to detect contamination that would have been risky at the time it occurred.

3. **If we were to get another mailing like the one in 2001, we need to understand that the risk to postal workers will be highest initially and rapidly diminish, even without preventive treatment with antibiotics.** We also need to assume that all postal facilities can become contaminated from cross-contaminated mail following mailing of such letters. **It appears that the main threat in any facility once spores settle will be from re-aerosolization.** Although it was shown in studies of the Hart Senate Office building that spores fine enough to be inhaled could be re-aerosolized by routine activities such as walking in the office, observational data from postal facilities demonstrated that no one was infected with anthrax anywhere after the first few days spores were in postal facilities. On the other hand, data from Brentwood suggested that two workers may have been exposed as a result of using compressed air to clean out sorting machines in the 24 hours after initial contamination. Using compressed air is much more likely to aerosolize dust than routine physical activities. Ideally, to minimize the potential for re-aerosolization, we should not go back to the old methods of cleaning machinery with compressed air and vacuums that are not equipped with hepa-filters. One contributing reason to the observation **that there were no cases of inhalation anthrax in Wallingford workers or elsewhere in the country due to cross-contaminated mail may be that guidelines to minimize the potential for aerosolization of settled dust and spores were quickly implemented nationwide.**

4. Given what we learned in Wallingford, **it will be difficult to monitor postal facilities proactively for the introduction of a contaminated letter using surface sampling testing methods.** Testing would need to be conducted in each facility in each town where there is sufficient concern to have prospective monitoring. Given the short incubation period of anthrax, it would need to be done daily. And, if it used the surface sampling methods that were successful in Wallingford, it would require use of sample collection from each mail sorting machine by wipe or vacuum. Culturing these samples is cumbersome and time-consuming. We would be lucky to get results back before the first anthrax cases were diagnosed.
However, Wallingford confirmed what most of us in public health originally believed, that static anthrax spore deposits introduced through the mail generally do not result in meaningful respiratory exposure to anthrax. **The experience the**

Trenton, NJ and Brentwood, D.C. facilities showed that airborne exposure occurring immediately with introduction of spores in mail is what we really need to be concerned about. In these cases, it took large numbers of airborne spores that contaminated the whole environment to infect only a small percentage of workers. **From an early detection perspective, this type of contamination might be able to be picked up on 1-2 well-placed settle plates.** These are relatively easy to manage in the laboratory and could result in the identification of anthrax in several days.

This concludes my testimony. Thank you again for the opportunity to describe the investigation of the inhalation anthrax case in Connecticut, the subsequent identification of anthrax in the Wallingford postal facility, and the lessons we learned in the process that may help focus our response in the future. I hope my testimony has been helpful.

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Environmental Sampling for Spores of *Bacillus anthracis*

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On November 11, 2001, following the bioterrorism-related anthrax attacks, the U.S. Postal Service collected samples at the Southern Connecticut Processing and Distribution Center; all samples were negative for *Bacillus anthracis*. After a patient in Connecticut died from inhalational anthrax on November 19, the center was sampled again on November 21 and 25 by using dry and wet swabs. All samples were again negative for *B. anthracis*. On November 28, guided by information from epidemiologic investigation, we sampled the site extensively with wet wipes and surface vacuum sock samples (using HEPA vacuum). Of 212 samples, 6 (3%) were positive, including one from a highly contaminated sorter. Subsequently *B. anthracis* was also detected in mail-sorting bins used for the patient's carrier route. These results suggest cross-contaminated mail as a possible source of anthrax for the inhalational anthrax patient in Connecticut. In future such investigations, extensive sampling guided by epidemiologic data is imperative.

Following the bioterrorism-related anthrax attacks in October 2001, a total of 22 cases of anthrax were identified: 11 confirmed cases of inhalational anthrax, and 11 (7 confirmed and 4 suspected) cases of cutaneous anthrax (1). Epidemiologic investigation of the first nine patients with inhalational anthrax showed that they were exposed to particulate aerosols containing *Bacillus anthracis* when they opened letters or when letters were processed in postal facilities (2).

The final case of inhalational anthrax in 2001, reported on November 19, was in a 94-year-old woman from Oxford, Connecticut, who died (3). Unlike previous cases, the patient was not a postal employee, mail handler, media worker, or government official (1,2). An extensive investigation for *B. anthracis* spores was conducted at her home and other places that she visited in the 2 months preceding her death; all samples were negative (4). Retrospective and prospective surveillance detected no additional cases of anthrax in her community (5,6), and an intentional release of anthrax spores there was considered unlikely. The investigation focused on mail as the source of anthrax; we subsequently conducted intensive sampling of the postal facility that serves her region. We describe the sampling methods, results, and public health implications of repeated environmental sampling in this facility.

The Setting

The regional postal processing center for the patient is the Southern Connecticut Processing and Distribution Center (SCPDC) in Wallingford. With a floor area of 350,000 square feet and the capacity to process up to 3 million pieces of mail a day, the center is in operation around the clock. In November 2001, SCPDC employed 1,122 workers.

The center is equipped with 6 advanced-facer canceller machines, 5 optical character reader machines, 5 bar-code sorting machines, and 13 digital bar-code sorting (DBCS) machines for processing letters. In addition, automated flat sorting machines, linear integrated parcel sorters, and small bundle and parcel sorters are used to process flats (large flat pieces of mail that are not packages) and parcels (wrapped packages). Although all these machines are part of the facility, they differ in function, speed of processing, and location within the facility.

Mail Processing

The advanced facer-canceller machines cancel letters originating from southern Connecticut and apply two bar codes that are used to identify and sort letters for their final destination. The identification tag, a fluorescent orange bar code on the back of the envelope, records the time and date that the letter was canceled. The postnet barcode, a series of vertical full and half bars applied to the front of an envelope, contains zip code and delivery point information in machine-readable format. Advanced facer-canceller machines are used primarily to process stamped mail; bulk letters are not processed on canceling machines because they already have barcodes applied by the mailers and are presorted.

The high-speed computerized DBCS machines are used for preliminary and final sorting of the mail by barcode. During the preliminary sort, letters can be processed on any one of

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the 13 DBCS machines at the facility. This step arranges the letters by the 5-digit zip code of the delivery address, usually requiring ≤2 passes to sort a batch of mail. Once this step is accomplished, mail is transported for final processing to a designated DBCS machine, which sorts the letters to the 9- or 11-digit zip code, usually requiring ≤3 passes. Therefore, letters addressed to the patient could have been processed initially on any of the 13 DBCS machines. Later, the final sort would have been processed on DBCS no. 6, where specific bins were designated for the carrier route.

In October and November 2001, independent contractors working for the U.S. Postal Service (USPS) tested postal processing and distribution plants nationwide to determine if any had become contaminated with *B. anthracis* following the bioterrorism events. As part of this effort, SCPDC was tested on November 11, 2001; all results were negative for *B. anthracis* contamination. Following the report of the inhalational anthrax case in Oxford, Connecticut, the facility was tested again extensively.

Methods

Samples were obtained from SCPDC on November 11, 21, 25, and 28 and December 2. Sampling methods included dry swabs, wet swabs, wet wipes, and HEPA vacuum.

On November 11, a contracting company working for USPS obtained samples from SCPDC as part of the nationwide testing of postal facilities for anthrax spores. The contractor took dry synthetic swabs from random sites in the facility and sent them to be analyzed at the Connecticut Department of Public Health Laboratory. On November 21, 2001, after the report of the 94-year-old woman with anthrax in Connecticut, a second independent contractor hired by USPS collected additional dry swab samples from surfaces where letters, flats, and parcels were processed. These samples, along with others collected from air circulating units, were analyzed by the Connecticut Department of Public Health Laboratory.

On November 25, the investigation team obtained samples from the facility using wet synthetic swabs and processed them by methods recommended by CDC (7,8). Samples were taken from the letter canceling and sorting machines, flat and parcel sorting machines, and five facility vacuum filters in use since October 27, 2001. The samples were analyzed by the Connecticut Department of Public Health Laboratory.

Samples taken on November 28 were more extensive. Guided by additional epidemiologic data, we collected samples from carefully selected sites (the canceling and sorting machines) by using wet synthetic 2x2-inch wipes and HEPA vacuum. Specimens were collected and transported according to recommended methods (7,8). Wipe and vacuum samples were cultured and analyzed at a CDC-contracted laboratory.

On December 2, following the first report of anthrax-positive results in the facility, we collected follow-up samples. A composite sample from the vertical column of four bins was taken from all columns on the four DBCS machines that were presumptively positive based on sampling done on November 28. These wet wipe samples, taken to determine the extent of contamination on the machines, were analyzed by a CDC-contracted laboratory.

Results

A total of 589 samples were collected from November 11 to December 2, 2001. Three hundred forty-six (59%) of these were from the DBCS machines. Of the 589 samples, 117 (20%) were dry swabs, 60 (10%) wet swabs, 300 (51%) wet wipes, and 112 (19%) HEPA vacuum samples.

Fifty-three dry synthetic swab samples were taken on November 11. Of these, only one (2%) sample was from a DBCS machine (no. 6). All samples were negative for *B. anthracis* (Tables 1,2).

On November 21, 64 dry synthetic swab samples were taken. Of these, six (10%) were from the DBCS machines, two each from DBCS nos. 5, 6, and 7. All samples were negative for *B. anthracis* (Tables 1,2).

On November 25, the investigation team took a total of 60 wet synthetic swab samples; 8 (13%) were from the DBCS machines. Of the eight samples taken from the DBCS machines, one sample each was taken from DBCS nos. 1, 2, 9, 11, and 13 and three from DBCS no. 6. All samples were negative for *B. anthracis* (Tables 1,2).

On November 28, the most extensive sampling was conducted, with 212 samples collected. Of these, 102 (48%) were wet wipes and 110 (52%) vacuum samples. We used wet wipes for sampling the stacker bins (hard surfaces) and the HEPA vacuum for sampling the machines, including the inaccessible parts. We focused our sample collection on machines likely to have processed mail delivered to the patient's address. Although all machines were tested, 131 (62%) samples were from DBCS machines, which processed both stamped mail and nearly all the bulk presorted mail; approximately 80% of the mail recovered from the patient's home was bulk mail.

Of 212 samples, 6 (3%) yielded *B. anthracis*, and all positive samples were from DBCS machines. Of the six anthrax-positive samples, two were vacuum samples from DBCS nos. 4 and 10, and four were wet wipe samples from the bins of DBCS machines nos. 10 and 11. One vacuum sample (0.55 g of specimen) from the feeder part of machine no. 10 had 2.9×10^6 CFU of *B. anthracis*, equal to 5.5×10^6 CFU of *B. anthracis* per gram of sample material. Of the mail sorted on this machine, approximately 75% is bulk mail. This machine had not been sampled before November 28, the fourth round of sampling.

Following the results of the sampling on November 28, we collected follow-up samples on December 2. We took samples to determine the extent of contamination on DBCS machines nos. 4, 10, and 11, the machines from which results were positive for *B. anthracis* on the November 28 sampling. In addition, we also collected samples from DBCS machine no. 6 because preliminary positive results from the November 28 sampling were reported and because this machine was used for

Table 1. Number of samples taken from digital bar-code sorting machines during five sampling dates, Connecticut, 2001

Machine no.	11/11/01	11/21/01	11/25/01	11/28/01	12/02/01	Total samples
1			1	8		9
2			1	8		9
3				8		8
4				11[a]	48[a]	59
5		2		12		14
6	1	2	3	23	48[a]	77
7		2		12		14
8				8		8
9			1	8		9
10				8[b]	52[c]	60
11			1	8[a]	52[d]	61
12				8		8
13			1	8		9
Total	1	6	8	130	200	345

[a]One positive sample.
[b]Four positive samples.
[c]Thirty positive samples.
[d]Three positive samples.

final processing of mail to the address of the patient. The 200 wet wipe samples taken on December 2 were composite wipes from a vertical column of four bins from each machine (each machine has 48–52 columns of four bins). We collected composite samples to allow complete sampling of all bins from all suspect machines without taking an excessive number of samples (Table 2).

Of 200 composite column samples from DBCS machines nos. 4, 6, 10, and 11, a total of 35 (17.5%) columns of bins were positive. On machine no. 10, 30 (68%) of 52 columns were positive. Three (6%) of 52 columns from machine no. 11 and 1 (2%) of 48 columns on both machines no. 4 and 6 were positive. These results confirmed the high contamination of machine no. 10. Only 1 of 48 columns of bins on machine no. 6 was found to be positive. Machine no. 6 was used for final mail sorting for several zip codes including the town where the patient lived. The only column of bins that yielded *B. anthracis* on DBCS no. 6 included bins for the carrier route for the patient's home.

Discussion

Supplemented by the findings of the epidemiologic investigation team, our investigation identified cross-contaminated mail as a possible source of anthrax for the Connecticut patient (4). No other source of contamination in her community was identified after extensive sampling of her home and areas she visited; no other cases of anthrax were reported. We identified a contaminated sorting machine that was used to sort most of the mail delivered to the patient, including bulk mail; the specific column of bins that held mail for her carrier route was positive (4). Extensive sampling with large numbers of samples was required to find anthrax spores. Positive results were obtained following sample collection based on information learned during the epidemiologic investigation. All positive results were obtained from samples collected by using wet wipes and vacuum sampling. All the dry or wet swab samples were negative for *B. anthracis*.

Environmental sampling during an anthrax investigation is critical in determining the likely source of infection and the extent and degree of environmental contamination, to support decisions on the need for prophylaxis with antibiotics or clean-up, and to provide guidance about when clean-up is adequate to permit reentry into an area. During this investigation, no validated methods for specifically sampling the environment for *B. anthracis* were known. We lacked data on the effectiveness of the sample collection media (swabs, wipes, and vacuum) for typical porous and nonporous surfaces encountered in indoor environments. The effect of varying concentrations of *B. anthracis*-containing particles and dust loading on sampling efficiency had also not been studied. Furthermore, recovery efficiency of the analytical methods (efficiency of removal of *B. anthracis* spores from the sample collection media) had not been adequately evaluated, and limits of detection have not been established (8).

Although our investigation showed that different sample collection techniques and sampling sites and numbers of samples yielded different findings, results are based on observation and cannot be used to specifically compare the different approaches. However, exploring the reasons for the different results may be useful for future investigations. On November 11, all samples were collected by using dry swabs from random sites in the facility with the intent of finding contamination anywhere in the facility. Only one sample from the DBCS machines was taken. On November 21, more samples were taken from the DBCS machines, but still only three machines were sampled. This sampling was performed with emphasis on the Oxford mail route because the illness had been reported in that community. However, whether the patient's mail was predominantly bulk mail and whether letters could have been sorted preliminarily on any DBCS machine were not known at the time. The November 25 sampling was similar to the November 21 sampling except that investigators used wet swabs instead of dry swabs. Again, limited samples from six DBCS machines were taken.

On November 28, more extensive and directed sampling was conducted, and epidemiologic information was available to guide us to the appropriate sites. Using wet wipes and HEPA vacuum led to the first positive results for anthrax in the facility. A recent study, conducted after the Connecticut investigation, has confirmed our findings (WT Sanderson et al., unpub. data). In this study, side-by-side surface swabs, wipes, and HEPA vacuum samples were taken at the Brentwood Processing and Distribution Center in Washington, D.C., to compare their relative effectiveness in a contaminated postal facility. Wet wipes and vacuum sampling were found to be

Table 2. Environmental sampling methods, types, and results of samples taken November 11–December 2, Southern Connecticut Processing and Distribution Center, 2001[a]

Sampling date	No. of samples	Samples from DBCS	Type	Positive results	Sample collectors
11/11/01	53	1	Dry swabs	0	USPS
11/21/01	64	6	Dry swabs	0	USPS
11/25/01	60	8	Wet swabs	0	CDC/ATSDR
11/28/01	212	131	Wet wipes and vacuum	6	CDC/ATSDR
12/02/01	200	200	Wet wipes	35	CDC/ATSDR
Total	589	346		41	

[a]DBCS, digital bar-code sorting; USPS, United States Postal Service; CDC, Centers for Disease Control and Prevention; ATSDR, Agency for Toxic Substances and Disease Registry.

more effective methods than surface swabs; results from wet wipes and vacuum samples were highly concordant. Of 28 sample locations tested, 4 (13%) were positive with dry swabs, compared with 13 (46%) wet swabs, 23 (82%) wet wipes, and 23 (82%) vacuum samples (WT Sanderson et al., unpub. data).

Although the effectiveness of sampling techniques influences which are used, other factors that determine the choice of sampling techniques include the site of sampling, size of the surface to be sampled, character of the surface (porous or nonporous), need to quantify the results, and preference and specialization of the laboratory where the test is done. Swab samples may still be the best method to sample small hard surfaces not easily accessible for wiping or vacuum sampling (e.g., a keyboard). Surface wipes also have several limitations (8). Wipe samples might miss minimally contaminated surfaces or small, discrete contaminated areas. In addition, sampling all surfaces within a building by using surface wipes is not feasible. Therefore, vacuum samples provide an important tool for maximizing the surfaces that can be evaluated during an investigation (8).

Sampling methods and number of samples are also influenced by the circumstances of the potential contamination. A sufficient number of samples must be taken to increase the probability that the sampling is representative, given the likely extent of contamination. In an initial investigation where a known or suspected release of potentially contaminated material has occurred, the first priority should be to collect samples near the suspected release source (often called directed or targeted sampling). In determining the extent of contamination, investigators should include coverage of areas along an anticipated contaminant pathway, i.e., those associated with air movement or dust collection, as well as activities that result in re-aerosolization or cross-contamination.

When sampling to identify contamination in a facility, the length of time between the suspected contamination of the facility and the time that sampling occurs is also important in determining where and how to collect samples. For example, since the sampling on November 11 was conducted >3 weeks after contamination was probably introduced into the facility, any aerosolized spores of *B. anthracis* had likely already settled on surfaces, and therefore surface sampling, as opposed to air sampling, was reasonable.

The environmental investigation did not identify anthrax spores in the patient's home, possibly because her house was routinely cleaned thoroughly or because the piece of mail that was the source for her infection was not identified. One resident of her community is known to have received an envelope from which *B. anthracis* spores were isolated that was likely to have become cross-contaminated as it passed through the postal system, although no one in that household became ill (2). The patient also probably became ill following exposure to a low number of *B. anthracis* spores, which may explain why she had a relatively long incubation period compared with the other cases reported (9,10). Other host factors, including advanced age, underlying lung disease, medication use (2), and the practice of tearing up bulk mail (4), may have increased her chances of acquiring the disease.

The results of our investigation influenced the adherence and compliance of postal workers on postexposure prophylaxis at SCPDC. A study conducted there showed that 13% of the postal workers stopped taking postexposure prophylaxis because of the initial report of negative environmental cultures in the facility. An increase in postexposure prophylaxis adherence occurred, however, following the positive results in the facility (11).

The reasons why no postal workers at SCPDC became ill during this event are unknown. Perhaps host factors were important or anthrax spores were not aerosolized in sufficient concentration. The finding that spores were not widespread in the facility suggests that the dispersion was likely not due to substantial aerosolization. Following the experience from the Brentwood facility in October 2001, cleaning practices in postal facilities nationwide changed from use of compressed air, which easily aerosolized small particulate materials such as anthrax spores, to use of HEPA vacuums for cleaning (12). At SCPDC, maintenance workers stopped using forced air to clean equipment on October 27, 2001, which may have reduced the time when spores could have been aerosolized. The highly contaminated DBCS machine could have been a source of exposure to postal workers if the cleaning measures had not been changed.

The environmental investigation was central in demonstrating a possible source of infection for the case of inhalational anthrax in Connecticut. Our investigation showed that

extensive sampling was required and that epidemiologic investigation was essential in identifying sites for sampling. None of the dry or wet swab samples were positive. For future investigations of large facilities, we recommend the use of wet wipes and vacuum. Further research is needed to clarify the sensitivity of the sampling and analytical methods for known or suspected *B. anthracis* and to develop clear algorithms for sampling if future investigations are needed. This investigation also demonstrated that illness associated with cross-contaminated mail is a rare but possible phenomenon.

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Mr. SHAYS. I am amazed that three of our witnesses have finished 10 minutes to practically the second and with very good testimony, I might add.

Mr. Layne, you will finish up, and then we'll have you get our questions.

Mr. LAYNE. Yes, Mr. Chairman. I have a shorter summary of my written statement for you.

Mr. SHAYS. Thank you.

Mr. LAYNE. Mr. Chairman, members of the subcommittee, I'm Davis Layne. I'm the Deputy Assistant Secretary for the Occupational Safety and Health Administration.

Mr. SHAYS. Lift that mic up a little higher, I'm sorry.

Mr. LAYNE. Thank you for this opportunity to testify about the Occupational Safety and Health Administration's role in dealing with anthrax at a U.S. postal facility, and about the lessons learned from anthrax contamination, and about the detection and remediation at the Wallingford, CT, postal facility.

Also here today with me is Rich Fairfax, who is the Director of OSHA's enforcement programs.

The Occupational Safety and Health Act requires that each employer furnish to each of his employees conditions of employment and a place of employment that are free from recognized hazards that are causing or likely to cause death or serious physical harm. A 1998 revision to the OSHA Act expanded the definition of "employer" to include the U.S. Postal Service. Since 1998, the OSHA Act has applied to the U.S. Postal Service in the same manner as it does to any other employer.

After post offices were discovered to be contaminated by anthrax in the mail, OSHA worked with the Post Offices' United Command Center throughout the anthrax crisis. We provided technical assistance with sampling and decontamination of the Brentwood facility in Washington, DC, and another facility in Trenton, NJ. Because of this involvement in April 2002, the Postal Service asked OSHA to become involved in sampling and decontamination of the high bay areas of the Wallingford facility.

At the Post Office's request, OSHA provided staff and information to a U.S. Post Office contractor with technical advice on sampling for anthrax exposure in the high bay areas. On May 29, 2002, the American Postal Workers Union filed a formal complaint with OSHA's Bridgeport area office alleging that the Postal Service in Wallingford was not complying with the requirements of 29 CFR 1910.1020, which is access to employee exposure and medical records; and then on May 31, 2002, the union filed a second complaint against the Postal Service alleging that inadequate hazard assessment in violation of 29 CFR 1910.132, which is personal protective equipment.

Then on June 5, 2002, in response to these complaints, OSHA's Bridgeport area office initiated an inspection of the Wallingford facility. Following the inspection on October 7, 2002, OSHA sent a letter to the Postal Service. In that letter it said, although a citation was not warranted, the Postal Service's failure to effectively communicate with its employees requires attention. OSHA typically sends this type of letter when an inspection discloses safety or health deficiencies that will not be cited.

Subsequent to the events at Wallingford, OSHA has taken a number of actions to help protect worker safety and health. OSHA participated in the development of the National Response Team's document "Technical Assistance for Anthrax Response," which provides the most current information available to the Federal Government and shares experiences in responding to intentional release of anthrax spores in urban environments. Among other things it addresses improved methodologies that OSHA adopted for anthrax detection before and after cleanup, as well as methodologies to minimize inconsistencies related to sampling methods, increase the ability to validate sample results, and conduct comparative analysis of area samples. The use of these methodologies could eliminate some of the sampling problems experienced at Wallingford.

In conclusion, we all know that this is a difficult time for our country. We as an agency have learned a lot from the anthrax incidents at the postal facility as well as our participation in the events at the World Trade Center and the Pentagon, and we're working diligently to ensure that any future response is built on lessons that we have learned as well as the successes we have had. In this way we can most effectively contribute our talents to the Nation's emergency preparedness and response to catastrophic events. Worker safety and health is a critical component of any response, recovery and remediation operation.

OSHA has demonstrated that we have the technical expertise and organization to ensure protection of workers. However, we are continually looking for ways to better improve our performance, and I would be pleased to address any of your questions. Thank you.

Mr. JANKLOW [presiding]. Thank you very, very much, Mr. Layne.

[The prepared statement of Mr. Layne follows:]

STATEMENT OF R. DAVIS LAYNE
DEPUTY ASSISTANT SECRETARY OF LABOR FOR
OCCUPATIONAL SAFETY AND HEALTH
BEFORE THE
SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING
THREATS, AND INTERNATIONAL RELATIONS
COMMITTEE ON GOVERNMENT REFORM
UNITED STATES HOUSE OF REPRESENTATIVES

MAY 19, 2003

Mr. Chairman and Members of the Subcommittee:

Thank you for this opportunity to testify about the Occupational Safety and Health Administration's (OSHA) role in dealing with anthrax at United States Postal Service (USPS) facilities and lessons learned from anthrax contamination, detection and remediation at the Wallingford, Connecticut postal facility.

As you know, OSHA's mission is to assure safe and healthful working conditions for America's working men and women. The Occupational Safety and Health Act (the OSH Act) requires each employer to furnish to each of his employees conditions of employment and a place of employment that are free from recognized hazards that are causing or are likely to cause death or serious harm. A 1998 revision to the Act expanded the definition of "employer" to include the United States Postal Service (USPS). Since 1998, the OSH Act has applied to the USPS in the same manner as it does to any other employer.

Assuring worker safety and health is not only a critical element in everyday work but also a vital part of our Nation's domestic preparedness and emergency response efforts -- an

essential component of our Nation's homeland security strategy. OSHA assists in domestic preparedness and response activities, such as the activities related to the anthrax contamination at the USPS facility in Wallingford.

OSHA's primary concern with emergency preparedness efforts is to ensure that worker safety and health are effectively addressed. The Agency's existing structures and programs also provide focus and expertise to increase emergency preparedness in the workplace and among responders. In this capacity, after the workplace threat of anthrax was first identified, the Agency published several anthrax-related documents on our website, including an Anthrax Matrix that offers basic advice and suggests protective measures that we believe will reduce the risk of exposure in light of concerns about the presence of anthrax spores in the workplace. Most recently, we published a Model Health & Safety Plan for Clean-up of Facilities Contaminated with anthrax spores.

In September and October 2001, letters containing anthrax spores were mailed to news media personnel and Congressional offices and contaminated several US Postal Service facilities. In November of that same year, a woman in Connecticut died from exposure to anthrax spores, spurring an investigation that was directed by the Connecticut State Health Department with the assistance of the Centers for Disease Control and Prevention (CDC). The investigation identified anthrax-contaminated mail that had been processed in the USPS Southern Connecticut Processing and Distribution Center at Wallingford as the likely source of the anthrax responsible for her death. An Incident Response Team made up of representatives from government agencies with responsibility for law

enforcement, environmental safety, bioterrorism, public health and safety and emergency management coordinated the investigative and cleanup activities at the Wallingford facility and analyzed and interpreted the findings of these activities. OSHA was not a part of this team and was not involved in the activities at Wallingford at this time.

The Incident Response Team, with the aid of a contractor hired by USPS, conducted surface sampling at the Wallingford facility in late November 2001, reporting results to USPS in early December 2001. The purpose of the sampling was to determine which locations in the facility were contaminated with anthrax spores so that cleanup activities could be directed efficiently. In the January/February 2002 time frame, the American Postal Workers Union (APWU) asked the USPS for copies of all anthrax test results and documents related to testing. The USPS gave APWU a spreadsheet with a list of the surface sample results that indicated for each sample whether anthrax was found or not found, but did not provide quantitative results. Subsequently, the APWU learned that the USPS had records associated with each positive sample. The APWU requested these records on several occasions.

OSHA had been working with the USPS United Command Center throughout the anthrax crisis and had been giving technical assistance with sampling and decontamination of the Brentwood postal facility in Washington, D.C. and another facility in Trenton, New Jersey. Because of this involvement, in April 2002, USPS asked OSHA to become involved in sampling and decontamination of the high-bay areas of the Wallingford facility. At USPS's request, OSHA staff provided technical advice to a USPS contractor

on sampling for anthrax exposure in the high-bay areas. OSHA staff also reviewed the USPS Health and Safety Plan for cleanup of anthrax contamination of those areas and provided oversight of the implementation of the health and safety plan during the cleanup of the high-bay areas. Our role, at that time, was one of technical assistance.

On May 29, 2002, the APWU filed a formal complaint with OSHA's Bridgeport Area Office, alleging that the USPS in Wallingford was not complying with 29 CFR 1910.1020 (Access to Employee Exposure and Medical Records). On May 31, 2002, APWU filed a second complaint against the USPS in Wallingford, alleging an inadequate hazard assessment in violation of 29 CFR 1910.132 (Personal Protective Equipment).

OSHA's regulation on Access to Employee Exposure and Medical Records provides employees and their designated representatives the right of access to relevant exposure and medical records. The OSHA regulation cited in APWU's second complaint, Personal Protective Equipment, requires an employer to conduct a certified hazard assessment, determine needs for personal protective equipment based on the hazard assessment, provide clean and appropriate personal protective equipment, and train the employees in the use of the equipment. APWU asserted in its May 31st complaint letter that USPS did not provide a copy of the certified and signed hazard assessment as required by Sections 1910.132(d)(1) and (2). On June 5, 2002, in response to these complaints, OSHA's Bridgeport Area Office initiated an inspection of the USPS.

During this inspection, managers for USPS explained that they had encountered several problems that would make release and interpretation of the quantitative data collected in November and December of 2001 difficult if not impossible. (These data were collected before OSHA's involvement with this facility.) USPS believed that the November/December sampling data could not be validated for several reasons. First, three different sampling methods were used and there was no method of correlating results taken by these different methods. Second, the method used to collect a number of the samples was not recorded. Third, the extent of the surface area wiped or vacuumed for each sample was not measured or recorded, making it impossible to obtain any meaningful quantitative information from the sample. The Incident Response Team stated that it was reluctant to release data that could not be validated, and advised the USPS that the only useable data related to the investigation were the qualitative data supplied to the APWU on February 6, 2002.

On September 4, 2002, during the OSHA inspection, USPS provided APWU with the requested records. Following the inspection, on October 7, 2002, OSHA sent a letter to the USPS notifying it that, although citation was not warranted, USPS's "[f]ailure to effectively communicate" with its employees "require[s] attention." OSHA typically sends this type of letter when an inspection discloses safety or health deficiencies that are not cited. Because the inspection had been initiated by a complaint from the APWU, OSHA also notified the union of the inspection results. When the union exercised its statutory right to request an informal review of OSHA's findings, OSHA provided additional explanation in letters dated November 26, 2002 and February 19, 2003.

A number of factors contributed to OSHA's decision not to cite USPS for the delay in providing detailed exposure records. The anthrax crisis was a unique event, involving an ongoing multi-agency criminal investigation into the source of the anthrax spores. USPS notified the employees of the contamination as soon as it was discovered, and took appropriate action to protect the employees from anthrax illness. In addition, at the time of the inspection, OSHA's Area Office believed that USPS did not realize that it had the requested records in its possession, and that USPS had provided its employees with those records shortly after it discovered them.

OSHA has initiated several actions since the anthrax crisis and the events at Wallingford. To help protect public health and safety by providing the most current information available throughout the Federal Government, and sharing national experience in responding to intentional releases of anthrax spores in urban environments, OSHA participated in the development of the National Response Team's document, "Technical Assistance for Anthrax Response." This document provides the most current information available from the Federal Government and shares experiences in responding to intentional releases of anthrax spores in urban environments. It addresses, among other things, improved methodologies that OSHA adapted for anthrax detection before and after cleanup, as well as methodologies to minimize inconsistencies related to sampling methods, increase the ability to validate sample results, and conduct comparative analysis of areas sampled. The use of these methodologies could eliminate some of the sampling problems experienced at Wallingford.

Most recently, OSHA has participated in last week's TOPOFF exercise, and is now evaluating the effectiveness of our role. OSHA is also actively participating with other Federal, local, State and private organizations to develop a sound emergency preparedness and response system to protect America's homeland.

We continue to develop further operational and procedural guidance for our regional administrators and staff. The regional offices are presently establishing local infrastructures and completing the groundwork necessary to participate in emergency response activities across the Nation.

In conclusion, we all know that this is a difficult time for our country. We, as an Agency, have learned a lot from our participation in the events at the World Trade Center, the Pentagon, and the anthrax incidents at the USPS facilities. Our Agency is working diligently to ensure that any future OSHA response is built on the lessons we have learned as well as the successes we have had. In this way we can most effectively contribute our talents to the Nation's emergency preparedness and response to catastrophic events. Worker safety and health is a critical component of any response, recovery and remediation operation. OSHA has demonstrated that we have the technical expertise and organization to ensure protection of workers; however, we are continually looking for ways to improve our performance.

I would be pleased to address your questions.

Mr. JANKLOW. And the chairman has left the room for a short period of time. I will yield myself 10 minutes for a round of questioning, and I'd like to start off with you, Mr. Day, if I could.

I wear trifocals, but my hindsight is 20/20. I see well behind me. Given history as you look back on it, would the Postal Service have notified the employees as to exactly what it is that they found, especially their representatives when they came forward and asked?

Mr. DAY. I think with hindsight absolutely. I think—and you have heard it during the testimony today, and some of the answers to your questions, there still is a bit of confusion and disagreement even about what 3.2 million colony-forming units really means, particularly as you try to bring it to what does that mean for health risks.

I think clearly that communicating 3.2 million CFUs would have effectively given our employees more information that they needed, absolutely. We're trying to give them the best possible information.

Mr. JANKLOW. I think the testimony I have heard people talk about, well, it's 8,000 to 10,000 is the threshold at which about it will kill half the population was the guesstimate from before. Then you find a machine that's got 3 million spores on it. None of us know the number. But if the number wasn't significant, if there was not a reason for withholding it, it probably would have been disclosed. My guess is it was concern about panic and a lot of other concerns about workers and the general public. Notwithstanding what the issue may have been, and if I can ask you, Mr. Layne, does not OSHA require specific information being given to employees once it's ascertained? Isn't that what OSHA requires?

Mr. LAYNE. Yes. The OSHA standard under medical access to records, 29 CFR 1910.1020, requires that when an employee requests the information concerning medical monitoring data, that it be provided to them within 15 working days.

Mr. JANKLOW. Because that wasn't done, and given the enormity of what was going on in the country, my State government shut down. Every municipal government shut down. Nobody wanted to handle the mail. I live in a State that's slightly smaller than Great Britain, and people were flying samples in chartered airplanes of anything that was white or powdery that they received in the mail to the State laboratories. And only God knows what the total amount of expense was to this Nation in terms of the activity people took and the panic that took place.

Why is it that OSHA chose to make—to give a letter as opposed to cite the Postal Service; what is it that let them off the hook in this instance?

Mr. LAYNE. Well, there are a number of factors. No. 1, the information provided to the employees initially was the raw data that showed that——

Mr. JANKLOW. I think it said trace amount, didn't it?

Mr. LAYNE. Yes. It showed it was either in positives or negatives, and of all the samples, it would say trace amount. That information was provided to employees on a timely basis. The question then comes to the quantitative data, and as we looked at the information and conducted our investigation, there were a number of factors that we took in consideration, and there was a criminal in-

vestigation that was ongoing at the time. We had been in the facility early.

Mr. JANKLOW. Excuse me, is that the same standard you apply in the private sector; if there's a criminal investigation going on, then you kind of back off a little?

Mr. LAYNE. It would be a factor we would consider in any of our investigations, whether it's with the Post Office or with another private sector employer.

Mr. JANKLOW. What other—and they got to 3 million, and given the fact that I've never heard before that 3 million was a trace amount of anthrax, this is the first time I've ever heard this quantified as that. I spent many years—the last couple of years as chief executive of my own State where we dealt with in a lot of detail—historically we've dealt with anthrax. I've never heard 3 million spores ever defined as a trace amount.

Yes, sir. Go ahead, Dr. Hadler.

Dr. HADLER. If I can try to clarify at least the initial use of the word "trace." It is important to point out that there was a time sequence to results coming back. The results from the November 28 testing, which is the first positive tests, and also had the sample with the——

Mr. JANKLOW. The hundreds.

Dr. HADLER [continuing]. Millions of spores first came back through a phone call saying that we have a few samples of the 200 that were taken that are positive, and we asked, can you tell us anything more about that? They said, actually there are about four samples or six samples from four machines. One of them we're not 100 percent sure of.

Mr. JANKLOW. But, Doctor, what I'm getting at——

Dr. HADLER. They told us.

Mr. JANKLOW. After the first couple of times the union was still asking. They were still asking for—I mean, I'm not complaining about 5, 6 weeks; a couple months later and they still aren't giving the information. As a matter of fact, they were not given the information until after they complained to OSHA about it.

Dr. HADLER. In terms of the exact information.

Mr. JANKLOW. That, I believe, complaint was filed in May, end of May. OSHA got it about a week later.

Dr. HADLER. About 4 days after knowing there were a few cultures that were positive is when we had done additional sampling that showed that there were many cultures positive on the one machine plus the one highly concentrated sample, and that at that stage there were a lot of discussions, but what the communication was with postal workers themselves is another question in terms of changing that from trace to heavy contamination.

Mr. JANKLOW. Mr. Layne, another question I have for you, sir. This was an emergency situation. We hadn't been through this before in this country. Given the situation, we have that kind of emergent situation behind us, so is OSHA in the process of requiring the disclosure of this kind of information to workers or their representatives and the public in an emergent situation?

Mr. LAYNE. Yes, sir. We've received the last month the recommendations from——

Mr. JANKLOW. From GAO.

Mr. LAYNE. Report. We are in the process of, our health professionals and standards, a group, looking at that. Also we're awaiting the information from the National Response Team to look at that and see what's the best way to proceed.

Also, it's important that we get information out to the workers as soon as possible, so it may also be that a good approach is to get some immediate guidance out to workers so that they can look at OSHA's Web site. We have a lot of information on our Web site dealing with anthrax, on how to handle it, how—what the sample results mean, and how employers and employees can respond to the sample results, but we're looking at the GAO recommendations right now.

Mr. JANKLOW [presiding]. Mr. Burrus, if I could ask you sir, is there a satisfaction among the group that you are representing, the human beings that you represent, that changes have taken place in terms of the procedure or protocols that would be followed in the future were this to happen again.

Mr. BURRUS. No. No. The employees have the right to look to their government, their employer, and their union to respond to their safety needs. The employer and their government failed miserably.

Mr. JANKLOW. Talking about the future.

Mr. BURRUS. Absolutely not. The effort to install detection equipment is going to be insufficient to protect the workers and the American public.

Mr. JANKLOW. Mr. Day, I am concerned about something. You are talking about putting the top 100 facilities—this equipment in the top 100 facilities.

Mr. DAY. No, sir. They are biodetection systems and actually there have been several misstatements here today, misunderstandings about how that system works.

Mr. JANKLOW. Go ahead and explain it because it is important we all know.

Mr. DAY. There's two fundamental parts to the system. It uses continuous air sampling. It is placed at the very front end of our automated process where on a daily basis collection mail—and that is deemed as the high-risk, high-threat mail—we handle about 115 million pieces of collection mail. It's brought in from individual residences, businesses, and the blue collection box out on the corner. This was the source of the attack in 2001 and that is still deemed as high risk or the highest of risks.

So at the very first point in our automated system, we will do continuous air samplings. So to correct earlier misstatements, this is not about an air sampling throughout the building. This is a very focused, targeted sampling technique on the front end of our automated process. The continuous air sample is gathered and then turned into a liquid sample and then utilizes a technology called polymerase chain reaction that does DNA amplification. That means it can take very small quantities of a substance, amplify the DNA that's there, and then we do a specific gene sequencing unique to anthrax. Our test results have been exceptional both in use of surrogates—in a live processing environment as was explained earlier, you cannot test live anthrax in a live processing environment.

Mr. JANKLOW. One other brief question. Does this biodetection equipment have the ability to also look for other types of chemicals, biological agents, and toxins?

Mr. DAY. What this is capable of doing is screening for multiple biological agents. It is using DNA. When you get into chemicals or even biotoxins that has been processed, that all DNA is removed, is not capable of detecting that; that requires a different technology. However, the system has been designed in a way that as those technologies mature, they can be incorporated into the same system.

Mr. JANKLOW. Thank you, Mr. Chairman. Thank the gentleman. Ms. DeLauro.

Ms. DELAURO. Thank you, very much, Mr. Chairman. I have got a bunch of questions, but I think it is important just to cite something that Mr. Burrus said, and I think my colleague just mentioned this as well. OSHA knew, the Postal Service knew, the CDC knew, the Connecticut Health Department knew. The only people who did not know were the workers at this facility. I think, in fact, that speaks volumes and it's one of the reasons why we're here today.

Mr. Day, let me ask you several questions. What was the reasoning behind using a Postal Service contractor to conduct the initial tests on the Wallingford facility rather than going to the experts at CDC?

Mr. DAY. The contractors we use, we used actually four of them nationwide as part of our nationwide environmental management program. We have four contractors who were capable, remain capable.

Ms. DELAURO. Accredited in terms of being able to deal with biological agents, etc., all the accreditation that's required.

Mr. DAY. Yes.

Ms. DELAURO. Do you think this contributed to the delayed finding of the anthrax contamination in utilizing—who recommends—well, they are attached to you, so it's a question of internally within the USPS that then the individual is assigned and that's approved—what's the process?

Mr. DAY. For the selection of these contractors?

Ms. DELAURO. Not to go back to that, but new situation; anthrax, where is it going? What's it about? They had the accreditation, so you don't have to go to anybody else outside of USPS to be able to contract with any of these people.

Mr. DAY. We did need to go outside the contract, but what we did throughout this process is work closely with the other Federal agencies, principally CDC, for their best advice. It was agreed that these contractors were capable and we used CDC-approved laboratories for the sampling results.

Ms. DELAURO. So you in conjunction with CDC made a determination that these Postal Service contractors that you had could do the job; is that correct?

Mr. DAY. To be honest with you, I don't know the full extent of how that discussion went, but there was general knowledge that here are the four contractors you are using and here is the sampling protocol we're going to use.

Ms. DELAURO. The reason why I asked the question is because they utilized for the first two tests, on the 11th and the 21st, the dry swab methodology—first three—dry swab methodology. Mr. Skolnick said that the literature back to 1917 indicated that this wasn't a terribly effective methodology, but—I just wanted to get—but that's where these folks went. And I want to know how we got to those individuals.

Mr. DAY. The contractors were doing the sampling protocols we specified for them to do. If we specified wet swab or wet wipe, they would have done that.

Ms. DELAURO. Then the determination of how we proceeded was not their decision. But whose decision then, dry swab, wet swab, HEPA?

Mr. DAY. That was a decision being made by the postal management working with the advice of public health agencies. And when it was advised to go wet wipes and HEPA vacs, that's what we moved to.

Captain MARTINEZ. As far as clarification, CDC really didn't have any buy-in on—other than a general opinion on contractors. We have no bias. We have no endorsements other than being perhaps trained in industrial hygiene. We did recommend the analytical labs because it is part of the CDC, with other agencies' laboratory response network, who have been appropriately trained and have the reagents to not only look for presumptive positives but also confirm those samples, just for clarification.

Ms. DELAURO. Captain Martinez, do your laboratories have the ability to validate the tests that we're talking about here? Can you validate?

Captain MARTINEZ. Validation from our perspective is meeting or exceeding some type of measurement or sampling performance criteria, and it's something that NIOSH actually does, my particular center, on a regular basis for chemical agents. But these laboratories, we're working toward that, as suggested in my briefing. We have a contract with Dugway Proving Ground, who's actually looking to provide information on limited protection, on repeatability of these collection efficiencies and recovery efficiencies for analysis for both air and surface samples.

As far as the laboratory response network, it's important to note that early on in our investigation the LRN was developed around a clinical model, meaning that these labs were designed because they are so intricately linked with the public health system to analyze clinical samples. It took time throughout this outbreak investigation to educate them about the new requirements.

Ms. DELAURO. I don't mean to interrupt you, Captain Martinez, but do we have the capability at the CDC to validate these tests? Should this happen again, do we now, then, have to go to another process of figuring out how we deal with validation?

I sit on Labor-HHS, and CDC comes before us all the time. Is this an appropriate question to ask them? Do we have the ability to take what happened at the Wallingford facility with the tests, go to the laboratory and get this validated, so there is in fact no stumbling block in allowing people to understand what their environment is all about?

Captain MARTINEZ. We have been doing that both internally at CDC and our laboratories and also through the contracts we have.

Ms. DELAURO. And you did not have that capability in 2001 when this occurred.

Captain MARTINEZ. Perhaps we had the capability, but at that time our laboratories and all others involved were inundated with responses to the anthrax investigations.

Ms. DELAURO. So there's a difference between having the capability and being unable to implement the capability for a variety of reasons; but you had the capability to validate?

Captain MARTINEZ. Yes, ma'am.

Ms. DELAURO. So we could have validated if we had pursued this.

Mr. Day, what advice did you get from Public Health officials that led to the withholding of the information?

Mr. DAY. My understanding—and I must say I was not directly part of the conversation, there was a discussion about once we had the quantitative results—and that was not typical. And I was involved extensively throughout this, particularly with the situation here in Washington as well as in New Jersey—we were not getting quantitative results. We were getting qualitative results: positives, negatives. When we got positives, it was simply that; not a quantity associated with it. So this was somewhat unique.

And in Connecticut, the local management team there from the Postal Service, working with the Department of Public Health officials in Connecticut, had a discussion about what is the best way to share the information. Clearly the Postal Service was responsible for taking the lead to announce it to the employees, but as I understand it, a determination—rather than releasing quantitative results, it was put in a qualitative form, beyond just positive. And to clarify something, on December 2, the term "trace amount" was used. However, when the subsequent tests came in, there was a clear change that was made even in the press releases that called it a "concentration of spores." So the terminology changed, but the actual release of the quantified result was not given out. I was not privy to the direct conversation. So why that nuance crept in I am not sure.

Again I think the earlier question, in retrospect in the future we can share that quantitative data, and we should share that quantitative data.

Ms. DELAURO. I think that is important to get that on the record. And in the prior panel we heard that in fact the word "trace amounts" was misleading. And I don't, you know, want to take a look at whether the term "concentrated amounts" is equally as misleading as to, you know, a full disclosure and right to know, since a variety of other agencies did know and there is a lot of, quite frankly, passing the buck and covering—I don't say covering up—but, you know, just kind of dancing around this effort.

Mr. DAY. I think as we move forward and understand the obligation to release the quantitative data, there also needs to be a collective agreement of how do you translate a quantitative number, 3.2 million CFUs per gram, whatever the measure might be, into layman's terms. If "concentration of spores" is not correct, it may very

well not have been. We need to put it in terminology that people can understand and react to appropriately.

Ms. DELAURO. But people will react—I have always found this, and have spent a lot of time with people on a regular basis, that if you're up front with them and you're straight with them, and say we have a problem here, friends, we got a problem, more than we anticipated, I think we can deal with this, but you are at risk. People are adults. You have to know what the nature of the problem is so you can deal with it. Some of these people did not take Cipro because they felt it was trace amounts. So in simple terms, you don't need to give them the scientific terms, but give them the knowledge that they need in order to make sure they can care for themselves and their families and make a decision about how they want to proceed with their public health.

I would guarantee that most of these people would have stayed on the job, too, if you told them you could take care of it. They stayed there. No one else had to be there every single day, but they stayed there. Let me just—my time is up—let me just—I too, have a difficulty with understanding but I think we got to the conclusion on this with regard to OSHA.

The difference between December and the following September is unconscionable in terms of information being released to people, and why the Postal Service was not cited is a mystery to me. And I think we have to take a look at what we are doing at OSHA, if we can continue with these procedures in another sense.

Let me just ask a question that has to do with the future. I think failure to inform the workers of the extent of this contamination, I think really calls into question the faith that workers have in the management of the facility. What kinds of steps is the Postal Service taking to rebuild that trust between workers and management, and, at the same time, what are you doing in terms of enacting these recommendations that the GAO has outlined?

Mr. DAY. Well, unfortunately, we actually had a couple of opportunities to not just create the plan but to exercise it. In the case of Wallingford, we had the high bay cleanup, the upper part of the building needed to be cleaned. The issue was raised both by the district manager in Connecticut and the area vice president of the northeast area personally called me about it, and we are very concerned and we established protocols for that kind of cleanup and we did the testing. When we had the positives, that was clearly communicated, as was the cleanup procedure, and then ultimately retesting to make sure that it was adequate.

I was personally involved with the situation here in Washington on January 14 of this year where we had a false positive result over at the Federal Reserve. We made an immediate decision to do a precautionary round of testing and closed the government mail facility here in Washington. Our district manager personally briefed the employees. We did the extensive testing. We let them know the results the next day. So we have not only created the plan but, unfortunately, we had to exercise the plan.

Ms. DELAURO. I want to say this to you, just this final comment. You know during this period of time, I think it's fair to say I was on the phone almost on a daily basis, because there were so many conference calls going on, two or three conference calls a day. And

I asked, I asked the Postal Service, I asked people to keep me informed of what was going on, and I suggested shutting the plant down. I suggested shutting the plant down. What is irritating to me is that I spent hours and hours on the telephone with government agencies, and I presumably have a responsibility as a Member of this institution, as a public servant, as someone gets elected to carry out responsibilities of full faith and credibility—at no time, no time, was I informed of any of this.

So that this was a shell game of the agencies who knew what was going on, talking around it, and every single conversation that I had didn't—I wasn't in the loop on this effort, and neither were the workers. Had I known, you would have had a demand to shut this plant down while we were doing what we needed to do, and to be prudent and use the language of the report, aggressive on how to handle this issue. So I feel personally violated in that sense that I was misinformed of what was going on in that facility, and I want to be very clear about that and put that on the record.

Mr. SHAYS [presiding]. Thank you. It is on the record.

I also want to say that I think the employees were extraordinarily tolerant. And the sad part of the story is that there isn't going to be the same trust next time, because you did have a lot of different people know about the contamination, and instead of voluntarily giving it to the employees when they requested the information, it was denied them. So it would—you would think that when you know this, you would say it.

And then you have an honest dialog, Dr. Hadler, that we don't quite know what this really means yet. That's fair. But Mr. Burrus's members are entitled to this information. But I think what is shocking is that when the request was made for information, it wasn't forthcoming. And I'm still trying to sort this out.

And I am going to give this back to Mr. Janklow to ask some questions, and then I'll have some.

Mr. JANKLOW. Thank you Mr. Chairman.

Dr. Hadler, when I read your testimony, sir, I get the feeling that there was no one person in charge of this investigation, if I can call it that. It was a committee put together from, if I recall, CDC, DPH—which I assume is the Department of Public Health—local health departments, liaison with the FBI in New York, liaison from the Postal Service in Connecticut, yourself. Are those the folks—was it being kind of run by a committee?

Dr. HADLER. It was kind of run by a committee where everybody's ideas were heard and discussed. The reality is there were probably sort of two points of leadership. And the two points of leadership were the Department of Public Health, and that was me and the committees, although reporting—I mean many times a day—to the Commissioner of Public Health and, as needed, the Governor knew about things and got involved, and then the CDC staff, one of whom from the CDC command center in Atlanta was listening in on all of our daily meetings, as well as the close-to-CDC staff that were present helping us.

Mr. JANKLOW. But that's a committee.

Dr. HADLER. It is a committee, but we all shared ideas and came to consensus on what to do, and passed information up and down

to our respective bosses who could certainly overrule us on anything that we were doing.

Mr. JANKLOW. In hindsight, if this were to happen again, God willing it doesn't, but if it were to happen again, would you have somebody that oversaw the whole thing, a person who would oversee it all, a top manager?

Dr. HADLER. Potentially. It is clear you need somebody to make a final decision if you need a tie-breaker. And I think in general with the people involved, we didn't need that. We were able to come to consensus and able to discuss information and we were able to successfully communicate up and down our chain.

Mr. JANKLOW. For example, did you all agree, the whole committee agree, that you would call it a trace amount? Was that a committee decision?

Dr. HADLER. That particular one wasn't a committee decision. I think that particular term came out when we were explaining the first positive findings, discussing them with the postal leadership, and our interpretation of them, and we got questions about, well, how much was really found, and then we described sort of trace.

Mr. JANKLOW. I assume it wasn't just the workers. The media, the public, the elected officials were all asking the committee how much is there? How much is it? Am I correct in my assumption?

Dr. HADLER. In terms of how much was it came out—it came out in our discussions, but then it came out again as we were meeting with postal officials outside the regular committee meeting to further discuss the findings and what they meant so they could be clear on what they meant. I think the term "trace," unfortunately, crept in early on, in part because we were asked, well, sort of how much; and we said "trace," in the sense that very low percentage positive and only a few colonies——

Mr. JANKLOW. Couple more questions, Doctor. As I read your testimony, on November 21—let me back up. On November 11, there was a sweep done—let me call it that—of the facility, an analysis done of the facility, testing done on the facility.

Dr. HADLER. That was part of the U.S. Postal Service——

Mr. JANKLOW. Only one mail sorting machine was examined. On November 21, there was another sweep done—I use the term "sweep"—analysis done, testing done in the facility. There were only six samples taken from mail handling machines. On November 25, there was another examination done of the facility. And there were only eight samples taken from sorting machines.

So what I am wondering is why weren't all the sorting—why didn't the committee think that it was important to look at mail sorting machines? Is there a way for mail to get through those facilities without going through a sorting machine?

Dr. HADLER. It is an excellent question. I think the initial two samplings were planned by the Postal Service, and they were broad sweeps, because a broad sweep potentially would have picked up if a Daschle or Leahy letter had gone through. At that stage, we didn't know if we were dealing with a new mailing or we were dealing with the residual of an old mailing.

Then, as those results came back negative, the next round of sampling that came back on the 25th, which was wet wipes and the first one planned by our team directly, it was decided to sample all

kinds of machines in there, including taking a few samples from the machine that sorted mail for her postal route. And a lot more discussion said—came to the conclusion that if this mail came in from outside, it really should have—who knows what machine it could have come in on, as Doctor Martinez pointed out.

We also decided that in reviewing what mail was in her trash, 80 percent of her mail was bulk mail. One of the machines, which hadn't been sampled at all before, handled predominantly bulk mail. So it was decided then to just go through all the mail sorting machines in detail.

Mr. JANKLOW. Do you know how many mail sorting machines there were, sir?

Dr. HADLER. Thirteen high-speed mail sorting machines. And the first time we actually——

Mr. JANKLOW. From your testimony sir, it doesn't appear that all 13 were tested.

Dr. HADLER. They were first tested on the 28th. Four of them were found to have positives. And then we went back to those four—actually three of them were found to have positives and one of them had a false positive initially that turned out to be negative. But we went back—as far as we found, that we took the machines off line and then thoroughly resampled them to try to get a better idea as to how contaminated they were, and that is where we came up to close to 70 percent of the samples——

Mr. JANKLOW. Were heavily contaminated.

Dr. HADLER. Right.

Mr. JANKLOW. I am not playing with words, sir, but this is all important. You can tell by the animosities and anguish that people have. You call it a heavily contaminated machine. Is that a fair phrase that could have been given to the public?

Dr. HADLER. Yes.

Mr. JANKLOW. The other thing I would like to ask you about is—on page 7 of your testimony, in your conclusions: The previous conclusions about risk to workers are unchanged by these findings——

Mr. SHAYS. Would the gentleman suspend a second? I am wrestling with a number of things, but your question surprises me. From your testimony it was a heavily contaminated machine. So walk me through your mind-set, your mind, as to what that said to you and what it said should have happened.

Dr. HADLER. OK.

Mr. SHAYS. The machine is heavily contaminated.

Dr. HADLER. There's two aspects of the interpretation. No. 1 is, what does this mean with respect to how one person in Connecticut got anthrax? And from our perspective it meant that this particular machine, one that sorted mostly bulk mail that was dumped, it looks like this could be the source.

Mr. SHAYS. That is one thing that tells you.

Dr. HADLER. From the public health perspective, you have to step back and look at the whole context. This machine was presumably contaminated since sometime in mid-October. We didn't know there was anthrax in Connecticut and had no reason to investigate anything until late November. More than a month had passed, not a single person had gotten anthrax. If this heavily contaminated machine hadn't produced any anthrax in a month, based on every-

thing we knew about anthrax and incubation periods, it was highly unlikely to produce any anthrax.

Mr. SHAYS. Walk me through that, though, because the anthrax spores—they don't lose their potency so quickly, so what makes you comfortable in saying that? They could be in 100 different places just at the right time for someone to stir up the dust and inhale it.

Dr. HADLER. And you are absolutely right. They don't lose their potency particularly. And if aerosolized, they could pose a threat.

Mr. SHAYS. So, having said that——

Dr. HADLER. So recognizing that they hadn't been successfully aerosolized to the extent of exposing anybody in the preceding month or so, and ordinarily we would expect people to get sick within a week of being exposed, as did the people in Brentwood and Trenton, that was one piece of information. The other was we hadn't found spores in our widespread sweeps, meaning which is unlike Brentwood and Trenton where they found spores widely throughout the facility, even with dry—actually, I think it was mostly wet swabs that were used. But they found them very, very readily and also found them readily with dry swabs in Brentwood. It didn't look like there was evidence that there had been widespread aerosolization, that these spores had gotten on the machine, that they weren't ones that were sort of heavy spores, if you want to call it that.

Mr. SHAYS. So you're saying that if they were on the machine as heavy, you just assumed they stay heavy.

Dr. HADLER. If this had been the first day—if we had no context to put this in and there had been no other anthrax cases, we would look at it very differently than knowing when contaminated mail had gone through and knowing that we had actually been living with this situation for more than a month and yet no one got anthrax.

I don't know how much of this has actually been published. We knew that New Jersey had found at least 10 different—at least 5 different contaminated postal facilities, using only 20 cultures scattered around the postal facilities. In the greater Washington, DC, area, at least 20 post offices had tested positive for anthrax.

Mr. SHAYS. What I am hearing you say is that this was a heavily contaminated machine. The machine was heavily contaminated, and you basically made a decision or reasoned that so much time had passed that if the damage wasn't done already, you didn't need to fear any damage in the future.

I am having a hard time sorting that one out, because we know that the spores can be dormant and they can be in certain places and they could be stirred up and so—anyway.

I thank the gentleman for yielding.

Dr. HADLER. Just the one thing about the stirring up or aerosolization of spores, again, if this had been happening over the last month, we should have seen people with anthrax at any time. We had also done nasal swabs on all the workers who had been started on antibiotic prophylaxis. Nasal swabs, if you had been heavily exposed to anthrax in the last few days, then for it—the inhalational form—then potentially some of those should have been positive, and none of those were positive.

So all of this went into our thinking. The other thing was that the postal facilities for more than a month had stopped using compressed air to blow out machines, which is really where I would have been very worried.

Mr. SHAYS. I was wondering about the people that might have gotten bulk mail in their homes. But notwithstanding however you sorted this out, there is a total agreement in this room, I believe, that the public had a right to know exactly what you found, and then you can give them your arguments as to why you don't think they need to be concerned. Is there any doubt in your mind that's got to be the practice?

Dr. HADLER. Absolutely. That has to be the practice. When—I mean this information was explained—our Public Health information was explained. It was ultimately up to the Postal Service, per their own agreement.

Mr. SHAYS. No. Let me just say that's where we part company. It seems to me you are the Public Health official. And it would seem to me that your job is to make sure they do it, and if they don't, you do it. And I would love to, when I have my questions, sort that one out with you. I'm sorry that I took so long in intervening here.

Dr. HADLER. I would agree with your last statement. I think in retrospect if we have to do this again, we will be sure that we are more directly involved in the communication to the workers.

Mr. SHAYS. Everyone needs to look Mr. Burrus in the face and tell him that directly. We all need to look at him in the face.

Mr. JANKLOW. Dr. Hadler, the fact of the matter is there are times when individuals don't want public health issues disclosed, but you have a responsibility to do it anyhow; isn't that correct? The classic example would be communicable diseases. You are notified that people have been exposed or potentially exposed and you try to run them down.

If I could be very brief with a couple of questions. Anthrax spores can live decades, isn't that correct? Matter of fact, they live in the ground, especially out in—they live in the soils in this country; am I correct?

Dr. HADLER. That's right.

Mr. JANKLOW. And it isn't just a matter of—where you said in your testimony the previous conclusions about risk to workers are unchanged, the real risk was when the spores were introduced and possibly airborne in the vicinity immediately around the machine and not now. Cutaneous contraction of anthrax comes in contact with the spore and not necessarily airborne; correct?

Dr. HADLER. That's correct.

Mr. JANKLOW. To the extent that a postal worker has any kind of cut or opening in the skin, to the extent they touch that envelope that has anthrax on it, there is a potential they could get cutaneous exposures.

Dr. HADLER. That's right. And my statement referred just to inhalation anthrax.

Mr. JANKLOW. The 94-year-old lady that died, do we know that it is inhalation anthrax that she died from?

Dr. HADLER. Yes, we do. That is sort of the way she presented clinically. An autopsy was done looking for other possible routes of

exposure to see if she might have had a skin lesion before anything else, or any gastrointestinal ingestion of spores, and there was no evidence of that happening at all.

Mr. JANKLOW. Recognizing that several of the witnesses here today have talked about the fact that if it's lying on a surface, as long as you don't maybe spray it with an air gun or disturb it that way, that it may—it kind of adheres to the surface. Has anybody ever speculated how this 94-year-old lady had a letter and ingested airborne anthrax? What did she do, blow it open?

Dr. HADLER. As I mentioned in my oral testimony, we did find a letter in the house of someone else, not that far from her but on a slightly different postal route, that had come through Trenton, NJ within 15 seconds after the Daschle or Leahy letter went through. We found that letter and went to the house. We repeatedly isolated spores from the outside of that letter, and not from the inside of the letter, and not from any of the mail that it was stored with. What we speculate is that she got some bulk mail that was similarly contaminated. She tore all her bulk mail in half like this before throwing it in her trash. And we speculate that in tearing it in half—your leverage is much better around your mouth—that some spores were released, she inhaled them. And in her case she was, as you heard before, she was one of the vulnerable people for whom many fewer spores were sufficient to cause anthrax.

Mr. JANKLOW. One last question.

Captain Martinez, in light of the experience that we have all gathered from the past from the incidents involving the Postal Service and the Senate buildings and South Carolina, I believe it was, where they had the incident down there, has CDC changed its protocols in terms of what local public health, local officials, local businesses, local anybody, should be doing when they come across positive—the way you test—let us start there—one, the way you test; and, two, the methodology with which you inform the public?

Captain MARTINEZ. I can address the environmental and analytical, and I am going to defer the public health coordination and liaison to Dr. Perkins. But yes, since everything we have learned not only from research but also our outbreak responses, we have since posted guidance on the CDC Web site that actually lists out strategies on how we think one should approach—first responders and public health officials, for investigating anthrax; how you would sample it, how you would interpret it. These are the methods we have seen that we think are appropriate, and those are the methods that we are working on validating in house as we speak.

Also we are working with our CDC through the laboratory response network to send out protocols so that we have a certain consistency with methods, analytical methods, amongst our public health labs that are out there, these State and city public health laboratories.

Dr. PERKINS. The current CDC recommendations for handling of facilities if an environmental positive is found continue to suggest, as they have since November 9, that alone is not an indication to close a facility, and that there needs to be additional consideration of the entire context of the situation, such as Dr. Hadler has pointed out.

I think two points are important to recognize. First, surface sampling provides a very incomplete picture of human health risk, and that there are two critical components that in no way measures. One is the potential for that particle to get up off the ground and get inhaled to the lung, so the aerosol capability of that particle; and two, a very critical characteristic is the particle size. So if that 3 million colony forming units can't get up off the ground and is not in the 0.5 to 5 micron particle size, it does not represent a human health risk for inhalational anthrax.

Mr. JANKLOW. How large were these in the Postal Service buildings?

Dr. PERKINS. We don't have technology or methods to measure, and that is a major limitation in building that bridge from surface sample results to human health risk.

Mr. JANKLOW. I don't quite understand you. You say it has to be smaller than 5 microns, yet we don't have a way to measure it.

Dr. PERKINS. We do have a way in the laboratory. And everyone has been referring to animal experiments indicating a certain range as infectious. Those are done in very careful laboratory settings where the particles that go into the animal are actually measured as they go into the animal.

The other thing is that we know of environments, including your State, where there is extensive environmental contamination; and there's people working in those environments that are not at risk for cutaneous or inhalational disease and, in fact, the bacillus anthracis that's present in those environments has to be amplified in an animal infection to present a risk.

So we know of other environments in the United States where people are working, you know, for the last 25 years in contaminated environments, that do not represent public health risk. So, you know, we are working from a basis of experience in making some of the kind of recommendations that Dr. Hadler referred to.

Mr. JANKLOW. Thank you very much. But those are nature-grade and not weapons-grade anthrax.

Dr. PERKINS. That's clear. But again, weapons-grade anthrax pertains primarily to the aerosol plume at the point of release. And these particles quickly become very sticky with electrostatic charges and attach to things and form particles that then do not present health risks.

Mr. JANKLOW. Thank you, Mr. Chairman.

Mr. SHAYS. Let me go through some questions. I can ask a short question, and the answer may be longer, but I am not looking for long answers.

Mr. Burrus, are workers still concerned about their health and safety at the work sites?

Mr. BURRUS. Yes. There is still a concern. And the concern is not—the residue of the anthrax attack is certainly lingering in the minds of employees, but I think the overall concern of their employees and their union is that, as reflected in much of the testimony today, we didn't suffer any illness and suffered no deaths beyond Brentwood. That is to put postal workers in the class of being guinea pigs. We don't know we have a serious problem until someone dies. The postal officials and the employees at Brentwood were told the same thing as—you know, the Leahy and the Daschle let-

ters occurred before Brentwood. Capitol Hill was closed. There were testing dogs. Brentwood remained open.

All the excuses that have been presented here today were given to the employees at Brentwood and Hamilton Township: So far, it's not weapons grade. It's dormant if it exists. You're safe.

We had the two deaths. The deaths generated the closing of Brentwood and partial closing of Hamilton Township. Subsequently we had the problem in Wallingford. We went over the entire process all over again. Nobody's dead yet, let's wait and see. The same information was given to the employees in Wallingford that was given to the employees in Brentwood: that it's safe, you can work, we'll contain it.

And it has not been contained. And I suspect that if it occurs again, I don't think the lesson has been learned. I don't think the message is clear that the health of the workers is paramount. And this adoption of the word "trace amount" to cover a multitude of sins, to give misleading information to the employees I think is wrong. And I think the employees, legitimately, continually have a concern for their safety and health and the protection they receive by those institutions who have the responsibility of providing them protection. Those are the legitimate concerns of the employees I represent.

Mr. SHAYS. It is very understandable that your employees feel that way based on what we have known before and based on this hearing.

Mr. Day, are you completely confident that all USPS sorting facilities are free of anthrax?

Mr. DAY. Well, I can state categorically I know they're not. We have the Trenton facility that is not yet cleaned.

Mr. SHAYS. On what basis can you make that statement?

Mr. DAY. We know that Trenton is contaminated and we have not yet decontaminated it.

Mr. SHAYS. How do you know the other facilities are not contaminated?

Mr. DAY. To the extent that other facilities may be contaminated, we did the extensive testing up front. There is the recommendation from the GAO that the Postal Service work with these myriad of agencies to reassess risk and determine whether additional testing would be required. We are very open to the idea and we fully embrace it. We'll determine what the risks are, where we potentially would need to go back and retest.

Mr. SHAYS. Let me ask you, how many of the USPS facilities were actually sampled for anthrax?

Mr. DAY. 211.

Mr. SHAYS. Out of how many?

Mr. DAY. We have about 380 processing centers of various types.

Mr. SHAYS. 211 were all processing agencies?

Mr. DAY. No. Some of those were actually targeted locations in the areas directly impacted in Washington, New Jersey, and New York, as well as Florida.

Mr. SHAYS. How many of the 211 were processed?

Mr. DAY. Just over 100.

Mr. SHAYS. You did 100 out of the how many processing?

Mr. DAY. There's roughly 380 that do some level of processing activity.

Mr. SHAYS. So the balance of 111 were postal offices?

Mr. DAY. Yes.

Mr. SHAYS. How many postal offices do you have?

Mr. DAY. 38,000.

Mr. SHAYS. How many of these facilities that were tested used exclusively the dry swab method?

Mr. DAY. First round of testing was all dry swab.

Mr. SHAYS. So out of all the facilities you did, the 211, did you only go first round, or did you do a second round not using the dry swab?

Mr. DAY. On our first round of testing we found 19 with the dry swab that had some level of contamination.

Mr. SHAYS. That is not really what I am asking. I am asking how many of these facilities were done with the wet swab?

Mr. DAY. Of the 211, they were all dry swabbed.

Mr. SHAYS. How many were done with wet swab?

Mr. DAY. The five additional ones that had more extensive contamination.

Mr. SHAYS. If you didn't get contamination with a dry swab, then you didn't do the wet swab?

Mr. DAY. Correct.

Mr. SHAYS. We had testimony that basically says the dry swab is kind of useless.

Mr. DAY. There's been discussions about going back and was there a need to go back and do additional testing, and the advice was no. Again, given the GAO recommendation, we will go back and look at that again.

Mr. SHAYS. Ms. DeLauro is rightfully asking—I might get a Baptist Church here, but her question is very important—by whom? Who advised you?

Mr. DAY. There was a discussion with our safety and health staff, with the same collection of agencies.

Mr. SHAYS. Postal people advising the postal people?

Mr. DAY. No, we sought outside help from.

Mr. SHAYS. Who told you that you do not need to do wet swab?

Mr. DAY. Let me not speak out of school because I was not privy to the conversation, but I can give you specifically who was involved in the conversation. We had a safety and health manager who was dealing with other agencies.

Mr. SHAYS. I have been doing a lot of listening, and I haven't done a lot of questions because I have been trying to sort this out. One thing that we in this committee try to make a practice of is not after the fact say, you know, it's your fault, because hindsight sometimes is very important. And I also try to put myself into the position of the time in which there was lots of pressures and lack of knowledge and so on.

But Mr. Burrus has been about as gentlemanly as you can be, and he's having to listen to this, having to represent his workers. And we have—I mean the testimony was pretty clear; the dry swab is pretty useless. So you have given me the impression that you really shouldn't have given me, that we have tested 211 facilities, because actually we have done it with the dry swab and that is

kind of useless. And I don't mean to put you on the spot, but you kind of put yourself there, because really what you should have said up front, disclosure in the spirit that we would want in the future is, you know, we need to say that we have done 211, but frankly those were done with dry swab and we only did about 5 with the wet swab; and, you know, we may need to reexamine how we go forward.

Now your response may be, you know, we haven't seen any deaths or injuries, which is kind of like Mr.—you are kind of adding to Mr. Burrus's comments of the guinea pig. No one died, so we must be all right even though we really didn't test these facilities.

Do you disagree with my conclusion that, based on the testimony we have had, that doing the dry swab is going to meet the need?

Mr. DAY. From what I heard today and the assessment of the dry swab, I can't disagree with you. We do need to go back at it.

Mr. SHAYS. I don't know what "back at it" means, but——

Mr. DAY. Congressman, basically we don't have microbiologists on the staff. We have truly sought out the best advice we can. If the advice of these agencies is that we need to go back and do wet swab, wet wipe testing, aggressive air sampling with HEPA to assure that the original 211 are truly clean as we first thought they were, then that's something we will do.

Mr. SHAYS. In the five facilities that you utilized the wet swab method, how many of those five facilities were found to have anthrax?

Mr. DAY. The additional testing was done in facilities where there was some preliminary positive.

Mr. SHAYS. When you think about it—this is almost humorous—in the five facilities that you did it, you actually found that you had a problem and you had anthrax in those five facilities, and the dry swabs found it, but the wet swabs——

Mr. DAY. We found it on multiple sampling types. So we found it on dry swabs, wet swabs, HEPA vacs. There was multiple sampling protocol. We also had 19 facilities with only dry swabs that were also found to be positive.

Mr. SHAYS. What happened? Did you go with the wet swab?

Mr. DAY. We did a pure dry swab and found out where it was and did a decontamination effort and then subsequent testing.

Mr. SHAYS. And you did the decontamination over the whole building?

Mr. DAY. We found very isolated results in certain buildings where it was very specific, and we were——

Mr. SHAYS. What you just told me, though, is that there are 19 facilities' worth of dry swab found anthrax, but the wet swab would give you a better reading and you didn't do that.

Mr. DAY. That's correct, at that time.

Mr. SHAYS. That's a little cause for concern here. What factors did you consider in deciding that retesting facilities would be not necessary? Cost, practicality, legal issues, political issues?

Mr. DAY. I would definitely rule out cost, political, and legal. The only thing we ever used in this process is advice from experts on what is necessary for the safety of employees. There is a risk as-

sessment that is done, and I think you heard that from some of the witnesses, and we followed the advice that they have given to us.

Mr. SHAYS. Who's they?

Mr. DAY. Again, it has been State public health officials, where appropriate, and CDC.

Mr. SHAYS. In my office, if everyone is in charge, no one is in charge; so I always assign someone to be in charge. And it is probably one of the best lessons I learned early on, because early on we discovered something we needed to do and it didn't get done, and I realized that everyone else thought someone else was doing it.

We have this case, CDC, the State officials, USPS, and it's like, you know, I want to know who ultimately is held accountable for this. And the answers that you give me when I don't—I'm not comfortable and I don't think you are comfortable with the decision is we were advised—they, we, sought out the best help we could.

So I just would tell you, I think this hearing is almost ripe for our committee to come up with some real quick conclusions as to, you know, who should be in charge of deciding protocol and practice and so on, who should decide to make sure that information is communicated. I really think that the postal department basically made a decision that the employees and the public couldn't handle the data, and you weren't quite sure what the data was, so you decided not only to not voluntarily provide it, but you resisted providing it when it was requested. I am uncomfortable that the State was kind of deferring to Postal to decide what should be disclosed and not disclosed, because I really believe this was a public health issue.

And, Captain Martinez, I want your reaction to what I asked and response to questions.

Captain MARTINEZ. Could you repeat the question, please? My mind went blank. I apologize.

Mr. SHAYS. I want to know what you have thought about the responses of Mr. Day, Dr. Hadler, the responses that were earlier in our first panel. I want you to help me sort out what CDC's role is. You know, there were people that knew that there was contamination at the site by CDC, and they didn't feel obligated to speak out, which is kind of amazing to me. So, you know, tell me how you sort all this out.

Captain MARTINEZ. CDC, when we respond to an investigation, we respond—as suggested earlier in my presentation—at the invitation of the State and local governments. We come to assist. We don't try to direct. It is not within our mission. We try to provide expertise, whether that be sampling, analytical, or epidemiological; and we try to work with them with the best advice that could guide their response with as much information as they can.

From the very beginning, I was deployed with Dr. Perkins to Florida, and we started delving into that realm of environmental sampling, which up to that point had not been done up for a biological agent or bioterrorist agent. And it was at that point in time that I contacted resources that I have through my experiences through mold sampling and my biological expertise, that we knew at that point in time that wet swabs were the way to go but perhaps were not the best way—wet swabs were better than dry swabs.

Mr. SHAYS. You have pretty sound reason to make that conclusion.

Captain MARTINEZ. It was based on a scientific paper and research.

Mr. SHAYS. If you see dry swabs used, you what, you are like a machine, you don't respond to it?

Captain MARTINEZ. We tried to reeducate where we could. And in Florida we were already using HEAP filter vacuums and wet wipes at that point in time. That message had been linked out to our other response teams on Capitol Hill, Brentwood, Hamilton, and, as you can see, a certain amount of consistency, even on Capitol Hill, we hit the ground with wet wipes and vacuums; and also the same is true of Brentwood as well.

Mr. SHAYS. Is your ultimate authority HHS?

Captain MARTINEZ. Yes.

Mr. SHAYS. Were you not aware of the challenge up in Connecticut where there was contamination but not yet made public? Were you aware of that?

Captain MARTINEZ. To be honest, sir, no, I was not. I was privy to some of the conversations in the conference calls because I was the liaison, if you will, with our contract laboratory. So I was aware of the data coming through.

Mr. SHAYS. Through the conference calls you were aware——

Captain MARTINEZ. Aware that the information existed, yes.

Mr. SHAYS. That there was contamination?

Captain MARTINEZ. Yes.

Mr. SHAYS. So was there in these conference calls a dialog that the public had a right to know and the employees certainly?

Captain MARTINEZ. I don't recall. Again I was not privy to all the conference calls. Maybe Dr. Perkins has a better perspective.

Dr. PERKINS. Speaking for my many colleagues at CDC, I feel confident that if there were scientists involved that recognized a clear increased risk to human health as a result of this particular finding, and informing the employees of that finding was a high public health priority, I would hope that those involved would have conveyed that.

I think the uncertainty here, and where things went gray, and it looks like where things went wrong with a loss of trust, was the importance of this to human health risk. Let me caveat that with saying that clearly I think disclosure with caveats is the way to go. And I think many people at CDC would agree—everybody would agree with that at CDC.

Mr. SHAYS. Let me ask this last question, and I will recognize Ms. DeLauro.

What legal obligation, and then what moral obligation, would someone at CDC have to make sure this is disclosed to the public if, in fact, it was determined that employees or the public were—could potentially contract anthrax due to a contamination? What kind of obligation exists? In other words, is it you just advise, or others who have this information don't speak out; is it a moral or legal obligation for CDC to speak out?

Dr. PERKINS. I cannot comment on the legal obligation but I can comment clearly on the moral obligation in that all of us in public health seek to do anything we can to protect populations, especially

like those served by Mr. Burrus. And that is, I mean that is why we are at CDC, and I know that Dr. Hadler feels the same way. That is why we are in public health. So I would answer your question that we feel the absolute strongest moral obligation—I don't know what the legal obligation.

Mr. SHAYS. Doctor Martinez, I would like a list of the people who were on those conference calls, and it is not, you know, to—I guess what I am not totally—and I thank you, Dr. Perkins, for your answer, because that is kind of what I would have hoped it would have been. But I am not convinced that we have a clear sense of obligation as to who would make sure this information is provided and who will be the backup if someone who is responsible doesn't do what their obligation is.

And I would just be interested to know, I would like this committee to know, and we can contact those individuals, as to what was being dialoged here and why did the system break down that employees weren't informed?

That also leads to the fact that once the employees request information, why do you still have trouble getting it? It's bizarre.

Captain MARTINEZ. I think it's important to recognize as well, and this was suggested by Dr. Hadler, that there was much involved in the decisions that were made in that point and that had to do with before the quantitation results were even out that particular machinery was isolated with polyethylene and at that point in time——

Mr. SHAYS. I think this is all important, but there were people who worked with this machine. And these are people who might have been exposed, and they had—and even though you want me to know that, it makes me feel uneasy because it seems like the counter, and there's counter to the fact that the employees needed to be informed.

Captain MARTINEZ. I wholeheartedly agree that the employees should have been informed of all the information, and I think CDC supports that as well, with the exception of that quantitative result. And what we said in our briefing is would that have made a difference in the recommendations that were made to those employees, no. Whether it was qualitative or quantitative, we still would have recommended that the equipment be isolated, that it be remediated. The prophylaxis was recommended to be continued. These public health recommendations would not have changed.

Mr. SHAYS. If you had been one of those employees, would you have been absolutely outraged you were not notified?

Captain MARTINEZ. I agree, sir.

Mr. SHAYS. That says a lot.

Ms. DELAURO. Just as a follow-on to the phone calls. I truly would like to know who was on the phone call when the decision was made not to provide the workers the information. There is lots that has to do with the health considerations, what the scientific discoveries were, but who made that decision? Was Postal Service on the phone, was CDC on the phone, was OSHA on the phone, was the Connecticut Department of Health on the phone? Who was on the phone that made the conclusion that said when the requests came for the data, that the decision was, we are not going to pro-

vide the data? If there's an answer now, that's fine, and if there isn't, I would like to know who was there to do that.

Further, if you look at pages 16 and 17 of the GAO report, when we did find the heavy contamination that—and it goes back and forth here, although we're told no documentation exists about the advice the Postal Service received at the time, according to the District Postal Manager, the Chief Epidemiologist informed them that there was an additional risk to employees for the same reasons previously cited. And you all have talked about these areas in which you would not have said that, and that CDC concurred, CDC concurred with that assessment in terms about the risk.

The other piece I asked Captain Martinez a bit ago, is one of the reasons for the lack of disclosure of the information to the workers that we could not validate? Now, the fact of the matter is that we could have validated, but we had a backlog, at least in terms of that. So we waited several months until September to get information to people, and we would not disclose any information to them, and we said we could not validate it when, in fact, we had that facility to validate this and to do it, to say this takes precedence.

We have a problem here. You may not be able to do it in the run of the course or do every building, every facility, but you had a specific problem in Wallingford. So you cleared the decks and you validated, so that, in fact, you may be able to provide the relevant information to the people who work there, especially after having been asked on several occasions. So that we really shut the door amongst the various agencies that were engaged here of taking the course of least resistance. That's not appropriate, and I think we understand that, and I honestly do believe that you understand that now, but we can't afford to put people at risk in this way.

We're charged with a responsibility, each of the agencies were charged with the responsibility to do what's in the public's interest, and I venture to say that the public's interest and the worker's interests were not not served, but poorly served, and as I said in my opening remarks, we lucked out and you know, Mr. Burrus is right, it's not understandable. It's not understandable.

Thank you, Mr. Chairman.

Mr. SHAYS. We're going to close up here. Governor Janklow, do you have any comment you'd want to make?

Mr. JANKLOW. Sure, if I can Mr. Chairman. I'm going to be brief.

As I listened to the testimony today, and I really appreciate you, Mr. Chairman, I really appreciate you calling for this hearing and all of the witnesses that you and your staff selected to bring forth. It's been a good discussion. I think some things are pretty clear. As I said before, I wear trifocals, but my hindsight is 20/20. We in America talked a lot about being prepared before a lot of these things happened, but it was really talk in a lot of respects. We have unusual problems in this country because we have thousands of governmental jurisdictions. We have 18,000 law enforcement jurisdictions. Between city health departments, county health departments, State health Departments, the Federal Government, only the Lord knows how many there really are.

This, to me, isn't done like what's happening in China recently. They have problems with SARS. They really didn't want to tell anybody too much about it because they did not want to panic ev-

erybody. They thought they could keep working and move forward though in trying to deal with it. When I was younger in life, when somebody was terminally ill, the doctor told everybody but the terminally ill person. They used to explain to them that grandma is not going to make it but they never told grandma. Yet grandma's the one that needed to know because she had decisions to make.

As we look back, this is a first time event for all of us, and as the chairman said, I'm not interested at all in assessing blame as much as I am what have we learned from it. Cicero once said to be ignorant of the past is to remain a child, and I believe it was Santayana who said a Nation that does not know history, is fated to repeat it. We know history. So we shouldn't be fated to repeat it.

Mr. Chairman, one, we need to figure out, as one of the witnesses said, who's in charge at the national level and at the local level. This can't be run by committee, by consensus and by majority vote. There has to be someone that makes the decisions very rapidly every step of the way. We don't have a lot of time. This isn't like making decisions about your future as to what course you ought to take next semester. This is a decision you make on an hourly basis, an instantaneous basis.

In addition to that, I think OSHA has learned from this. Were it to be done again, they'd probably treat the Postal Service like they would any other private business, probably been a lot harder on them and should have been. I think CDC has learned a lot from this. The reality of the situation is, you, Captain Martinez, said it so well, that you work with the local and the State governments, and it's always been CDC's role to try and not push the envelope but to respond to requests from locals, but in the world of terrorism where folks are out there deliberately trying to hurt other people, it's different in the way that God used to kind of spread diseases and sicknesses around. So you may end up having to be proactive and more authoritarian, if I can use that word, than historically you've been, even at the risk of alienating these quasi-sovereigns that are out there in what we call the United States of America, and we really have too many cooks in the soup and nobody in charge.

And so this has been terribly enlightening for this particular Congressman. Only because all of us together, I think, by discussing it, I think the end result is the Postal Service, if and when it were to happen again, would be far more proactive. Their workers will be involved on the front page instantaneously, that arm in arm, as the testimony indicated you all like to do it, is the way it will be done in the future.

Centers for Disease Control will be far more up front, and clearly is today, and the State health departments will be far more proactive. The net result is that I think that our people are better protected, but they're not yet protected.

And so I thank you, Mr. Chairman, for these hearings and to the extent that, the one thing I didn't ask but usually ask witnesses is, if there something that any member of the committee that thinks we as a Congress can do to help facilitate and improve in the process, and so I'd just ask that any committee member that has any insight——

Mr. SHAYS. Any of the people here?

Mr. JANKLOW. Any of the witnesses, if they'd send that to us, I would certainly appreciate it. But thank you for this hearing, Mr. Chairman, and thank all of you for your straightforwardness and candor.

Mr. SHAYS. I thank the witnesses as well, on both our panels, very helpful. Obviously, I thank my colleagues on the dais here who asked excellent questions, as I listened to their questions and to the responses.

Is there anything that any of the witnesses want to put on the record before we adjourn? Is there anything that you might have thought about last night that you knew needed to be part of the record, any comments here?

If that's the case, let me before adjourning, before ending this hearing, thank Joseph McGowen who was a detailee to the subcommittee from the Department of Labor's Office of Inspector General. We appreciate his work in this effort, and, obviously, the work of the committee on both the majority and minority side.

I thank all of you for your service to your country and community, and we'll learn from these experiences and do a better job.

And with that this hearing is closed.

[Whereupon, at 5:10 p.m., the subcommittee was adjourned.]