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ROUNDTABLE ON PUBLIC HEALTH PREPAREDNESS IN THE 21ST CENTURY

HEARING

OF THE

SUBCOMMITTEE ON BIOTERRORISM AND PUBLIC HEALTH PREPAREDNESS

OF THE

COMMITTEE ON HEALTH, EDUCATION, LABOR, AND PENSIONS

UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

SECOND SESSION

ON

EXAMINING PUBLIC HEALTH PREPAREDNESS IN THE 21ST CENTURY, FOCUSING ON A NATIONAL PUBLIC HEALTH INFRASTRUCTURE WITH REAL-TIME SITUATIONAL AWARENESS, AND RESPONDING TO THREATS BY TERRORISM OR NATURAL DISASTERS

MARCH 28, 2006

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ROUNDTABLE ON PUBLIC HEALTH PREPAREDNESS IN THE 21ST CENTURY

TUESDAY, MARCH 28, 2006

U.S. SENATE,
SUBCOMMITTEE ON BIOTERRORISM AND PUBLIC HEALTH PREPAREDNESS OF THE COMMITTEE ON HEALTH, EDUCATION, LABOR, AND PENSIONS,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:04 a.m., in Room 430, Dirksen Senate Office Building, Hon. Richard Burr, chairman of the subcommittee, presiding.

Present: Senator Burr.

OPENING STATEMENT OF SENATOR BURR

Senator BURR. Good morning. This roundtable will come to order. I want to take this opportunity to welcome everybody here this morning, most importantly the panels of witnesses that we will have. I am sure we will be joined on and off by other members of the subcommittee and full committee as we go through.

As has been the practice of this subcommittee, it is extremely important for us to get as much testimony on the record as we try to prepare for the reauthorization of the bioterrorism bill and as we continue to develop a blueprint. This is another in a series of hearings and formal roundtables that we will have to have in exchange of ideas for members and for staff to hopefully guide us on the way.

This roundtable is an important part of our discussion as we move forward to reauthorize the Public Health Security and Bioterrorism Preparedness Response Act, legislation that was passed in 2002. It moved the country in the right direction, but as we have seen from the effects of Hurricane Katrina, it has not done enough. Katrina exposed an unstable public health infrastructure at all levels of government during an emergency event.

The Public Health System that I envision for the 21st century is a robust partnership between Federal, State, and local levels and is flexible enough to prepare for and adequately respond to disasters such as Katrina. As you all know firsthand, the response to disasters begins and ends at the local level. It is our responsibility at the Federal level to ensure that every local public health department has the capacity to protect the health of its citizens and that Federal resources are available to draw upon as needed.

Additionally, we need to think systematically about how best to address situational awareness, including surveillance systems, epi-

demic monitoring, and reporting risk communication and health threat alerts, as well as laboratory and hospital reporting.

Regarding a competent workforce, we need a national strategy for developing a prepared workforce and how to best recruit, train, and retain public health workers. We also need to exercise our plans regularly. We need to ensure security and preparedness through science-based strategies and public health research. The task before us is difficult, but it is not impossible.

Five decades ago, when President Eisenhower contemplated the need for national commerce and defense, he created the National Highway System. Our task today is similar. For the purpose of our national public health and defense, we need a national standardized Public Health System to promote general public health within and between the various States and enable the investigation and containment of disease, including defense against biologic, chemical, and radiological attack.

I look forward to hearing from each of you regarding your insights. I know that we have a number of different perspectives. Please know that we will use what you tell us in this committee, and attempt to make the necessary changes to improve our national Public Health System so that the response to the next health emergency is better than our experience with Katrina.

I will make sure, by unanimous consent, that the record is left open so that members who read the transcripts but don't have an opportunity to be here can also submit questions, and I hope all of our witnesses today will make themselves available for the answers to those questions.

At this time, it is the chair's prerogative to recognize Dr. Richard Besser from CDC, who is the Director for the Coordinating Office for Terrorism Preparedness and Emergency Response. Richard, it is a delight to have you here today and I recognize you.

STATEMENT OF RICHARD BESSER, M.D., DIRECTOR, COORDINATING OFFICE FOR TERRORISM PREPAREDNESS AND EMERGENCY RESPONSE, CENTERS FOR DISEASE CONTROL AND PREVENTION

Dr. BESSER. Chairman Burr, it is a real pleasure to be here today. I want to commend you and the committee for taking on such an important topic as public health preparedness. I am the Director of the Coordinating Office for Terrorism Preparedness and Emergency Response at the Centers for Disease Control and Prevention. I assumed this position on August 29, the day Katrina hit, and in that regard have had an opportunity to see a lot of the strengths of the system, but also many of the gaps.

At CDC, we take an all-hazards approach to preparedness and response. We agree that having systems that are able to respond to a hurricane such as Katrina will also leave us with the systems that we need to be able to respond to everyday public health events as well as manmade events related to terrorism.

My office at the CDC has overall responsibility within CDC for preparedness and response activities, so that involves the strategic direction across the agency, allocation of resources, of linking our budget to accountability, and then serving as the point of contact

to stakeholders within the government and outside groups around the area of preparedness and response.

All of our activities at CDC in the area of preparedness and response are linked to nine preparedness goals that deal with issues of prevention. Clearly, preventing the consequences of natural disasters or preventing terrorism is the best public health intervention that we could make. Detection and reporting, making sure we are able to detect events quickly and determine whether or not they are manmade or natural; investigating events, having the systems in place to rapidly go out and determine the scope of an event and determine the control strategies; implementing those control strategies; and then assessing what more needs to be done; recovering from an event; and then learning. It is essential that our systems that are in place have the ability to look back and see what worked well and implement that as an ongoing practice and look at what did not go so well and correct that.

I don't have any more formal comments to make and am happy to answer the questions that you forwarded or other questions.

Senator BURR. Great, Richard. Thank you. Thank you so much. Clearly, you sit in a very pivotal spot at CDC relative to prevention or preparedness and response, and I think that sometimes we forget it is the Centers for Disease Control and Prevention. I think we need to make sure that everybody over at CDC as well as us up here gives the full name in the future.

Can you explain how the Biosense program works presently and how it interacts with the local public health departments for their situational awareness?

Dr. BESSER. The issue of situational awareness is key. It is essential. When you talk about situational awareness, it is the simple concept of knowing what is going on on the ground, knowing what your current public health situation is, knowing the health status of your community, being able to detect events early, so there is a component of early event detection, and then being able to follow an event as it unfolds in your community.

So, for example, each year with seasonal influenza, it is very important that we have systems in place that are able to determine when it arrives in the community, how it progresses through the community, who is affected by that, and then as it moves through, what other populations are going to be affected.

There is an acute awareness that when it comes to public health emergencies, and even every day public health, there is a need for real-time data. You need to know what is going on at the moment. And Biosense is an attempt to try and implement a national system that will give us both early event detection as well as ongoing ability to track events. Biosense is a partnership between Federal, State, and local government. It is a partnership with local hospitals. It is a tool that I think will be very effective for use at all of those different levels.

The current status of Biosense—it began with the ability to analyze not real-time data, but data sets looking at encounters. So it is able to look at data from the Department of Defense and VA clinics. It is able to look at tests that are ordered from one of the largest laboratory companies in the country whose able to look at poison control data. And what it does, by analyzing that data over

time—getting the data is only the first part. Once you have the data, you need to be able to analyze that and look for trends. You need to be able to analyze that and look for something new that we call aberrations. And what you want to be able to do is, if you see these blips or aberrations or something new, you need to have a system in place to be able to investigate that quickly.

Now, public health is local, and so the key to that investigation has to be on the ground. It has to be with the local health departments. So the way Biosense is structured, this data flows up using existing data systems. It taps into systems that are in place in hospitals and clinics. This data flows up through a large data pipe and is then ready for analysis simultaneously at the local—at the hospital, local, State, and Federal levels.

At CDC, we are in the process of standing up and expanding a bio-intelligence group, Bio-Intelligence Center, and what that will be doing is learning as we go, but analyzing this data as we come in so that we are able to use it for everyday public health needs as well as for future events. We envision—currently, there are 10 localities that have real-time data flow coming to CDC as well as their own use and the goal is that by the end of 2006, an additional 21 localities will be on board. And when you say a locality, there is more than one hospital in a locality that is participating in the system.

You can envision a situation where the entire country at some point is covered by real-time data systems.

Senator BURR. When is that point? What is that date?

Dr. BESSER. Well, you know, I can't give you a date on that and I think it is important that before we decide on the level of expansion of that system, we evaluate as we go along and we determine what are the key components, what is the scale that you need to be able to do both early event detection and situational awareness, and then scale it up accordingly. If there are existing systems in place, we need to work to continue to incorporate the data that is coming from those systems into the Biosense system.

Senator BURR. Is the inability to lay out the timeline effecting our ability to evaluate what we are trying to do and how effective it is? Is it funding? Is it challenges that need to be addressed legislatively? Is there anything you can put your finger on?

Dr. BESSER. I think that we have learned a lot from the system so far, and this year is going to be a critical year. As we have more real-time data flow coming in, we will be able to get a better sense of what an appropriate time table should be.

I am very excited. I am in charge of our Division of Emergency Operations and our Emergency Operations Center, where we are putting a hub of Biosense linked directly to our Emergency Operations Center so that information that is coming in through Biosense will be able to help us during an event. So, for instance, during a large hurricane, we will be able to get Biosense information, if those systems are still flowing, right into our Emergency Operations Center. We are looking to build within that same surveillance-evaluation unit a hub for our global disease detection system, which is a network of centers around the globe that will be able to provide us with situational awareness from parts of the

world where it is very difficult for those countries to provide that information.

Senator BURR. Post-911, I think we were shocked to wake up and look for the first time, I think in quite a while, at the public health infrastructure in this country. We found that we did the bioterrorism bill that—correct me if I am wrong—about two-thirds of our public health infrastructure was not electronically connected to the Centers for Disease Control and Prevention. Are we 100 percent connected to our public health infrastructure today?

Dr. BESSER. When we talk about connectivity, there are different types of connectivity. There is the Biosense type of connectivity that I was talking about, where you are having encounter data, clinical encounter data from those locales coming in.

The other type of connectivity has to do with communications, and yes, we are there now. We have a system in place where we have a number of tools. We have something called the EPI-X, which connects the CDC and local health departments and State health departments around the country. It is a system that we use to alert States and locals of outbreaks taking place across the country. It provides forums for those entities to speak with each other. So that is an important part of connectivity.

Senator BURR. And that exists nationwide?

Dr. BESSER. That is a nationwide system. I can get you information in terms of the numbers of State and local health departments that are on board with that. It is a system that is continuing to expand, and as we identify appropriate partners, I think there is more we can do to build that out.

We also have a system called the Help Alert Network, which is a system, as well, for alerting States and locals of emergent health events. It is a system that health departments, State health departments are using to alert clinicians in their community as to events that they need to be concerned about.

So, for example, last month, there was a case of inhalational anthrax in Pennsylvania. The EPI-X system was used to alert health departments to this. The HAN system was used to alert doctors and emergency rooms so that they would know to look for additional patients if they were presenting.

Senator BURR. And as we both know, isolated area gives us tremendous latitude as to how we can focus on the threat presented with one case of anthrax. We are at a point in time that pandemic flu is the most talked about threat that exists around the corner, enough so that part of the supplemental funding will be used to accelerate Biosense. Share with me, if you will, the description of how you see those additional funds being applied to the Biosense program.

Dr. BESSER. You know, as you mentioned, Senator, there are significant resources coming for—that have been given for pandemic flu preparedness. We are putting money to State and locals for their preparedness activities, money for the Strategic National Stockpile, and resources to expand the Biosense system.

Biosense, as I mentioned, is a tool for situational awareness, and while it would be unlikely to be the tool to identify the first case of pandemic flu, it would be a system that would allow us to track

in areas that are connected electronically, track cases as flu could potentially spread across the country.

You know, the key to detecting the first case of most diseases is people. I think it is very important that, as we talk about Biosense, we don't forget that the most essential piece of our public health system is the personnel, making sure there are people there at the clinical level who know what to look for, making sure that there are trained, skilled public health professionals who understand what that means when they get a call from a hospital or clinician, know how to investigate that, know how to work with people on the ground in other disciplines. These are the real building blocks and fundamentals of our public health system.

Senator BURR. Today, the reality is that our public health infrastructure has a different face, depending upon which community you go into. Some mirror what I think we would suggest should be the face of 21st century. Others for a number of reasons might be no more than a vaccination point for low-income children. How did we let it get to this point and how long will it take for us to bring that level of expertise across the board?

Dr. BESSER. Senator Burr, that is a great question. I think how did we get to this point is a tough one to answer, but it is clear to me that there is not the constituency there for prevention that there needs to be. The vast majority of work that a public health department does, you don't see unless they are doing it poorly. You don't see outbreaks of pertussis, whooping cough, diphtheria. You don't see outbreaks of tuberculosis because they are doing their job. When you are not seeing those, when those aren't coming to the forefront, there isn't always the resources there at the State and local level to maintain them.

I think that the investment that we have seen over the past 5 years in our public health system has been dramatic. It has been extremely important toward rebuilding our laboratory system, rebuilding our epidemiological capacity. These building blocks for emergency preparedness and response will leave us in much better shape for all of the work that public health does.

Senator BURR. Do you envision a public health infrastructure that is, in fact, the entity that should be in charge of a public health emergency in a given community?

Dr. BESSER. I think that the question of who is in charge is dependent on what the event is. I think that we are moving in the right direction in terms of implementation of the National Response Plan, implementation of incident management systems around the country. There is a lot of work going on to train people so that they understand their roles and responsibilities.

I think more important than who is in the driver's seat, who is in that primary seat, is do we know what we are going to be doing? Have we exercised our roles and responsibilities for an event? Do we know how to work across other sectors? Do we know how to work with police and fire? These are very important things for us to work on.

CDC feels this is very important and is working to develop training courses in what we call meta-leadership. This is based on a training program that CDC and others have developed with Harvard in meta-leadership. It focuses on the tools you need to be able

to work across sectors. How do you work with not just other sectors of government, but with the business community so that we all understand what we are going to do during a response.

Senator BURR. I commend CDC for the progress that they have made, but just based upon your numbers, 31 localities have yet to be defined online in a year with Biosense. If, in fact, human-to-human transmission of pandemic flu is 6 months down the road versus a year, if it chooses to go outside of those 21 localities, which the likelihood is it will, or if there is another natural threat right around the corner behind this one, what ensures us that we are going to build out a model versus continually trying to respond to these isolated threats that seem to come more often now?

Dr. BESSER. You know, I——

Senator BURR. I understand what you said about the specific type of threat dictating what the decision might be, as to who is in charge, but I have a difficult time understanding how the one entity that you have control of, that you have input in, and that you have said, "this is the entity we need to drive real-time data to," is not automatically the default person in charge, that somebody else might trump them by a decision that somebody has made about the type of threat, and the likelihood is they are going to make a decision not knowing the community whatsoever.

Dr. BESSER. I think it is essential that whoever is in charge, public health is at that table and is providing the appropriate input——

Senator BURR. I agree with you, but if public health was at the table equally today, we wouldn't have the disparity between some of them. The reality is that the health care delivery system invites public health to the table to do what they perceive public health capable of doing. The disparities that we see—[ringing microphone]—clearly, I am in an area where somebody doesn't like me.

[Laughter.]

Clearly, we can't have that range of disparities in the future. Hopefully, you would agree on that.

Dr. BESSER. Yes, I definitely agree on that. You know, I think that we have some gaps—you can look at some systems and say, "This system is broken. This really isn't working well." But we do have a lot of gaps in our ability to measure state of preparedness of our systems. One of the issues that is on the agenda today to talk about is areas of research, and I think one of the areas where we really do need to support research is in the ability to measure preparedness, determine where we are, determine what the gaps are so that we can say, "Here is where the investment should be going. Here is where the system is broken and here is how we can use our resources in the best way to move forward."

Senator BURR. Well, in a simplistic overview of the Gulf Coast, what we found was that one State chose to use Federal resources to enhance their surge capabilities. Another State chose to use their Federal resources to actually put together a plan and to practice that plan. The devastation was similar. The challenges of the flood in Louisiana were unique to Louisiana, but the response between two neighboring States was incredible from the standpoint of how the one that practiced response responded and how the one who put the resources into surge and, in fact, couldn't use that

surge capability had not necessarily focused on the plan and the preparation.

I might say that they did exactly what the Federal Government asked them to do with the money. It was actually Mississippi that went outside the box and said, "no, this is what we need," and they were willing to invest in it and to spend the time and, in fact, they were the right ones.

What are we doing to track disease internationally and where should we direct our resources in regard to that?

Dr. BESSER. The issue of disease tracking globally is a very important one. CDC participates in networks with the World Health Organization. They have a global response network that CDC and the Federal Government participates in.

CDC is also building a network called Global Disease Detection, and the vision of this is to have highly-trained regional laboratories in all of the WHO regions so that we are able to provide advanced laboratory diagnosis in those settings, we are able to have personnel who can train others locally to do investigations so that we are able to detect more. This is one part of a strategy for gathering situational awareness globally.

Currently, CDC has an International Center for Emerging Infectious Diseases in Thailand, in Kenya, and is establishing one in Egypt. The goal would be by the end of 2006 to have five of these, with an addition of one in Guatemala and one in China. It is very important that we continue to foster the open participation in data sharing by countries around the world, and I think that the CDC is particularly well poised to be able to provide scientific expertise to countries so that there is an understanding that sharing information about a disease outbreak can lead to faster control of that outbreak and can mitigate some of the economic consequences that we have seen from things such as SARS.

Senator BURR. Globally, these are CDC facilities?

Dr. BESSER. Those are CDC facilities. They are done in partnership, though, with the national ministries of health. In Cairo, it is in partnership with NAMRU, the naval facility. We are also working with the Department of Defense to get information that they have on the health of troops in various parts of the country. With the number of U.S. personnel stationed around the globe, this can be, again, another way of identifying a site where a sentinel event may occur. We are in discussions with business.

Global business has the ability to know what is going on with their employees around the world and where diseases may be cropping up. That is another surveillance tool. And our Division of Quarantine has a network of travel clinics around the world which might be a place where a patient with an exotic disease would be presenting, again, a potential sentinel for a disease event that we might want to keep out of our borders.

Senator BURR. CDC uses accredited labs across the country to do work so if there were the fear of a biological or chemical attack, that the local lab could run the tests. However, CDC still requires a sample to be flown to Atlanta before they send out an alert because they believe that it is the only place they can be assured of the validity of that test. Is that an accurate statement?

Dr. BESSER. I would not take that as an accurate statement. There are quite a number of laboratories around the world that provide high-quality——

Senator BURR. I am talking about the domestic network that we set up.

Dr. BESSER. Excuse me?

Senator BURR. I am talking specifically about the domestic laboratory network that we set up.

Dr. BESSER. Oh, the Laboratory Response Network?

Senator BURR. Correct.

Dr. BESSER. There are certain tests that are only run at the laboratories in Atlanta, but there are—the Laboratory Response Network, one of the major advantages of that is that it provides high-quality standardized assays around the country.

Senator BURR. It is my understanding that their results today would not necessarily trigger a regional or national alert, that wouldn't be done until the test had actually been done again in a CDC facility in Atlanta. If I am wrong on this, I am wrong and you can correct me. I guess my comment would be, isn't it disingenuous that we are having some conversations about doing things in real time, yet we have got some paradigms in place that don't allow us to trust—[ringing microphone]. It is just a magnetic personality on the part of Dr. Besser.

[Laughter.]

That doesn't allow us to trust the assets that we have got out there, and I would only ask you, if we really want to do things in real time, if that is such an important step, and I believe it is absolutely vital, especially for the unknown in the future, don't we have to be willing to trust the labs that we have accredited?

Dr. BESSER. I agree with you fully, that the value of the response network is greatly diminished if we are not going to believe the results that come out of that network. You know, I would be happy to address any specific examples that are of concern.

With, for example, the Pennsylvania anthrax event that took place recently, it was essential that the islets get to Atlanta for different testing, the sorts of testing that we could do in Atlanta that aren't done at the regional labs, or we can compare the strain of anthrax there with other strains to determine, is it most likely a laboratory-based strain which might indicate something more likely to beg a terrorism event, or is it a wild-type strain? We are able to do testing to determine what antibiotics could be used to treat that strain. Those are not assays that are available at the other end.

So from my perspective, you have things going in parallel. You have the LRN, which is identifying that, which triggered the response, and I think quite appropriately, but we at the same time moved to get that islet as quickly as possible down to Atlanta.

Senator BURR. I certainly understand the need to mine down the sample to learn as much as we can. I just believe it is vital that we not delay notification because we haven't physically done the test in Atlanta, and clearly one would want, even before you have mined it, to put out an alert, if you know there was an anthrax attack.

You mentioned CDC's role in workforce training through the EIS program and the meta-leader courses. How many State and local public health officials get trained in these programs and what is the capacity to expand these programs in the future?

Dr. BESSER. The EIS program—I am a graduate of Epidemic Intelligence Service. That was my entry into public health. It is the entry point for a lot of people who go on to leadership positions in Federal, State, and local public health. There are roughly 60 to 80 people who are trained, who enter each class each year. It is a 2-year applied field epidemiology training program. I don't have the statistics in terms of how many of the people at State and local levels came through the EIS program, but that is something we would be able to provide.

The program itself though, just with those very numbers, is not the way that we are going to be able to achieve training of our entire public health workforce. Currently, with the preparedness funds that CDC receives, we fund 52 Centers for Public Health Preparedness. One of the main functions of these Centers for Public Health Preparedness is to try to link together academic universities and schools of public health with State and local public health practitioners.

It has been recognized that there is a real gap, that there hasn't been as strong a tie as there should be between the academic public health community and the applied public health community, and the Centers for Public Health Preparedness is just one way to try and bridge that, by providing training on the ground, developing certificate programs in preparedness so that there are set skills that are accepted that people should have if they are going to be practicing in public health.

Senator BURR. Well, clearly, that is a partnership that we need to focus on and expand because that is the next generation of our public health infrastructure, which are the workers that potentially come out of that academic surrounding.

Our Nation has been expanding our capacity to research existing and emerging biologic threats, including biosafety Level 4 labs. We have a limited number of researchers with the expertise to work in those labs. What steps can we take to ensure that the research at these labs are safe and the highest quality possible?

Dr. BESSER. Chairman Burr, the CDC has a very important role in terms of making sure that the individuals who are working in these laboratories are appropriate and that the procedures that are followed ensure safety. The Select Agent Program is one of the divisions located in my office, and the Select Agent Program is responsible for working jointly with the Department of Agriculture and the Department of Justice to ensure that individuals who are working in those labs have the appropriate clearance and for developing standards for how agents should be handled by individuals working in those labs to maintain the safety of the individuals and the security of the agents.

Senator BURR. I remember when we did the Select Agent Program. I remember very vividly that the CDC did not want that program housed at CDC. I won't ask you for your preference today, but I would take for granted that we are in a much better situation

today than we were in 2002 when we passed the legislation and gave CDC the responsibility, is that a fair statement?

Dr. BESSER. I think that is a fair statement. I think that CDC is committed to making that program successful and I think that since its implementation, the safeguards that are in place are making the country much safer.

I think that one of the challenges that we now face is putting in place mechanisms for appropriately sharing the information on Select Agents with trusted agents in each State health department. It is very important if we are going to hold the locality responsible for preparedness that they know whether or not there is a laboratory in their locale that is working with an agent so they can have response plans in place, and we are committed to working to achieve that in a safe way.

Senator BURR. Great. Again, I hope that you will make yourself available to any questions that staff or members, in addition to what we have had this morning, provide to you.

I am going to end with a statement and not a question. As I said earlier, we have got a mighty big task in front of us, one that will require a level of cooperation between DHS, HHS, CDC, all the partners, quite frankly, all the public health entities across the country regardless of how big or small the locality that they might be in.

I think if one looked at the progress that we have made, I am not sure where the grade would be. The passion has certainly increased in the past 6 months about the need to get this done, I think in large part because of the fear of pandemic flu. Having just come off of Katrina and having had the opportunity to see what worked and what didn't work, I would hope that disaster would give us a degree of passion. I would have hoped after September 11 that the concerns of chemical, biological, and radiological attacks would have given us the passion to go at a much faster pace.

I am not concerned with what the trigger is that forces us to finally design what the 21st century should be from a standpoint of us addressing all threats and potential attacks, be it deliberate, natural, or accidental, but I am confident that we have got to have willing partners, and for the role that CDC will play in that and specifically your leadership there, we are grateful for your insight. We are grateful for the passion that you bring to that job. I encourage you to be a full partner in this process as we go through trying to design the blueprint for the future. It will, hopefully, address the needs that we have for the threats that we know about today.

The question is, are we smart enough to design a template that enables us to address the threats that we don't know about for tomorrow. I believe we can do that, and I believe that we owe it to the American people to do it. But again, it will take a leap of faith on the part of all of us to find the common ground that puts us there.

Thank you for your testimony today.

Senator BURR. At this time, I would like to call up the second panel. I will wait for them to come up to introduce them individually.

If everybody has gotten settled, I understand that the structure for this part of it is that we have submitted questions to everybody

and that rather than extend the opportunity for a lengthy opening statement, individuals will have an opportunity to respond to a set of questions that were supplied. Clearly, we have 1 hour and 15 minutes targeted for this piece of the hearing. I will certainly give you the latitude for whatever statement any of you would like to make in addition to the questions that were provided for you.

At this time, let me just introduce everybody en bloc and then we will work our way around the table, starting to my right. Michael Caldwell is Commissioner of Health, Dutchess County Health Department, Immediate Past President of the National Association of County and City Health Officials. Michael, welcome.

Peggy Honoré, Chief Science Officer, Senior Deputy Advisor, Mississippi State Department of Health. Welcome.

Nicole Lurie, Senior National Scientist and Paul O'Neil Alcoa Professor of Policy Analysis—that is a long one. Welcome and congratulations.

Elin Gursky—Elin is the Principal Deputy for Biodefense, National Strategies Support Director. Welcome.

Tara O'Toole, CEO and Director, Center for Biosecurity at the University of Pittsburgh Medical Center. Welcome again, Tara.

And Lisa Kaplowitz, Deputy Commissioner for Emergency Preparedness and Response, the Virginia Department of Health. Dr. Kaplowitz, welcome.

Dr. Caldwell, let us start with you.

STATEMENT OF MICHAEL C. CALDWELL, M.D., COMMISSIONER OF HEALTH, DUTCHESS COUNTY HEALTH DEPARTMENT, AND IMMEDIATE PAST PRESIDENT, NATIONAL ASSOCIATION OF COUNTY AND CITY HEALTH OFFICIALS (NACCHO)

Dr. CALDWELL. Good morning, Mr. Chairman, Senator Burr. It is a special distinct honor for me to be here with you today, especially knowing that my grandparents are in good hands in Pinehurst, North Carolina.

Senator BURR. We are delighted to have them there.

Dr. CALDWELL. I am here as a local public health official. I have been one for 12 years now in Dutchess County, New York. I am an internal medicine physician and I serve under our county executive, William Steinhouse. We are the home, as you probably know, of Franklin Delano Roosevelt, so we get a lot of inspiration in difficult times, right on the Hudson River.

We were greatly impacted by September 11, just north of New York City. Our mayor of the city of Poughkeepsie lost her husband that day. Right afterwards, an anthrax—when the NBC studios were hit, people came home to Dutchess County and went to their local hospitals and I got phone calls asking me, as the local health official, how could I help them? I distinctly remember a father of an Eagle Scout who called me saying he got a congratulatory letter from Senator Daschle. What should he do with the letter? It was dated the same day the anthrax came about.

So we deal on the local public health departments with unusual events, but we also, more importantly, deal with day-to-day events—outbreaks at schools, outbreaks in swimming pools, and also outbreaks that might just be of a major public health concern,

like meningitis that we just had in Marist College, where we lost a young freshman girl and we had to be there to respond.

The most important message that I would like to bring to you today is that we need to integrate all of our new surveillance systems into our daily activities. I thought you made an excellent point in the first panel where you said that there were two States that responded to Katrina, and you saw how one had a surge capacity plan and one had an integrated plan where they were constantly practicing their drills, and I think you really hit the nail on the head where you saw how you had a State that was integrative, practicing, and making sure that they were communicating.

After September 11, I became a card-carrying member of the Dutchess County Chiefs of Police Association. I don't think you would have seen that before September 11. The main point is that we are building relationships and we are working together and we are conducting exercises together in ways we have never done before. Thank you.

[The prepared statement of Mr. Caldwell follows:]

STATEMENT OF MICHAEL C. CALDWELL, M.D., M.P.H., COMMISSIONER OF HEALTH, DUTCHESS COUNTY DEPARTMENT OF HEALTH, NEW YORK

Chairman Burr, Senator Kennedy and other distinguished Senators, Good Morning. My name is Dr. Michael C. Caldwell, MD, MPH and I am the Commissioner of Health in Dutchess County, NY, home of Franklin & Eleanor Roosevelt, and I serve under County Executive William R. Steinhaus. I come before you today as an internal medicine physician and a public health officer with 12 years of experience in local public health practice. I also currently serve as the Immediate Past President of the National Association of County & City Health Officials (NACCHO) and so my views are informed from my contacts with my colleagues from across our country. I'm pleased to present you with some of my thoughts and insights today as you prepare to reauthorize the *Public Health Security and Bioterrorism Preparedness & Response Act of 2002*. Strengthening our public health infrastructure (local, State and Federal) is essential to our preparation for and response to health threats to our citizens. Expanding our public health capabilities will serve to protect the overall health of our Nation.

Paramount to this effort should be the investment in the expansion and continued training of our public health workforce. As this workforce is strengthened, it also needs to train and be further integrated with our traditional emergency response partners in police, fire, emergency medical services, as well as our colleagues in the broader health-care, educational, business, intelligence and criminal justice communities. Public health practitioners cannot and do not work alone. Public health departments are the community leaders in improving preparedness for public health emergencies but they are wholly dependent on the participation of a full range of community partners who will be engaged in the local response to such an emergency. This includes the partners noted above as well as local emergency managers, elected officials, hospitals, physicians and other health care providers. Overall, the functionality of a public health infrastructure in protecting communities is highly dependent on skilled, trained people from many disciplines who plan and exercise their plans together and engage in a process of continuous relationship building and improvement based on the outcomes of each exercise or each real event. I have responded to the three specific questions that the subcommittee has requested below.

Question 1. How do we best make progress towards a national public health infrastructure with real-time situational awareness?

Answer 1. No disease surveillance system can work without our workforce of clinicians as a core foundational component. The astute clinician is the source of most pertinent data on the occurrence of symptoms and the diagnosis of disease, regardless of how that data are subsequently reported and analyzed. Clinicians are often the first persons in a position to set off a public health alarm if they note an unusual finding. One of the best-known examples of the benefits of strong clinician/public health department relationships was the early identification of the first case of anthrax in Palm Beach County, Florida in October 2001. An alert physician who treated the first victim was immediately suspicious and alerted the director of the

county health department, who expedited a laboratory diagnosis and the initial response, which then led to prompt activation of the local emergency response system. This was a success resulting from conscious efforts to develop good working relationships between clinicians and public health. It did not happen by chance. More common is a call that my staff or I will receive from an infection control nurse or doctor at one of our local emergency rooms about suspected infectious diseases such as meningitis. This happened to us in Dutchess County two times since November. Our most notable case was when we lost a young 19-year-old student from Marist College. This resulted in a swift and comprehensive public health investigation and response, not only in our community, but in the student's hometown over 100 miles away. We reacted quickly with well-practiced communication and coordination. These skills will be put to use in any similar or more challenging incident that our County may face.

The elements of situational awareness, including lab and hospital reporting, interconnected surveillance systems, consistent epidemic monitoring and reporting, are all important tools and we fully support their further development. Local, State and Federal public health practitioners alike would benefit from improvement in the availability and analysis of real-time information on the occurrence of symptoms and diagnoses. However, we must be mindful not to rely on them exclusively. For instance, lab reporting is important to confirm clinical observations and track trends, but it usually comes too late to identify an outbreak early. Similarly, hospital reporting depends on personnel entering accurate clinical data on a timely basis. Some of the most effective local disease surveillance systems have made use of public health personnel who are out-stationed or in regular contract with hospital emergency rooms. They have the ability either to observe events or to discuss them directly with the ER staff. In some jurisdictions, they can then enter information into a system that aggregates the data and provides a real-time picture of the patterns of disease that are occurring in the community. Hospital-based surveillance also has its limitations, however, because it does not detect disease until it has grown serious enough to require a hospital visit.

Physicians and other health care providers are essential in reporting clinical suspicions early. Until we have a universal electronic medical record, interoperable health information systems and accessibility by public health officials to real-time data that provides protections for patient's personal information, the astute clinician who knows when and how to notify the health department is our best defense. As a local practitioner, I believe strongly that skilled people and the relationships among them are the backbone of any disease surveillance system. Electronic systems are the tools that help them but cannot replace them. It is critical that we recognize that our human public health professionals and affiliated colleagues are the linchpin to make our growing dependence on sophisticated technology for biosurveillance both reliable and functional.

The health department itself must have sufficient trained personnel to receive and respond to disease reports 24/7. This represents a fundamental change for public health practice, which traditionally has been able to perform its duties during the work week. Unlike police and fire departments, which have always worked in shifts to enable 24-hour protection, public health has transformed dramatically over the past 5 years. We have changed the expectations of our workforce and we have found ways to stretch and augment existing personnel to provide 24-hour coverage. Federal funding has provided some assistance but not enough to get where we need to be.

As a local public health practitioner, I know that real-time situational awareness will always be dependent on trained people, effective relationships and easy, prompt communication among them. I urge the subcommittee to give equal weight to this essential dimension of local situational awareness, as well as to the continued development of technologies that will facilitate the rapid acquisition and management of knowledge about disease in a community.

Question 2. How do we recruit, train, and retain a prepared public health workforce with the ability to respond to national threats—whether acts of terrorism or by Mother Nature?

Answer 2. Expanding and improving the public health workforce has two dimensions. The first is the "pipeline"—the motivation and number of individuals wanting to enter a public health profession and the availability of mentors and an education to do so. The second, and often over-looked, is the training of persons who are already employed in health departments or in other sectors of the community.

In a public health emergency, the entire workforce of a public health department and many other public sector employees will engage in a response, aided by volunteers and other community partners in the private sector. Locally, we need the flexi-

bility to relieve all such potential responders of their normal duties long enough to train and exercise for emergencies. Police, fire and military personnel systems routinely plan for ongoing training and expansion of skills to prepare for the worst. Public health departments have traditionally been chronically understaffed and have not been able to do this. When personnel spend time preparing for their emergency roles, the work they would ordinarily do does not get done in a timely fashion, if at all.

Establishing a scholarship and loan forgiveness program for public health professionals who complete academic programs in shortage areas and enter public service is one approach to expanding the pipeline. The Public Health Preparedness Workforce Development Act proposed by Senators Hagel and Durbin is a good model. However, we cannot expect it to solve all shortages. Indeed, most local health department personnel have come to public service through routes other than professional training in public health. Therefore, we must in tandem rely on retraining and cross-training our current workforce. This will require extra funds for this purpose and some greater flexibility in the uses of our personnel.

The key to a prepared workforce is to define systematically the roles and responsibilities of each person in an emergency and the skills or competencies that they need to fill those roles. We must then set standards for achievement of those skills, train them in those skills and then test the training through exercises. We must recognize that gaining the competencies necessary for an emergency role should be an element of each health department employee's primary job, whether that job is restaurant inspector or clinic nurse.

Question 3. How do we develop public health systems research, paramount for developing evidence-based best practices and benchmarks, for an all-hazards public health response?

Answer 3. There can be no substitute for public health system research based on real experience in real communities. Moreover, developing an evidence base for public health response requires examining not how the public health system operates in isolation but how it operates in the context of the entire community response.

The best way we know to develop evidence of what is needed for a successful public health response is an iterative process of planning and exercising. Such a process entails making a community-wide plan that involves all the relevant responders, training all responders for their role in executing the plan, exercising the plan on a large scale, doing an after-action report to identify where and why the plan didn't work, changing the plan accordingly and exercising it again to determine whether the changes made a difference. It will then be possible to identify the inputs into the response that generated the outcome.

It is essential to recognize that the public health response never involves just public health and medical personnel. Our partners in police, fire, emergency management, schools, and businesses, as well as our community's health care providers, will have important roles in a large-scale event, such as widespread influenza. Best practices and benchmarks for public health performance will not be meaningful unless that performance is evaluated in the context where it will really happen—in an exercise that involves a community's entire emergency management system that is operating as required under the National Response Plan and is compliant with the National Incident Management System.

Public health systems research would benefit from involving other disciplines not commonly associated with public health. For instance, the health department in Montgomery County, Maryland engaged systems engineers from the University of Maryland in applying queuing theory to the problem of how to organize a mass vaccination clinic most efficiently. The result of their collaborative research and development was software that they and others are using to streamline their systems for mass dispensing of pharmaceuticals and mass vaccination.

Overall, our public health infrastructure has improved since 2001 but it still requires further investment, development and evaluation. I appreciate the thorough and serious effort that you are making to understand and strengthen our country's public health capacity and capability. Protecting and defending our citizens health is of paramount importance for our society to function in a time of crisis. The time to prepare and strengthen our public health infrastructure is now at hand.

I wish you all the very best as you work to improve the *Public Health Security and Bioterrorism Preparedness & Response Act of 2002*. Thank you for the opportunity to present my thoughts to you this morning.

Senator BURR. Peggy.

STATEMENT OF PEGGY A. HONORÉ, CHIEF SCIENCE OFFICER, MISSISSIPPI DEPARTMENT OF HEALTH

Ms. HONORÉ. Thank you, Mr. Chairman and other distinguished committee members. Thank you for this opportunity to present to you today. I am Peggy Honoré, Chief Science Officer of the Mississippi Department of Health. I currently also lead a national Robert Wood Johnson-funded initiative to advance fields of study in public health systems research and public health finance.

The challenges facing the public health system today are daunting, particularly since the system was characterized nearly 20 years ago as being in disarray by the Institute of Medicine. Even since then, preparedness has emerged as an additional critical function. Numerous reports over the past decade have warned of an imminent workforce crisis. Very little is known about the finances that fund the system. And reports have consistently said that public health has struggled to clearly and concisely articulate its role to the public.

The Mississippi Department of Health has taken a leadership role to implement technology statewide for real-time diagnosis of disease and other threats, to increase biosurveillance activity. This was probably most evident during the recent Katrina events. However, we also feel that a national real-time situational analysis system is contingent upon the confluence of a number of factors. These include establishment of national evidence-based guidelines for implementation, sufficient levels of funding, clear government roles, and appropriate workforce competencies, all of which I will address at the appropriate time.

Senator BURR. Great.

[The prepared statement of Ms. Honoré follows:]

PREPARED STATEMENT OF PEGGY A. HONORÉ, DHA, MHA, CHIEF SCIENCE OFFICER, MISSISSIPPI DEPARTMENT OF HEALTH

EXECUTIVE SUMMARY

Public Health Preparedness in the 21st Century

- Daunting challenges facing the public health system
- Institute of Medicine characterization as in disarray
- Challenges and unanswered questions are growing exponentially

1. How do we best make progress towards a national public health infrastructure with real-time situational awareness?

- Voluntary jurisdiction disease reporting is not adequate to protect all Americans
- Biosurveillance must be the standard public health practice
- Automated electronic disease surveillance systems for near real-time disease detection adopted throughout the United States and particularly the State of Mississippi Department of Health (MDH)
- Situational-awareness systems implemented in MS for timely notification and investigation, increased diagnostic capabilities for common and exotic conditions utilizing high quality photographic imagery, exposure identification and reporting system in 400 ambulances and 75 hospital ERs, electronic surveillance technology in all hospitals
- Assurance of a national system contingent on confluence of interrelated factors that include evidence-based guidelines, adequate funding, clearly defined governmental roles at all levels, sufficient workforce competencies
- Evidence through research needed to assess organizational structure compatibility with desired systems, identification of performance metrics, establishment of workforce competencies

2. How can we recruit, train and retain a prepared public health workforce with the ability to respond to threats?

• 64 percent of MDH employees deployed in aftermath of Katrina
• Comprehensive training in disasters nursing and special needs sheltering for MDH staff and 2,000 First Responders
• Dire assessments of workforce such as lack of education, non-competitive salaries, and high turnover rates threatens stability
• Assessment of workforce capacity to support vision for complex situation-awareness systems
• Educational level for 60 percent of MDH workforce less than bachelors degree
• Void in career track below MPH level
• MPH curriculum insufficiency to address needs in public health finance
• No datasets on jurisdiction funding levels similar to what is available for school districts in America
• IOM unable to provide guidance on workforce and funding due to scarcity of research and evidence
• Borrow models from other disciplines such as psychology, pharmacy, and engineering
• Partner with nation's Community College Systems
• Shift from training to educating the workforce—MDH Collaboration for Workforce Education with the MS Community College System
• Support for Public Health Preparedness Workforce Development Act

3. How do we develop public health systems research, paramount for developing evidence-based best practices and benchmarks for an all-hazards public health response?

• Research documented as one of the 10 Essential Public Health Services
• National research provided valuable insights into variability of preparedness spending and impacts
• Lack of standardized performance metrics
• Examinations needed for funding prioritization and guidelines, public health system impact to 75 percent not receiving antivirals, system capacity to implement all-hazards plans, assessment of public health funding sources, uses, and effectiveness
• Modeling needed to assist mass evacuation, staff deployment, special needs sheltering
• Public health system lacks evidence for best practices and datasets for benchmarking
• Research as a QI fabric issue woven through all aspects of the system including and particularly practice
• Lack of attention 10 years after observation of little research and measures to examine performance
• National initiative to strengthen public health systems research is fundamental, urgent, and essential

Mr. Chairman, other distinguished subcommittee members and meeting participants, thank you for the opportunity to present at the March 28, 2006 roundtable titled Public Health Preparedness in the 21st Century. I am Peggy A. Honoré, Chief Science Officer for the Mississippi Department of Health. In this role, I currently lead a national Robert Wood Johnson Foundation funded initiative to advance fields of study in public health systems research and public health finance as a means of bridging knowledge gaps between science and the practice of public health. Support for this work is viewed as critical to ensuring a robust public health infrastructure grounded in sound evidence-based practices to ensure the safety and well-being of all Americans.

The practice of public health in America is delivered through a complex system of organizations and industries working to ensure conditions in which all citizens can be safe and healthy. This enormous operational structure makes understanding the connected dynamic relationships in the system a complex challenge. My observations on this challenge and the three questions that we are to address today come from the unique perspective of having served in the three diverse areas of private industry, government (State and Federal) and academia, primarily as a practitioner and transitioning into practice-based research.

The challenges facing the contemporary public health system are daunting particularly since the system was characterized nearly 20 years ago by the Institute of Medicine (IOM) as being in disarray. Since then, preparedness has emerged as an additional critical function. Numerous reports for over a decade have warned of an imminent workforce crisis. Very little is known about the finances that fund the system and the profession has struggled to clearly and concisely articulate its role to the public. Open dialogue on these issues that put all Americans at risk are fun-

damentally essential and my remarks are offered with the highest degree of appreciation for being included in the discussion.

(1) How do we best make progress towards a national public health infrastructure with real-time situational awareness?

In the post 9-11 era, it has become apparent to the public health community that voluntary disease reporting by jurisdictions is simply not adequate to protect Americans from the current threat of intentional and naturally-occurring disease outbreaks. The recent anthrax attacks via the postal system and global concerns about an influenza pandemic are good examples of this ever-changing threat. In response, a much more proactive approach to disease detection has been adopted throughout the United States and specifically in the State of Mississippi. Now, automated, electronic syndromic disease surveillance systems are beginning to be used to supplement the historically proven and still critical reporting by physicians, hospitals, and clinical laboratories.

As a direct benefit of Bioterrorism Preparedness and Response Act funding, the Mississippi Department of Health (MDH) has taken a leadership role to implement technologies throughout the system for near real-time diagnosis of disease and other threats. Most important, the only practice and academic partnership in the Nation for syndromic surveillance that I am aware of is with the MDH and University of Mississippi Medical Center. The MDH working with vendors have implemented several systems in Mississippi as listed below.

- TheraDoc—technology that integrates individual electronic patient records with clinical data, global medical knowledge and institutional protocols. The system has been implemented at the University of Mississippi Medical Center in Jackson and will facilitate timely notification and investigation of reportable diseases and suspect conditions directly to authorized MDH staff.
- Visual Dx—diagnostic reference software that includes continuously updated high quality photographed images of diagnostic possibilities. This system was developed for military and first responder field use. It will assist front-line clinicians to correctly identify and differentiate clinical syndromes resulting from the intentional use of biological agents. For example, few physicians currently practicing in the United States have ever seen an actual case of smallpox or anthrax, and this system is being deployed to the local hospitals that will likely serve as the entry point into the healthcare system of the first case of an illness that might result from a terrorism attack. The training value of this system to clinicians will be immeasurable if we ever have a biological event in our State.
- ThreatScreen—an exposure/identification, data collection, and reporting tool used to quickly access victims to determine chemical, biological, or nuclear agent exposure and where data is shared in real-time through a wired or wireless connection. The system is being installed throughout the entire Mississippi Emergency Medical Services Trauma Care System. The application will be available in all 480 licensed ambulances and 75 hospital emergency rooms.
- Early Aberration Reporting System (EARS)—an electronic syndromic surveillance system that is being installed in hospitals throughout the State. This system will provide sensitive and timely notification of both intentional and naturally-occurring disease outbreaks anywhere in the State that will permit a more timely, lifesaving response.

These information technologies have greatly enhanced the department's capacity for Biosurveillance. However, ensuring a national real-time situational awareness system is contingent upon the confluence of a number of interrelated factors. These include establishment of national evidence-based guidelines for the implementation of such systems, sufficient levels of funding for implementation, clear roles and responsibilities for Federal, State, and local agencies, and appropriate competencies at all levels in the public health workforce to operationalize and maintain the systems.

While much has been accomplished at the Federal level to develop IT situational-awareness systems, it is unclear if examinations, through research or evaluations, have been conducted to document best practices or to facilitate course corrections. Examinations are warranted to address questions such as: what is the impact of organizational structure (e.g. centralized, decentralized, or regionalized) at the State and local levels to effective implementation of situational-awareness systems; what metrics determine organizational capacity to implement such systems; and what are the workforce competencies and skills needed prior to implementation to operationalize an effective system?

Biosurveillance must be a standard practice in public health and the knowledge acquired through research and evaluation would provide some degree of assurance that the system is truly evidence-based and capable of protecting us all.

(2) How do we recruit, train, and retain a prepared public health workforce with the ability to respond to national threats—whether acts of terrorism or by Mother Nature?

Over 64 percent (1,400 employees) of the MDH workforce was deployed to respond in the aftermath of hurricane Katrina. A comprehensive workforce-training program was established over the past 3 years using Bioterrorism Preparedness funding. Statewide disaster nursing and preparedness training was provided to all nurses and environmental health specialist through the University of Mississippi Medical Center and State community college system. Training was focused on building competencies for disaster nursing and management of special need shelters during disasters. Besides the MDH employees trained, we also provided training to over 2,000 first responders across the State.

From a system-wide perspective, a reality that threatens the stability of the public health system is the dire assessments of its workforce. Key findings documented through various research efforts include lack of formal education and training in core public health education, recruiting difficulties, non-competitive salaries and high turnover rates. Unlike other professions, there is no common skill set established for entrants into the profession of public health. And the lack of professional licensure and credentialing in key functions serves to weaken the system. Without attention to this problem, do we know if the workforce is capable of supporting the vision for all-hazards preparedness utilizing complex situational awareness systems?

The Master of Public Health (MPH) is touted as the entry into the field. Ironically, in the MDH over 60 percent of employees have educational levels less than a bachelor's degree. These workers have already entered the profession but lack opportunities for public health education at the undergraduate level because the entry degree is the MPH. Also, recent research into finance courses of MPH curriculums found that the content is directed more to the medical care delivery system than to providing finance skills needed in public health settings. Because attention in academia has been focused on the financial components of the medical care delivery system, is this a contributing factor to why we know so little about the sources, uses, and effectiveness of funding for public health? Unlike data for every school district in America, data are not readily available to determine county level funding allocations to public health services in each jurisdiction. In 2003 the IOM even reported that attempts to provide guidance on workforce and funding for the public health infrastructure was not possible due to a scarcity of research and evidence to support such recommendations.

A significant research finding by the IOM and others is the lack of collaboration between schools of public health and health departments. This gap between practice and education serves as a chasm that further divides science from practice. Strategies should be formulated, funded and implemented that provide opportunities for more structured collaborations between health departments and schools of public health based on models from academic medical centers.

Public health should also research workforce models implemented in other professions to bridge gaps between practice and science. The community psychology doctorate degree, focused on population and organizational level interventions, emerged in the 1960s. Leaders in that profession recognized the need for professionals to be trained in population level evaluation and analysis compared to the more traditional clinical or individual level.

An additional strategy that can be borrowed from other professions such as pharmacy and engineering is to reach out to the Nation's system of community colleges. Over 65 percent of all healthcare workers have some level of training at community colleges. Both professions have collaborated with community colleges and universities for joint programs leading to doctorate degrees. This could serve as an ideal mechanism to expand diversity in the public health workforce since 40 percent of community college students are from underrepresented populations. The MDH is currently developing a model to educate the existing and future public health workforce through the State's community college system. The program will provide opportunities for public health tracked associate degrees that articulate to 4-year institutions. This movement from training to educating the workforce creates a paradigm shift that serves to the benefit of public health, the individual, and society.

The Nation should also invest in the current and future public health workforce by enacting the Public Health Preparedness Workforce Development Act (S. 506). Public Health simply cannot attract the talent needed for a sustainable public health system without this level of Federal commitment. The best and brightest of physicians, epidemiologist, laboratory technologist, information specialist, researchers and others critical to a robust system will simply go elsewhere.

(3) How do we develop public health systems research, paramount for developing evidence-based best practices and benchmarks, for an all-hazards public health re-

sponse? Do issues ranging from disease forecasting to financial modeling of Federal and State public health investments need further study? How is "public health preparedness" best defined and what are the metrics for measuring success?

The function of research was identified as one of the 10 Essential Services of public health agencies in the early 1990s. The role of research and its relevance to effective preparedness is valued by the MDH. The MDH is one of only a few health departments in the Nation with an Office of Science dedicated to ensuring that evidence-based practices are embedded throughout the agency. The function is practice-based and aligned with goals of using research combined with a development function to implement effective practices and services.

After many decades of inadequate funding, the Public Health Security and Bioterrorism Preparedness Act of 2002 provided valuable funding to build disaster preparedness and response capacity at the State and local level. A few national research projects have provided valuable insights on the wide variability of how the funding has been utilized while also trying to assess the impact on system preparedness. Lack of available data has made some examinations particularly challenging. And it has not been abundantly clear how preparedness performance could be systematically measured given the lack of widely accepted standardized performance metrics. There are many other critical areas of research that warrant attention as well. In addition to some research topics laced throughout this document, others include:

(a) modeling to assist with prioritizing State and local level funding decisions
(b) examinations of lessons learned from Katrina and other disasters to determine the impact of funding decisions to effective preparedness
(c) determination of system impact on 75 percent of the population that will not receive antivirals
(d) comprehensive examinations of national, State and local spending on preparedness
(e) examinations to identify system preparedness as well as programmatic performance metrics
(f) comprehensive datasets to facilitate benchmarking
(g) comprehensive examinations at the Federal, State, and local level of the composition, utilization, and sources of funding for the public health system
(h) modeling to assist with mass evacuation planning, staff deployment, and special sheltering needs
(i) impact to the public health system of staff redirected to acute care during disasters
(j) impact to traditional public health functions during disasters
(k) examinations to determine system capacity to implement Federal all-hazards disaster plans

We cannot build, let alone sustain, a public health system lacking the evidence for best practices for traditional functions as well as an all-hazards public health response. Research is the instrument for examinations to understand the complex system dynamics of public health practice. It is a quality improvement fabric issue that should be woven throughout all components of the system. However, it seems somewhat ironic that Federal preparedness grant guidelines prohibit utilization of any funding for research. The Center for Studying Health Systems Change noted in 1996 that the public health sector, unlike the medical care system, had very little research and measures that could be used to examine the performance of the system. A decade later, very little progress has been made to address the problem.

A powerful method to defining, measuring, and sustaining capacity for public health system preparedness would be to establish a national initiative dedicated to strengthening research efforts. The primary purpose should be to coordinate national preparedness research efforts and to ensure that the public health infrastructure is intact to protect the safety and health of all Americans. The program should be structured to primarily fund collaborations between academia and practice agencies (to ensure practicality, relevance, and translation) with the intent of establishing demonstration projects for replication nationwide. Insuring preparedness through science is fundamental, urgently needed and essential. Research has been noted as a fundamental service of public health practice. Every disaster creates an elevated sense of urgency. And shared interests for a safe and secure America make it essential.

Senator BURR. Dr. Lurie.

STATEMENT OF NICOLE LURIE, M.D., SENIOR NATIONAL SCIENTIST AND PAUL O'NEIL ALCOA PROFESSOR OF POLICY ANALYSIS, THE RAND CORPORATION

Dr. LURIE. Thank you, Senator Burr, for the opportunity to be here today. I won't reiterate what my colleagues here have said, and many of my comments obviously are in the written testimony. I do want to point out that my comments today and my testimony are based largely on research that my colleagues and I at RAND have done over the past 3 years. This has included evaluations of public health preparedness in two States, California and Georgia, as well as a series of projects we have done for the Office of the Assistant Secretary for Public Health Preparedness at HHS.

In the course of this work, we have conducted 32 tabletop exercises around the country in different local health departments on topics ranging from smallpox and anthrax to pandemic flu. We have also site visited and done key informant interviews with people in 44 different communities and 17 States. So I think we are getting a pretty good sense of what the lay of the land is with regard to public health preparedness.

First, I want to say that over the time that we have been doing this, we have seen evidence of substantial improvement and we are very encouraged by the fact that, by and large, this investment appears to be paying off. What I want to focus my remarks on this morning are on the sort of commonly seen gaps that we see across the country, because I think it is fair to say that we see them over and over and over again. Some of them are things we have discussed this morning and some of them aren't.

The first is the continued set of gaps in public health epidemiology and investigational capacity, the issues related to shared situational awareness and workforce competency to be able to evaluate EPI information and to go ahead and investigate and outbreak.

The second relates to persistent confusion at all levels about who does what, when in an emergency, and we see this in almost every exercise we have done. There is a lot of confusion about when you stand up an incident command structure, open an Emergency Operations Center, when it is a local, State, or Federal responsibility to handle the issue at hand.

And along with that, there is persistent confusion about what the role of public health is in responding to some of these public health events. I think we have done much better in the relationships, looking at the relationships between public health, fire, police, and other emergency responders, but I think there is still an awful lot of gray area and fuzziness about what to do there.

The next area that I want to highlight is the one of vulnerable populations, and I will use the term vulnerable fairly loosely. But by and large around the country, special needs populations, vulnerable populations, ethnic and minority groups have been, by and large, left out of the public health preparedness discussion. In an emergency, it is going to be critical that everybody is able to be reached, that everybody trust their government to the extent possible to do what needs to be done. We know there are large groups of people that can't be reached, largely because of language issues or sometimes because they are remote or because they don't necessarily trust government, and so special efforts need to be made

in the planning phase to be able to work on the response phase that we need to work on.

The next area I would like to highlight is obviously one in the area of questions and that is workforce development, and to highlight two things. First is to say, we are only going to get good people to join the public health workforce if they see a career path ahead of them, and if the funding for this isn't stable, people aren't going to see a career path ahead of them and are going to choose to do other things.

The second, which I highlighted in my written testimony, are two big gaps, one in leadership development, and I am delighted to hear that the CDC is starting to address this, and the other is quality improvement. Time and time again, we do exercises with people who discover the same gaps that they discovered in the last exercise, or the exercise before. And by and large, there hasn't been an institutional culture or potentially the know-how about how to fix those gaps.

And finally, the other issue that we can talk about later is the criticality of defining preparedness and being able to measure it. We are now 3 or 4 years into this effort. We still don't have a set of performance measures that we are really happy with and a set that can be objectively tested, so there is work to do there both on the research side and the implementation side. Thank you.

Senator BURR. Thank you.

[The prepared statement of Dr. Lurie follows:]

PREPARED STATEMENT OF NICOLE LURIE,[1] M.D., M.S.P.H., PHYSICIAN AND PUBLIC HEALTH RESEARCHER, THE RAND CORPORATION

My name is Nicole Lurie, M.D., M.S.P.H. I am a physician and public health researcher at RAND. As you know RAND is a non-profit, non-partisan think tank whose mission is to improve public policy. Health is our fastest growing and largest unit and many of us are passionate about making a difference in public policy. I am happy to have the opportunity to share my thoughts on public health preparedness in the 21st century. My comments will be based largely on the research that my colleagues and I have done at RAND in the past 3 years. This includes evaluations of public health preparedness in two States—California and Georgia, as well as a series of projects we have done for the Office of the Assistant Secretary for Public Health Preparedness at HHS. In the course of this work we have conducted 32 tabletop exercises on a range of issues, including smallpox, anthrax, botulism, plague and pandemic influenza. In addition, our team has visited and interviewed key officials from 44 communities in 17 States. Over the 3 years we have been doing this work, we have seen clear evidence of progress in preparedness across a range of dimensions, although I'll also be the first to tell you that we have miles to go before we sleep, especially as we face the threat of pandemic influenza. It is from this perspective that I address your specific questions.

Question 1. Situational awareness is based on timely lab and hospital reporting, interconnected surveillance systems, consistent epidemic monitoring and reporting, and appropriate risk communication. Currently, there is wide variability across the country in these capabilities. How do we best make progress towards a national public health infrastructure with real-time situational awareness?

Answer 1. Our findings corroborate your assessment that the capabilities to promote situational awareness vary widely across the country. While we have seen

[1] The opinions and conclusions expressed in this testimony are the author's alone and should not be interpreted as representing those of RAND or any of the sponsors of its research. This product is part of the RAND Corporation testimony series. RAND testimonies record testimony presented by RAND associates to Federal, State, or local legislative committees; government-appointed commissions and panels; and private review and oversight bodies. The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

clear evidence of strengthened syndromic surveillance systems and a much more robust Laboratory Response Network (LRN), the level of sophistication of information technology, as well as the ability to analyze and use it, varies widely.

Our research points to two areas of particular need: ongoing investment in technologies to make possible shared situational awareness, as well as support for building the human and organizational relationships needed to get the most out of these technologies.

A key priority is the need for continued investment in interoperable information technology for routine and enhanced surveillance, provider notification, outbreak investigation and event management. The current proliferation of new, siloed systems is unlikely to accomplish the goal of improving shared situational awareness. Many are not linked, either within or across States, and some bypass State and local health departments in the early phases of data capture and transmittal. Some health departments report challenges in monitoring multiple systems, particularly those with frequent "false positives", while others do not yet have even basic technologic capabilities in place. Ultimately, these information systems need to link not only our health departments and laboratories, but also our hospital emergency and inpatient departments and our outpatient practices and community clinics. Key to improved situational awareness continues to be the astute clinician, who in almost every important outbreak or public health emergency has been the first reporter. Hence, continuing to strengthen relationships between public health and the clinician community—linking public health and clinical practice through robust information systems and communication networks—remains of paramount importance. I anticipate that continued building in this area will be needed for at least several years, followed by support that maintains the gains we make, rather than falling back into a cycle of disinvestment that will force public health to backslide once again.

But these investments will be effective only if there is greater consistency in technological capabilities across public health and improved linkages among public health departments and between public health and other organizations with responsibilities for shared situational awareness and emergency response. While technological solutions are part of the answer, we also need to recognize the limits of what technology can do. For example, we need to maintain the ability to function in a Katrina-like situation, in which Mother Nature disabled electronic and cellular communication for a prolonged period of time. We also need to continue to look for solutions to problems that are unlikely to be touched by improved technology. For example, we should remember that the Nation's 45 million uninsured may be more likely to delay seeking care, even in a public health emergency, and that signals from some populations may be completely missed no matter what systems are in place for monitoring and reporting. And finally, the astute clinician is still more likely to pick up the phone and call the State or local health department than to rely on electronic reporting.

Priority also needs to be given to strengthening relationships and improving lines of communication within public health and between public health and other entities involved in emergency response. Our research has consistently found confusion about who is supposed to do what in a public health emergency, and when responsibility shifts from local to State or Federal entities. And there are still communities in which public health and other first responders lack equipment to communicate with one another in an emergency. Strengthened relationships and improved communication will help mitigate these problems, but technology alone will not make them go away.

Continued support for relationship building across entities—including health and public health, emergency response, etc.—to develop and enhance shared situational awareness—is needed. The transformation of public health is bringing together people from very different cultures, including military and first responder communities and public health. Technology puts people in touch with each other, but relationships, shared mental models and shared language and vocabulary is what allows them to "communicate." Fortunately, relationship building can be facilitated through continuing support for the process of planning and continued exercising. Moreover, one clear area in which Congress can help is to insist on greater congruence and consistency among program guidance from different agencies, including DHS, CDC and HRSA and others. Currently, the guidance provided by these organizations is often confusing, inconsistent, and at times contradictory. These organizations should be strongly encouraged to focus guidance on shared, crosscutting capabilities. Future funding should be structured in ways that forces these agencies and their many stove-piped programs to work more closely together.

Question 2. How do we recruit, train, and retain a prepared public health workforce with the ability to respond to national threats—whether acts of terrorism or by Mother Nature?

Answer 2. A well-trained, prepared public health workforce is paramount to our Nation's ability to deal with the wide array of threats to the public health. While, in the course of our work, we found some fabulous public health professionals, we also found problems across the areas of recruitment, training, and retention. In our research we found that numerous health departments had people in critical functions about to retire with no ability to replace them. In other departments, we found people in critical positions who had absolutely no training to do the jobs they were expected to do. In almost every community we heard that salaries for public health professionals, especially laboratorians and epidemiologists are not competitive enough to recruit and retain high-quality staff. Many lose their best staff to the private sector over these issues.

Stability in funding is needed to support recruiting and retention efforts. The pipeline for those wanting to enter public health practice is quite small. While the prestige and salary of such positions is clearly an issue, so too, is the uncertainty about whether there is long-term support for public health preparedness. The initial enthusiasm spurred on by early investment has clearly been dampened by continued cuts to the program. Without stability in funding, market forces will give incentives to the best and brightest—and even those who are simply "good enough"—to go elsewhere, rather than to our Nation's public health agencies.

More attention should be given to defining public health responsibilities. You will doubtless hear from other panelists about the need to define develop and maintain a database with which to monitor the status of the public health workforce, as well as the need to define workforce competencies for public health. In addition, there needs to be more frank discussion of what are proper public health responsibilities and what should be done by other disciplines in collaboration.

Just because an event concerns a health threat or requires some sort of medical countermeasure doesn't necessarily mean that a public health professional should sit in the incident command chair, although it will be critical to have public health personnel working closely with others in a unified command structure. Indeed, once the existence of an emergency is clear, the early stages of many responses focus on logistics issues that require expertise other than that possessed by most public health professionals. For example, my colleagues have most recently shared with me their frustration at watching highly educated health scientists struggle to learn how to use pallet jacks in medical warehouses to deliver components of the SNS. Clearer thinking about what functions public health professionals do and don't need to do, as well as a set of financial ground rules about how they tap into components of the workforce funded by other non-preparedness sources to address day-to-day work, needs to be reflected in program guidance, provisions concerning funding fungibility, maintenance of effort, etc.

More attention is also needed to two areas of workforce development that our team has consistently noted as major gaps. The first is leadership development. Our research found that, more than any single thing, strong leadership distinguished those organizations that performed well on exercises from those that did not, and the better prepared, integrated public health agencies from those that were less prepared. While the willingness to take charge—command and control—is one aspect of leadership, strong leadership requires many other capabilities, including a clear vision, willingness to make decisions and assume responsibility, development of staff that can function independently, ability to collaborate across disciplines, ability to function in an inherently political environment, and superb communication skills. I believe that a significant investment in leadership development is essential, and that leadership development and training must become an essential element of public health training. Some health departments have understood the importance of this, and have even used preparedness monies for leadership development in their health departments. Let me also point out that such development also helps train the workforce of tomorrow, and is essential to succession planning.

The second area of substantial need is the development of quality improvement skills. Time and time again in our site visits and exercises, we found that health departments rediscovered problems that they had encountered in prior exercises, but that nothing had happened, often because staff lacked the time, knowledge and skills to act on them. Implementing quality improvement (QI) requires that staff at all levels of the organization have both theoretical knowledge and practical skills in quality improvement. While the need to improve public health emergency preparedness is widely recognized, less investment has been made in *creating the organizational capacity* needed to support that improvement. Leaders and

managers must have an understanding of QI in order to be able to formulate and communicate a vision for improvement. They, as well as program directors and staff, must have fundamental QI skills to translate this vision into practice.

Vehicles for increasing QI capacity could include development grants, education and training, technical assistance, tool development (including information technology), leadership and management training, and grants that incentivize and reward QI practices and continuous improvement in performance. While I am encouraged that the CDC preparedness goals now include "improvement," there is no explicit funding tied to developing the skills or programs to achieve this. To the extent that funding is seen as a "zero sum game," an emphasis on "improvement" without specific funding attached suggests that other things will need to be put aside to support this goal.

Question 3. How do we develop public health systems research, paramount for developing evidence-based best practices and benchmarks, for an all-hazards public health response?

• For example, do issues ranging from disease forecasting to financial modeling of Federal and State public health investments need further study?
• How is "public health preparedness" best defined and what are the metrics for measuring success?

Answer 3. We are facing a serious knowledge gap in relation to public health systems research, and especially the components that have to do with emergency response and situational awareness. One problem is that those who typically fund science research do not consider public health systems research to be either "science" or "health services research," and much of the public health community does not yet accept systems research as part of public health research. Furthermore, public health systems research is a very new field with almost no funding.

One area that should be given priority for funding is research to identify evidence-based best practices in emergency preparedness. Our work has identified a near total void in this area. Indeed, such research is necessary to provide the evidence base to support the development of guidelines, or performance measures and metrics. We have been fortunate to be able to use our work with HHS to break new ground in this important area. And our research has produced important findings that have helped advance the field. Let me give you just a few examples. Our work in California highlighted the fact that not all Americans are afforded the same level of public health protection. Our work on the ability of public health departments to receive and respond to emergency case reports highlighted serious system deficiencies in health departments, as well as the fact that perfect performance is achievable. And, our case studies have identified repeated "systems failures" in non-bioterrorism outbreak investigation and response.

This research gap can be addressed. Let me remind the committee that a similar gap once existed in the areas of quality of care and patient safety. It took significant investment in research to get the job done. A similar effort needs to be mounted here. Both AHRQ and CDC would be appropriate agencies to entrust with funding such research.

Research on evidence-based practices can help in the development of truly objective measurable performance measures. These are critical for assessing progress, generating improvement, and accountability. Evidence-based research can help to decompose the issues into identifiable components so that we can develop performance measures based on structure, process, and outcome. We would maintain that a smaller number of strong measures are probably more usable in the long run than hundreds of more difficult-to-measure items. Our work has made abundantly clear the need for greater alignment across guidance areas and the importance of focusing scarce measurement resources on these areas. Indeed, there is already quite a bit of overlap across guidance documents, but turf battles and measurement philosophies get in the way of progress. Even better would be more attention to examining response processes and pulling out crosscutting capabilities right from the beginning. We have been doing such work with the SNS and other areas of the Cooperative Agreement guidance, and are encouraged by the emphasis on capabilities-based and all-hazards planning is great (HSPD-8, NPG, etc).

It is important to recognize that the development of appropriate and effective metrics will require time—as well as trial and error—and research. In this area, we cannot let the perfect be the enemy of the good. For example, early measures in the area of quality measurement in the health care system—outcome reporting of cardiac surgery, and early HEDIS measures—were, by today's standards, fairly crude. However, the use of these measures over time, as well as a commitment to taking these measures seriously, made them get better. We can and should use a similar approach here.

Finally, let's not forget that assessments and standards just tell us where we need to be, but that we probably also need some real mechanisms to assure accountability to ensure that these things remain at the top of people's agendas. In closing, from our vantage point at RAND, the recent Federal investment in public health preparedness is paying off. This investment has injected new life into what was widely considered to be a moribund public health system. Our research, for example, indicates that State and local public health departments have made significant progress in their efforts to improve disease surveillance systems; to enhance laboratory capacity; and to communicate more effectively with hospitals, physicians and other community partners, the media, and the public. But as I have indicated above, many important gaps remain, and I am happy to discuss those that go beyond the questions that are the focus of this particular discussion. Investments in the areas of information technology, workforce development and public health systems research continue to be needed to sustain and build upon these gains and to create a public health system capable of minimizing morbidity and mortality associated with a wide range of public health threats.

SUMMARY

Question 1. Situational awareness is based on timely lab and hospital reporting, interconnected surveillance systems, consistent epidemic monitoring and reporting, and appropriate risk communication. Currently, there is wide variability across the country in these capabilities. How do we best make progress towards a national public health infrastructure with real-time situational awareness?

Answer 1.

- Continued investment in interoperable information technology for routine and enhanced surveillance, provider notification, outbreak investigation and event management.
- These investments will be effective only if there is greater consistency in technological capabilities across public health and improved linkages among public health departments and between public health and other organizations with responsibilities for shared situational awareness and emergency response.
- Technology alone will be insufficient. Continued support is needed to strengthen relationships and improve lines of communication within public health and between public health and other entities involved in emergency response.

Question 2. How do we recruit, train, and retain a prepared public health workforce with the ability to respond to national threats—whether acts of terrorism or by Mother Nature?

Answer 2.

- Stability in funding to public health preparedness is essential for students to see a clear career path in public health preparedness.
- Defining public health responsibilities more clearly.
- Emphasize workforce development, including leadership development and quality improvement skills.

Question 3. How do we develop public health systems research, paramount for developing evidence-based best practices and benchmarks, for an all-hazards public health response?

Answer 3.

- For example, do issues ranging from disease forecasting to financial modeling of Federal and State public health investments need further study?
- How is "public health preparedness" best defined and what are the metrics for measuring success?
- Funding for research to identify evidence-based best practices in emergency preparedness is critical, and ultimately underpins the next generation of truly objective measurable performance measures.
- The development of appropriate and effective metrics will require time—as well as trial and error—and research.
- Assessments and standards just tell us where we need to be, but that we also need some real mechanisms to assure accountability to ensure that public health preparedness remains at the top of people's agendas.
- Ten critical areas for performance measure development are attached.

Senator BURR. Dr. Gursky, good morning.

STATEMENT OF ELIN A. GURSKY, PRINCIPAL DEPUTY FOR BIODEFENSE, ANSER/ANALYTIC SERVICES, INC.

Ms. GURSKY. Good morning. Thank you for the privilege of being here, and thank you, Mr. Chairman, for your leadership in this area.

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 represented a profound change for the public health sector. It is a great investment in revitalizing the public health sector. It focused the importance of public health to society and to security. And it certainly advanced the knowledge of threats and understanding to the public health workforce.

I think, as you mentioned earlier this morning on the first panel, the issue of security and preparedness for threats has been broadly interpreted across our States and across our communities. There are a number of gaps that I think are quite evident. Clearly, you have mentioned some of those, the absence of significant numbers of trained workforce, a lack of good interoperable systems, technology gaps that are not giving us the kinds of real-time health intelligence, health information, situational awareness that we need to respond to events.

I think as Dr. Lurie has just mentioned, not only do we have difficulty measuring preparedness, I don't think we have clearly defined what preparedness looks like. I think we have people who say, "I have a computer. I think I must be prepared. I have a three-ring binder with plans in it. I did an exercise this year." I don't think the vision of preparedness has been clearly defined, and specifically at the local level.

The preparedness that we need to achieve for pandemic influenza, for bioterrorism, really cannot be achieved on a part-time level. We have local health agencies where we have people doing vaccination clinics on Tuesdays and Thursdays, rabies clinic on Friday, and perhaps working on preparedness Wednesday afternoons.

We need to rethink health security and preparedness for this country. We need to look at systems of governance, for collaborating the various streams of funding, how we build the workforce, and how we test and measure the performance and preparedness systems that we put in place. Thank you.

Senator BURR. Thank you very much.

[The prepared statement of Ms. Gursky follows:]

PREPARED STATEMENT OF ELIN A. GURSKY, SC.D., PRINCIPAL DEPUTY FOR BIODEFENSE ANSER/ANALYTIC SERVICES INC.

Thank you for the opportunity to respond to your questions regarding our Nation's continued investment in preparedness for catastrophic and large-scale health emergencies, including acts of terrorism and pandemics. Civil unrest and anti-American sentiment in many parts of the world and the westward movement of H5N1 avian influenza across Asia, Africa, and Europe reinforce the urgent need to develop, install, and incorporate the technologies and systems that support the earliest possible detection, situational awareness, and mitigation of diseases that have the potential to cause high rates of morbidity and mortality and to erode our economic and social structures.

Thank you, too, for your leadership and support in the areas of health security and public health. Since 2001, the United States has instituted enormous structural and operational modifications to ensure the safety of its citizens from chemical, nuclear, radiological, and explosive threats to its borders, its airlines, and its critical infrastructure. The single most outstanding threat, however, as the subcommittee well recognizes, is that of disease. In the hands of a biotechnologically sophisticated

enemy or Mother Nature, the ominous combination of novel disease and susceptible human or animal hosts can swiftly reverse increasing trends in America's lifespan and standard of living.

The legacy of public health in the 20th century recalls the sanitation efforts that controlled typhoid and cholera and the development of vaccines that eradicated smallpox, eliminated poliomyelitis in the Americas, and erased from memory the childhood scourges of scarlet fever and rubella. Seatbelt legislation reduced highway fatalities, antibiotics controlled infections, and mass anti-tobacco campaigns reduced the numbers of youth who began smoking.[1] In fact, as public health's successes reduced the visibility of disease and illness in society, the agencies erected to fulfill the public health mission were successively retasked to address non-acute health issues. With the problem of infectious diseases "solved,"[2] a large component of the primary mission of State and local health departments was refocused to address social and clinical services for the poor and vulnerable. The public health agencies now facing the threats of evolving pathogens and bioterrorism are generally ill prepared for this mission and attempt to balance these new responsibilities with an overflowing array of other responsibilities that include community outreach and health education, programs for the homeless, substance abuse services, and environmental health services.[3]

My responses to your questions reflect a broad base of research and operational experience as a clinical epidemiologist. I have held senior positions in governmental public health at the State and local levels and in the private healthcare-hospital sector. I was director of Epidemiology and Communicable Disease Control for Prince George's County (Maryland) in the days when Parris Glendening was County Executive. Subsequently I served as deputy commissioner for Public Health Prevention and Protection in the New Jersey Department of Health and Senior Services under Governor Christine Todd Whitman. In this period, from 1986 through 1998, I enacted robust initiatives to reverse high rates of multiple-drug-resistant tuberculosis, sexually transmitted diseases, and vaccine-preventable diseases (among others). I developed successful programs to build and train the public health workforce (up to 530 professional medical and public health, paraprofessional, and support personnel), implemented systems of program and workforce accountability, installed new technologies and systems, and provided the citizens whose health we pledged to protect with a rapidly deployable and responsive effort 24/7. These initiatives were successful and forward-thinking in the pre-9/11 days when bioterrorism was unthinkable and State and local public health budgets were severely constrained. By installing strong leadership, pursuing public-private partnerships, and embracing a tenet well-founded in the military—unity of effort—our successes wrought professional satisfaction, increased funding, and decreased the incidence of communicable diseases.

Since those relatively halcyon days of public health practice, I have turned my attention to studying and writing about the new demands on the public health sector within the context of 21st-century health threats. Reports I authored in 2002 and 2003 examined our response to the first deliberate biological attack on a national scale (*Anthrax 2001: Observations on the Medical and Public Health Response*) and our efforts to build the public health infrastructure with the first wave of funding from Public Law 107–188, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (*Progress and Peril: Bioterrorism Preparedness Dollars and Public Health*). Two more recent reports are based on studies of the public health sector's ongoing efforts to build preparedness capabilities and capacities. One is titled *Drafted to Fight Terror: U.S. Public Health on the Front Lines of Biological Defense* (2004). The other and most recent, *Epidemic Proportions: Building National Public Health Capabilities to Meet National Security Threats* (2005), was undertaken on behalf of your subcommittee.

By way of this background, let me preface my answers to your questions by stating my belief that this Nation must view the preparedness challenge through a new lens. Although a number of this country's 3,000 local and 50 State public health departments have made concerted inroads into revising practices and accommodating

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[1] "Ten Great Public Health Achievements—United States, 1900–1999," *Morbidity and Mortality Weekly Report*, 48(12), April 2, 1999.

[2] In the post-Depression days of the 1930s, a surge of progressivism engulfed national policy. This period of widening social responsibilities was embraced by the public health sector, which diminished its role in infectious disease fighting (especially as acute communicable diseases were viewed as a waning threat) to assume a larger role in providing social and clinical services for the poor and vulnerable. See Elin Gursky, *Drafted to Fight Terror: U.S. Public Health on the Front Lines of Biological Defense* (ANSER, 2004).

[3] National Association of County and City Health Officials, *Local Public Health Agency Infrastructure: A Chartbook*, October 2001.

the preparedness mission, it has been at the expense of fulfilling their historic social compact with the communities to whom they ensure the provision of essential healthcare "safety net" and community health services. Our Nation's governors are fully committed to protecting the health of their citizens and the security of their States. Yet it seems unlikely that, within even the next 5 to 10 years, the diversity of public health efforts and workforce capabilities resident within our 50 States can be harmonized to constitute uniformly responsive, robust, and durable capabilities to protect this country. With the preparedness experience of the past almost 5 years, it is appropriate to apply the lessons learned to our future efforts to protect the health security of this Nation. Let me elucidate further.

• Our public health departments provide—in steady state—a range of routine health promotion, health screening, and medical services to many vulnerable populations, offering invaluable efforts to screen for asthma and hypertension, intervene in substance abuse and behavioral health problems, and reverse rising rates of obesity and diabetes.[4] *Preparedness requires a rapid surge in response to investigate and identify a disease outbreak, deploy the strategic national stockpile, stand up mass immunization and prophylaxis clinics, and contain the spread of an epidemic.*

• Our public health departments aggregate the skill sets of over 24 professions, including nursing, social work, sanitation and restaurant inspection, and health education and outreach, to provide a wide range of health and human services.[5] Few have a common educational background, licensing and credentialing requirements, or formal or unifying training in public health practice.[6] *Preparedness systems must bring together the correct mix of skill sets, such as experts in infectious-diseases, epidemiology, and data analysis to rapidly identify, track, and contain disease transmission—who carry out this work in well-practiced synchrony.*

• Electronic health records will reduce medical errors, prevent costly duplication of medical services, and relieve the burdensome reimbursement process between payer and patient. *These same systems when employed for early disease detection will serve the critical needs of disease outbreak monitoring, health intelligence and surveillance, and situational awareness underpinning the preparedness and response effort. These systems will also play a critical function by linking the population health protection sector with the medical and hospital patient health sector to halt an infectious disease event.*

• Public health departments perform a vital role in crafting and disseminating health education information to promote healthy lifestyles and have been successful in efforts such as reducing teenage drinking and smoking and increasing breast and prostate cancer screening.[7] *The preparedness effort requires the abilities to swiftly craft and disseminate an accurate risk communication message to reduce further exposure to pathogens, direct exposed persons to appropriate venues of urgent health care, and convey other time critical information to impede disease transmission.*

• The public health sector has historically served the needs of the medically disenfranchised, the indigent, and the vulnerable with an unwavering egalitarian approach.[8] *The unprecedented challenges of deliberately disseminated and novel pathogens, combined with few or limited supplies of vaccines and medical countermeasures, will require difficult ethical decisions, possibly denying protection to society's most vulnerable in order to assure protection of society's most critical.*

• The preparedness mission has been broadly interpreted by our Nation's governors with respect to the perception of their States' vulnerabilities and risks and the competing healthcare needs of their constituents. *The health security of the United States requires a common strategy and uniformly consistent capabilities to detect and deter catastrophic health events and assure continued social and economic functioning of the Nation.*

The overriding mission of our public health sector is to promote healthy Americans. *The threats of pandemics and terrorism demand a system capable of assuring secure Americans.*

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[4] Ibid.

[5] Lloyd Novick and Glen Mays, *Public Health Administration: Principles for Population-Based Management* (Sudbury, MA: Jones and Bartlett, 2005).

[6] Ibid.

[7] Council on Scientific Affairs, "Education for Health: A Role for Physicians and the Efficacy of Health Education Efforts," *Journal of the American Medical Association*, April 4, 1990.

[8] As the proportion of U.S. physicians providing charity care continues its decade-long decline, the public health sector will continue to become providers of last resort for uninsured patients and those Medicaid patients rejected by or simply beyond the reach of private providers and institutions. "U.S. Physician Charity Care Continues Decade-Long Decline," Center for Studying Health System Change news release, 3/23/06; http://www.hschange.com/CONTENT/827/.

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 has provided an invaluable benefit toward increasing awareness and education about the threat environment among the Nation's State and local public health sector. To now move forward, we must shift our focus from individual local *communities* toward the health security of the *Nation*. The system required to protect Americans against 21st-century threats must evolve from and hold harmless the sector that serves traditional public health needs. The system required cannot be retrofit on top of a sector widely acknowledged to have "fallen into disarray"[9] and that has historically eschewed specific ("prescriptive") direction, guidance, and accountability from central organizations such as the CDC.[10] In fact, leadership from a higher level within HHS is required to constitute a health security system that will protect fully and equally the Nation's States, cities, and communities and that will work in harmony with other critical guardians of domestic security, such as the Department of Defense, the Department of Veterans Affairs, and the Department of Homeland Security.

The system of health security in which this country must invest, and which I humbly recommend as the focus of the reauthorization of the Public Health Security and Bioterrorism Preparedness and Response Act, will have several components.

• *Situational awareness.* The effectiveness of situational awareness stems from building on historical knowledge (such as what the background disease rates have been) with multisector, real-time, continually updated flows of new information to characterize disease escalation within a population. In most cases this approach will not demand new technologies but, rather, the systematic integration of existing technology, tools, and processes through cooperative efforts at the local, regional, State, national, and cross-border levels. These systems must be in place to serve day-to-day operations so that they also offer familiarity and scalability in the event of an outbreak. Some States and localities across the country have installed effective community-centric disease surveillance systems. Nationally, however, many fail to achieve the breadth and speed of data flows to support the widest and most timely situational awareness, to inform 24/7 decisionmaking by key leaders, and to operationalize the response of appropriate professionals. Implementing this system—one of the most critical investments toward health security—will require rigorous oversight and sustained funding. A trust fund will ensure the wisest and swiftest use of Federal dollars to fulfill this goal.[11]

• *The workforce.* The health security workforce must be constituted by experts who bring to bear the education, training, and expertise in closely allied fields and specialties focusing on the detection and mitigation of disease threats. Medical and other clinical experts (nursing, laboratory, veterinary), epidemiologists, agriculture, food, water, and environmental specialists will both analyze and intervene in disease outbreaks and atypical disease events. Most of their professions already require terminal advanced degrees and national credentialing.[12] A foundation of uniform basic training could easily be built and offered to harmonize the effort of this highly skilled workforce. Recruitment and retention of this workforce will not be difficult: Many practicing public health officials and workers have been frustrated because the health security mission has had to coexist with other demands at local and State health departments.

• *Research.* In sad fact, unlike the practice of medicine, which is guided by best practices, and clinical pathways and is evidence-based,[13] there is almost no body of research to affirm that our public health interventions and dollars expended have achieved their intended outcomes or that our monies have been well spent.[14] Empir-

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[9] *The Future of the Public's Health in the 21st Century* Washington, DC: Institute of Medicine, 2002).

[10] See Elin Gursky, *Epidemic Proportions: Building National Public Health Capabilities to Meet National Security Threats*, Findings, p. 11.

[11] Trust funds are accounts established by law to hold receipts collected by the government and earmarked for specific purposes and programs as approved by the trustee. The Highway Trust Fund was created by the Highway Revenue Act of 1956 to ensure a dependable source of financing for the National System of Interstate and Defense Highways and for the Federal highway program. Funds are reserved for transit capital projects and related purposes. See the Northeast Midwest Institute, "What Is the Highway Trust Fund?"; http://www.nemw.org/HWtrustfund.htm.

[12] The 2005 CDC/Council of State and Territorial Epidemiologist draft document "CDC/CSTE Development of Applied Epidemiology Competencies" establishes core competencies for applied epidemiologists; http://www.cste.org/competencies.asp.

[13] Center for Evidence-Based Medicine.

[14] Within the evidence-based models, there is no or little attention paid to the best practices for population-based (public) health. See the Evidence-Based Practice for Public Health Project; http://library.umassmed.edu/ebpph/.

ical evidence notwithstanding, the Federal investment to prepare the Nation against health security threats must be validated through objective confirmation of the accuracy and efficacy of our efforts. Health security must embrace a foundation of research that assesses the cost-benefit of our efforts, quantifies specific obstacles, guides the solution set, informs the interventions (medical and nonmedical) and best practices, analyzes and forecasts threats and vulnerabilities, and develops metrics for performance.

In closing, let me again thank the subcommittee for its focus on this serious concern and for the privilege of lending my voice and perspective. Few issues facing this country are graver than that of health security. As Dr. Dale Klein, Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs, noted at a meeting to discuss the Quadrennial Defense Review,[15] the issue of weapons of mass destruction, in which biology plays a large role, reflects the generational dimensions of a long war. This is true also of the war that health security experts must fight against deliberate and naturally occurring threats; the latter have resulted in 30 new or emerging pathogens in the past 20 years.[16]

The system we build for tomorrow, not that we conscript from yesterday, will lead us to successfully overcome the threats we face with the least impact on human lives, lifespan, and quality of life.

Senator BURR. Dr. O'Toole, welcome.

STATEMENT OF TARA O'TOOLE, M.D., DIRECTOR AND CHIEF EXECUTIVE OFFICER, CENTER FOR BIOSECURITY, UNIVERSITY OF PITTSBURGH MEDICAL CENTER

Dr. O'TOOLE. Thank you. Thank you for holding these roundtables, which I think are very informative and allow a lot of people the option of stating their views. If it is okay, I would like to respond to the questions the staff posed, since they were very well crafted and comprehensive. Is that okay?

Senator BURR. That is fine. I thought I would let anybody that wanted to make a general statement at the beginning to go ahead and do it and I will leap back——

Dr. O'TOOLE. Thank you.

Senator BURR [continuing]. And the next round will go specifically to the questions.

Dr. O'TOOLE. Okay. I will not turn down any opportunity to make a general statement here, certainly. My colleagues and I have been re-reading the 2002 Act in anticipation of this year's reauthorization of the bill, and we come to the conclusion again and again that this was a really good piece of legislation. It is quite comprehensive, and even in view of today's perspective, post-Katrina, post-the tsunami, et cetera, et cetera, it is a very sound bill.

Its major flaw is that it is not sufficiently ambitious. I think creating the Public Health System that you seek, Senator, is going to be the work of a generation and it is going to cost billions and billions and billions and billions of dollars. This is a national security program and we have to start thinking of it in terms of that scale. We have the scale wrong. This is not another public health program, and this is not just another mission of CDC's many important tasks. This is something entirely different. That is the first thing I would say.

Our second observation about the bill of 2002 is that when you look at why there hasn't been more progress since the 2002 bill was

[15] National Defense University, March 17, 2006.

[16] World Health Organization, "Globalization, Trade and Health: Emerging Diseases"; http://www.who.int/trade/glossary/story022/en/.

passed, one comes to the conclusion that most of the problems we have encountered, as Dr. Lurie has alluded to, are programmatic issues. It really reflects too few people with too little experience trying to do too much under ferocious pressures. We are going to have to fix this public health workforce problem and we are going to have to do it strategically, and that brings me to my last point.

We need to have a strategy for public health preparedness. We are going to have to stand up big programs. Situational awareness is going to be a system of systems, and right now, we have no vision of success. We have no strategy. We have no priorities. We are in the same predicament when it comes to building the workforce, and my third point would be that we have completely left out, for the most part, how we are going to engage citizens and using the great talent of the American people as an asset rather than worrying about them becoming a liability.

Senator BURR. Thank you very much. I might also add that one of the architects of the 2002 Act from the House Commerce Committee sits behind me and has joined us today for this roundtable. Nandan was instrumental in the crafting of that piece of legislation, so I believe in giving credit where credit is due.

[The prepared statement of Dr. O'Toole follows:]

PREPARED STATEMENT OF TARA O'TOOLE, M.D., M.P.H., DIRECTOR AND CEO, CENTER FOR BIOSECURITY OF UPMC

INTRODUCTION

The capacity to mitigate the consequences of a large-scale, naturally occurring epidemic or bioterrorist attack is a pressing national defense need. Since passage of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, the United States has achieved important, though limited, progress towards this goal. Viewed from the perspective of 2006, the aims and architecture of the 2002 Act still appear sound and quite comprehensive. But as the experience of the past 4 years has demonstrated the project of creating the institutional capabilities to care for the sick, protect the well and minimize economic and social disruption during lethal epidemics must overcome some fundamental obstacles.

This paper focuses on three fundamental aspects of epidemic preparedness:

- How to build a strong and competent public health workforce;
- How to create information systems and information exchange process that ensure decisionmakers and the public have sufficient situational awareness to make informed decisions during public health emergencies, especially large-scale epidemics; and
- How to establish an ethos and institutional capacity that engages the American public as partners in the response to and recovery from public health emergencies.

STRENGTHENING THE PUBLIC HEALTH WORKFORCE

Background

Building a 21st century U.S. public health system that is capable of managing potentially destabilizing epidemics cannot happen without a competent public health workforce. There are smart, committed people working their hearts out in public health agencies at the Federal, State and local level. But there are too few of them, and in most instances, the agencies assigned to implement the 2002 Act lack the necessary skill mix, experience and authority. Efforts to hire more people have been frustrated by the small pool of qualified candidates, cumbersome State and Federal hiring procedures, and non-competitive salaries, especially for State government positions.

The failure to achieve more significant progress towards public health preparedness in the past 4 years is largely due to inadequate program management.—i.e. insufficient leadership; poor project design and execution, including inadequate consultation and communication; implementation failures; and failure to assess progress and to redirect efforts based on such assessments. *These shortcomings are largely the direct result of too few people, many with limited experience, trying to do*

a great deal under ferocious time pressures. Efforts to improve accountability for program results by demanding progress towards poorly conceived "metrics" will not fix this problem; it will merely further burden overtaxed officials.

The Nation must make significant investments in building the public health workforce. This will require a long-term commitment to creating the educational opportunities, curricula and career paths needed to attract smart, committed people. We must take immediate steps to bring qualified health professionals into government service. And we must construct efficient organizational mechanisms to catalyze a continuous dialogue between policymakers at HHS and medical and public health practitioners in the field.

Recommendations

1. HHS Needs More Staff, More Robust Management Structure.—The problem of agencies having too few people with appropriate skills and authority to achieve critical public health preparedness goals is highly apparent within HHS and CDC. After the terrorist attacks of 2001, HHS was tasked to take on a welter of new missions related to homeland security; the management structure and staffing of HHS has not kept pace with these assignments. HHS is larger in dollar terms than the Department of Defense—and yet HHS does not have a single undersecretary. Secretary Leavitt has noted that he has 27 direct reports—a situation he recognizes as "not at all an ideal organizational structure."

Cabinet Secretaries should have broad discretion in how their agencies are organized, but I believe that Congress should approve at least one—or better, two or three—Undersecretary positions to HHS. This would provide the agency with increased senior managers capable of coordinating HHS' vast programmatic span of control. In the realm of public health preparedness, an Undersecretary for Public Health (which could be combined with the present Assistant Secretary for Health or the position of Surgeon General) could better coordinate the varying HHS programs now spread among the Assistant Secretary for OPHEP, CDC, HRSA, NIH, AHRQ, and ONCHIT. In addition, an Undersecretary would be better able to represent HHS in the interagency process.

Build a Public Health Workforce with Necessary Educational Background and Project Management Skills

There is considerable evidence that there are too few people trained in public health practice to meet current needs of Federal, State and local agencies. As long ago as 1999, the National Commission on National Security in the 21st Century (the so-called "Hart Rudman Report") warned of a "crisis in competency" within the Federal government due to a generation-long failure to recruit promising young people into government service and the accelerating retirement of today's senior civil servants. One study by an independent non-governmental organization estimated that half of Federal employees now working on biodefense-related issues will be eligible for retirement in the next 3 years. Moreover, biosecurity issues and management of destabilizing public health emergencies have not until recently been a focus of government efforts. Hence the workforce available to lead and manage biosecurity programs in particular, but homeland security issues generally has been quite small. This must change.

Long term

2. Create a program to provide tuition for students of medicine, public health and nursing in exchange for commitments to serve in government public health post.—Past experience has shown that the most efficient and effective way for the Nation to induce young people to study public health and related disciplines and to enlist them in critical government positions is to establish tuition pay-back programs. Students in medicine, nursing or public health would have their full or partial tuition paid by the government in exchange for a commitment to serve in public health positions at the local, State or Federal agencies. Students who know they are going to serve in such jobs upon graduation will act to drive schools of public health in particular to offer relevant training in public health practice.

Midterm

3. Double the current size of the CDC's Epidemic Intelligence Service, and ensure that at least two thirds of all EIS assignments are to State and local health departments.—The CDC's Epidemic Intelligence Service (EIS) was established during the Korean War as an early warning system against biological warfare. It has now expanded into surveillance and response for all types of epidemics including chronic

diseases, but provides hands-on postgraduate training in epidemiology and public health practice. Approximately 70 health professionals per year enter this 2 year program, including 15 officers from countries other than the United States. Importantly, 70 percent of EIS officers continue in public health careers. Currently however, only 25 percent of incoming EIS officers are assigned directly to State and local health agencies; the great majority work at CDC headquarters in Atlanta on a wide range of issues.

[ref: accessed at *http://www.cdc.gov/eis/applyeis/applyeis.htm,* 3/24/06].

Near Term

4. Create a special senior EIS fellows program that would provide up to 3 year assignments under IPA agreements for experienced, talented individuals from academia and the private sector who could serve as mentors and provide a stimulus for documentation of experiences in epidemic preparedness program building. Such a program would create an opportunity for experienced medical and public health professionals and seasoned program managers to work in government posts.

5. Provide funds to State and local public health practitioners to write up and share experiences with epidemic preparedness program building.—Such officials are currently too busy to document what works and what does not; consequently many localities are repeating mistakes made elsewhere and failing to benefit from others' successes. It would be useful to have both publications and a CDC Web site that could provide detailed information about program design and implementation. Expanding the annual meeting of bioterrorism directors to include program managers and frank exchange would also be most useful.

6. Reconstitute the Secretary's Advisory Council on Public Health Preparedness.—This Council provided the Secretary with advice from a wide spectrum of experts with interest in different aspects of biopreparedness and organized the successful HHS effort to refine the use of disease modeling in epidemic planning. The Council was formed in accordance with the Federal Advisory Committee Act (FACA) and as such operated in full public view. It is possible to create working groups or subcommittees that report to FACA committees, thereby ensuring transparency, but such subcommittees, which are themselves not subject to FACA, can be rapidly assembled to respond to issues as the need arises. The working groups could not make decisions themselves but reported back to the committee for final resolution and recommendations, thereby ensuring transparency. This mechanism could provide an efficient way for HHS to link to outside expertise in a variety of disciplines and across panoply of topics such as biosurveillance, hospital preparedness, countermeasure selection, etc.

IMPROVING SITUATIONAL AWARENESS DURING PUBLIC HEALTH EMERGENCIES

Background

Maintaining situational awareness during public health emergencies—i.e. an accurate, real-time understanding of what is happening on the ground and what options for intervention are feasible—is a critical function of public health. For example, during an epidemic, public health officials must be able to determine the scope of a disease outbreak, how many are sick, who and where they are, who is at risk, whether the situation is worsening or improving, what interventions to care for the sick or protect the well are viable, etc., as well maintain real-time logistical knowledge regarding available resources, their location, etc.

The 2002 Act implicitly recognized the importance of situational awareness by mandating the creation of an array of surveillance programs, including syndromic surveillance, aimed at disease detection, sharing of information among public health, the medical community and emergency response agencies, and communication with the public. A large amount of money and effort has been lavished on various electronic "surveillance systems" to unknown effect. Most such systems have focused on initial *detection* of disease outbreaks or bioterrorist attacks, not on collection or analyses of information essential epidemic *management*.

Recommendations

1. HHS Must Develop a Strategy for Ensuring Situational Awareness.—The Department of Health and Human Services (HHS) should establish a national strategy for ensuring situational awareness during public health emergencies, including epidemics. Such a strategy should include explicit goals and performance specifications to ensure rapid integration of data from different localities, including government health agencies, hospitals and other large health care delivery organizations.

2. HHS Should Explicitly Assign Responsibility for Designing and Executing Such a Strategy.—HHS should establish an Office of Public Health Information Tech-

nologies within either Office of Public Health Emergency Preparedness (OPHEP) or Office of the National Coordinator for Health Information Technology (ONCHIT) to oversee the design and implementation of disease surveillance systems and other public health data flows and to establish performance expectations for such systems and share lessons learned. Given that hundreds of millions of dollars have already been spent on such systems, and even larger expenditures are planned, HHS should establish a single office with clear accountability for ensuring situational awareness, perhaps within the ONCHIT.

3. HHS should explicitly and consistently seek input and feedback from users (Federal, State and local health agencies, health care institutions) of electronic surveillance systems and should consult and employ appropriate technical experts (bioinformatics and information technology scientists) in system design and testing.—Because these systems are so complex and costly, and because their success depends critically on local users and data inputs (e.g. hospitals) a national advisory body, perhaps reporting to the Secretary's Council on Public Health Preparedness, should be formed to provide counsel on strategic direction, user needs and means of assessing these systems.

4. Regularly monitor surveillance systems' performance.—All surveillance systems maintained or funded by the Federal Government should be subject to independent assessment by objective evaluators. State-based systems should be periodically assessed for efficacy and cost-effectiveness as a condition of Federal support.

5. Urgently establish mandatory, minimum electronic communication links between hospitals and local public health agencies.—At minimum, and as a matter of great urgency, public health agencies at the local and State level and hospitals within respective regions should collaborate to establish robust electronic communications that include disease reporting, laboratory reports and emergency department surveillance data as well as logistical information related to available bed capacity, ventilator supply, etc. *Creating and maintaining such linkages between public health agencies and hospitals should be a condition of Federal grant awards related to any aspect of homeland security.*

Most of the fundamental information pertinent to epidemic management originates in hospitals or other large health care delivery organizations. Few health agencies currently have electronic links to hospital in a region. The creation of a truly efficient information flows between public health and health care entities must await the development of a secure, nationally integrated electronic health record such as now exists in France, Britain, Singapore, Hong Kong, Taiwan and elsewhere.

6. Obtain independent evaluation of Biosense goals and cost-effectiveness.—The CDC Biosense Program, which now connects 30 hospitals in 10 cities directly to CDC, acknowledges the importance of the exchange of information between public health and hospitals. Before additional funds are invested in this stopgap system (there are plans to connect to 100 hospitals nationwide), the *specific goals* of Biosense need to be spelled out and examined in light of the actual operational capabilities. Connecting more hospitals to more State and local health agencies—i.e. linking the local response network which will actually respond to emergencies—may be a better use of funds in the near term.

7. Establish redundant communication links between hospitals and public health authorities.—Hospitals should have *redundant communication systems* that provide the capability to communicate with other regional hospitals and with public health authorities via non-electronic means. The importance of such systems was dramatically demonstrated during Hurricane Katrina. Competitive grants should be established to demonstrate innovative approaches to the design and implementation of communication links between hospitals and public health.

ENCOURAGING AND ENABLING PUBLIC ENGAGEMENT IN PUBLIC HEALTH DISASTER PREPAREDNESS, RESPONSE AND RECOVERY

Background

Recent disasters such as the Asian Tsunami and Hurricanes Katrina and Rita have made clear that in large-scale disasters community members are a mainstay of immediate response and are critical to community recovery and resilience. HHS should translate this well-documented reality into practice and establish a strategy for and administrative focal point for Citizen Engagement in Public Health Preparedness. HHS should collaborate with DHS to better coordinate and emphasize the efficient recruitment and coordination of volunteers for disaster preparedness and response.

Recommendations

1. Create an Office of Citizen Engagement within the OPHEP of HHS.—The Director of this office must have experience in disaster volunteer management, community organizing, and/or health risk and crisis communications. Functions of the *Office of Citizen Engagement* will include, but not necessarily be limited to:

- Develop a national strategy for, and evidence-based policies regarding the integration of individual citizens and community-based organizations in preparing for, responding to, and recovering from a public health emergency. Programmatic options that would contribute to an informed and involved citizenry could include but not be limited to pre-event public education and outreach, influential public participation in emergency planning, volunteer training and mobilization, and health risk and crisis communications;
- Serve as inter-agency coordinator for all Federal health agency programs that bear upon citizen engagement in health emergencies, with special attention upon integrating the diverse efforts at recruiting, registering, training, credentialing, and mobilizing volunteers for public health emergencies.
- Act as liaison between HHS, DHS, the American Red Cross and other disaster-interested NGOs (e.g., Voluntary Organizations Active in Disaster), broadening the scope of work of organizations that have a disaster preparedness, response and recovery mission to include large-scale outbreaks of infectious disease and other health emergencies;
- Provide guidance to DHS in equipping State, county, local, and Tribal Citizen Corps Councils to play a larger role in community preparations for a public health emergency.
- Serve as clearinghouse for best practices and principles regarding citizen engagement in public health emergencies and "lessons learned" from demonstration projects administered by the Office.
- Develop and offer—in collaboration with CDC, FEMA, and other relevant agencies—a training curriculum for emergency response and health officials in best principles and practices of public involvement

2. The Office of Citizen Engagement—in consultation and collaboration with DHS—will establish and administer competitive State and local grants for demonstration projects that provide "proof of principle" for active participation of citizens in public health preparedness.—Grants will require joint application from health departments, local and regional hospitals, emergency management offices, and Citizen Corps Councils. Grant recipients must devise a communications and outreach strategy for publicizing, and accepting public commentary upon, the innovative activities supported by this Federal program. Initially, HHS should fund pilot projects in 10 geographically and demographically diverse locales, funded $1 million annually for 3 years.

Priority areas include:

- Deliberative processes that solicit the public's input into the ethical and rational distribution of scarce vaccines, antibiotics, and other life-saving medical resources;
- Innovative partnerships between health agencies, hospitals, community-based organizations and businesses to handle the complex logistics of prompt, mass prophylaxis among large, diverse populations including hard-to-reach individuals and groups;
- Local and regional volunteer management systems that mobilize both medically and non-medically trained individuals to enhance the response capacity of medical, public health, mental health, and social service institutions.

Senator BURR. Dr. Kaplowitz, welcome.

STATEMENT OF LISA G. KAPLOWITZ, M.D., DEPUTY COMMISSIONER, EMERGENCY PREPAREDNESS AND RESPONSE, VIRGINIA DEPARTMENT OF HEALTH

Dr. KAPLOWITZ. Good morning and thank you for the opportunity to be here and address this important issue, Mr. Chairman.

Virginia, like New York, was enormously impacted by both 9/11 and anthrax. I came on board right after that, with the beginning of this Federal funding, and I can tell you that in Virginia, it has made an enormous difference in our planning and our efforts.

We have a unified, what I would call a unified health system in Virginia where virtually all the local health departments are part

of the State. Most of our Federal funding did go to support the local health departments to bring on a number of people—epidemiologists, planners, laboratorians—and these people have made all the difference. The need for continued funding is clear because we need to keep the people on board.

What we have been able to do in terms of key issues, we built partnerships that didn't exist before. When you mentioned who is in charge in an emergency event, it is the partnerships that make all the difference. With NIMS, it is who is in charge of what and who has the expertise to make the right decisions. So our partnerships with emergency management, with fire, with rescue, with our Emergency Operations Center, fusion center, and law enforcement, have made all the difference in the world.

In terms of metrics, clearly, we need metrics and we have been working very closely with DHS in terms of developing metrics as well as with the CDC and DHHS. But we need to assure that we have the exercises and events to test our plans, and that is really the test of preparedness.

What we have done in Virginia is used every event as an opportunity to test our plans, and we have had many. Not only have we had hurricanes and floods, but we have anthrax events very frequently, either through the Pentagon, through other Federal facilities. In northern Virginia and the National Capital Region, every event is analyzed with an after-action report. We change the plans. We use all these events as a real-life exercise, in addition to our frequent exercises, and this is absolutely essential. I couldn't agree more. It also brings all our partners into the picture when we have our exercises. These are never done solely with the Health Department or our health care partners, but with all our emergency response groups.

One other comment I wanted to make in terms of situational awareness and surveillance is the need for the close connection to the health care community. I know others have mentioned other partnerships with citizens, with business, with our other emergency responders, but it is the links between public health and the health care community that are absolutely essential on any number of levels, including identifying problems as they arise.

We can learn a great deal from data systems, from surveillance systems, but often, it is the call from the astute clinician that is going to make all the difference in the world, and building those bridges in the past few years has made an enormous difference, to the point where we are partners with the health care community. They call on us frequently. They depend on public health to work closely with them in this partnership.

The other comments were mentioned by other folks, so I will just leave it at that.

Senator BURR. Thank you very much.

[The prepared statement of Dr. Kaplowitz follows:]

PREPARED STATEMENT OF LISA G. KAPLOWITZ, M.D., M.S.H.A., DEPUTY COMMISSIONER, EMERGENCY PREPAREDNESS AND RESPONSE, VIRGINIA DEPARTMENT OF HEALTH (VDH)

Question 1. Situational awareness is based on timely lab and hospital reporting, interconnected surveillance systems, consistent epidemic monitoring and reporting, and appropriate risk communication. Currently, there is wide variability across the

country in these capabilities. How do we best make progress towards a national public health infrastructure with real-time situational awareness?

Answer 1. The most important thing would be to continue funding the infrastructure that Federal funds have allowed us to put in place over the past 5 years. Great strides have been made in the area of disease surveillance thanks to Federal support for epidemiologists, the National Electronic Disease Surveillance System (NEDSS), and syndromic surveillance systems such as ESSENCE and BioSense. These efforts can continue to be developed only with continued support at the Federal level.

With public health preparedness funds in Virginia we have hired epidemiologists in each of our 35 local health districts, to serve on each of 5 regional teams, and to enhance our central office operations. These epidemiologists are tracking and responding to the occurrence of disease daily. They have strengthened relationships with local medical care providers to ensure more timely and complete reporting of disease. They monitor hospital emergency department activity daily through our ESSENCE system for syndromic surveillance.

They also are entering data into our NEDSS system to make more timely information available statewide. These epidemiologists also follow up on reported cases of disease to prevent the spread to others and investigate outbreaks to identify and control their spread. NEDSS implementation has taken years of work, and much progress is evident. We have found that the system requires continued IT support both in terms of staffing and hardware and software infrastructure.

Syndromic surveillance systems allow public health staff to keep their fingers on the pulse of their communities, especially with respect to monitoring visits to emergency departments. We plan to use our system to help us monitor the impact of pandemic influenza, as well. Having systems in place that allow public health staff to monitor data that are already being collected in the health care system is a great benefit to disease surveillance. These systems have allowed VDH to identify and track diseases of public health importance, including cases of meningococcal meningitis, norovirus outbreaks, rash syndromes and animal bites, that either may not have been reported or reported many days after the event.

Additional systems could be built based on the syndromic surveillance model, that help us collect the same sorts of information from other parts of the medical care system, such as private physician practices and hospital admissions. That would allow surveillance to be conducted in various outpatient and inpatient settings.

States strongly believe it is vitally important that local and State health departments be involved in the initial receipt and interpretation of disease surveillance data. Local public health workers need to act promptly on reports received to verify the diagnosis, intervene to protect the contacts of the ill individual, and gather information to determine potential sources of exposure. Surveillance is not just about counting; rather, it is an important tool that allows us to act to protect the health of communities by responding immediately at the local level to prevent the spread of disease. Additionally, we ask Congress to realize that local and State systems have been built to detect the occurrence of disease and it is not efficient or effective to scrap these systems only to replace them with others that may not provide as much information as needed at the local level. A great deal of good work has been done in disease surveillance in recent years, and we ask you to please help protect the public health infrastructure that has been built.

Common operating picture and realtime situational awareness require that everyone has the same accurate information at the same time, as well as interoperable systems to assure that this happens. This can be accomplished through close collaboration among localities, between localities and States, among States, as well as between States and the Federal Government, using interoperable systems. These systems need to use established protocols, must be based on sound science, assure timeliness of information sharing and safeguard patient privacy and security.

In Virginia, the Virginia Department of Health collaborates closely with the Virginia Department of Emergency Management and all other response agencies and organizations, both public and private. VDH works closely with the Virginia Office of Commonwealth Preparedness, is an active member of the Commonwealth Preparedness Working Group and has close links to Virginia Fusion Center and the Emergency Operations Center, assuring that information essential to public health and safety is shared among all response agencies in Virginia in a timely manner.

Question 2. How do we recruit, train and retain a prepared public health workforce with the ability to respond to national threats—whether acts of terrorism or by Mother Nature?

Answer 2. The ability of the public health system to respond adequately to potential terrorist events, emerging infectious diseases, and other public health threats

and emergencies depends on a well-trained, diverse, and adequately staffed public health workforce at the Federal, State and local levels. Recruiting, training and sustaining the public health workforce is the preparedness crisis. Some States are experiencing retirement rates of up to 45 percent over the next 5 years. The average age of a State public health professional is 47. The current scenario is a rapidly aging workforce that will experience high rates of retirement over the next 5 years with no clearly identified source of qualified public health professionals to fill the void.

ASTHO urges you, in the strongest way possible, to include the provisions of the Public Health Preparedness Workforce Development Act of 2005 (S. 506) in your reauthorization legislation. This bill would provide incentives for health professionals to enter the practice of governmental public health, ensure these individuals commit to a designated number of years of service in public health agencies, and help to retain current employees in the field of public health.

We continue to face new challenges each year, from anthrax to smallpox to SARS to pandemic influenza. One of the lessons of Hurricane Katrina is that we cannot focus too narrowly on specific threats. Instead, an all-hazards approach is needed. We must ensure that essential public health resources—personnel, laboratories, surveillance systems, communications, well thought out response plans—are available to address ongoing and new public health threats.

In Virginia, the biggest challenge has been recruitment and retention of experienced epidemiologists, laboratorians and information technology experts. Nationally, there is a shortage of all 3 groups of professionals; in addition, States frequently cannot match the salaries offered by the private sector. Virginia has used national searches and advertised multiple times for successful recruitment of epidemiologists and scientists. In addition, continued training has increased the expertise of epidemiologists, resulted in increased job satisfaction and improved the chances that people will continue to work within the Virginia Department of Health. Laboratory scientist positions have often been difficult to fill; the excellent reputation of Virginia's State laboratory has assisted with recruitment.

Many positions in VDH's Emergency Preparedness and Response Programs have been filled by people making mid-life career changes, often from the military but also from local government, health administration, and non-profit groups. This has resulted in an influx of people who have little or no background in public health. In Virginia, this influx has been valuable for EP&R as well as for the Virginia Department of Health in general, bringing both needed expertise and a broad range of emergency response experience. Those who have come to VDH from other areas have developed a strong commitment to public health in general, as well as an interest in linking public health to the healthcare and emergency response communities at both State and local levels.

Question 3. How do we develop public health systems research, paramount for developing evidence-based best practices and benchmarks, for an all-hazards public health response?

Answer 3. No reply.

Question 3a. Do issues ranging from disease forecasting to financial modeling of Federal and State public health investments need further study?

Answer 3a. Yes. Research in public health preparedness must involve close collaboration between Schools of Public Health and State and local health departments to assure that research findings are applicable to public health preparedness.

Question 3b. How is "public health preparedness" best defined and what are the metrics for measuring success?

Answer 3b. ASTHO supports the development and implementation of performance Metrics and measures to assess progress in preparedness. Accountability is essential and best measured against a limited set of performance measures that are evaluated over time and flexible enough to allow States to match their individualized strategic plans to national goals. State and local public health has been very involved in assisting the Department of Homeland Security in developing Performance Measures for the 37 Target Capabilities List in accordance with HSPD #8, as well as working with the CDC on specific grant performance metrics. In many respects, this is uncharted territory, requiring full engagement and collaboration of all disciplines, relevant agencies and levels of government to minimize the potential for incomplete, conflicting or "siloed" performance measurement tools and processes that fall short of the mark.

We must look beyond metrics to be certain we are also using effective performance measures. The best method of determining if an emergency response plan is effective is to test it under real or simulated emergency situations, during actual emer-

gencies or well-designed exercises. Each event or exercise must be followed by a full after action report, which results in appropriate changes to plans that will then again be tested through real events or exercises. Exercises must be structured so they stress the response system, as well as collaboration with other emergency response agencies and organizations, in order to serve as effective tests of plans. In Virginia, exercises are planned and implemented by VDH staff, with very infrequent use of consultants. As a result, Virginia has built extensive internal expertise in public health emergency response.

Successful public health preparedness and response requires the recruitment and retention of qualified public health professionals to be knowledgeable about public health, emergency response plans, as well as incident command and NIMS. This is not possible in an environment where there are concerns about the future of program funding. I cannot emphasize enough how important it is that Federal bioterrorism and emergency preparedness funding to State and local health agencies be predictable and sustainable.

Senator BURR. I am going to ask for the indulgence of our panel for two minutes for a slight interruption while I go make a telephone call that I just got e-mailed on, and it will be no longer than that, so if we could, we will temporarily suspend and I will be right back.

[Recess from 11:07 a.m. to 11:09 a.m.]

Senator BURR. I thank you very much.

I know that staff provided three questions to everybody, and if I may, I would like to go down those three and anybody who would like to respond to the questions in order, please feel free to do so. In addition to that, I am going to have some other questions that I would like to spend the remainder of the time attempting to mine down for my own purposes, such as, specific information that we are either looking at, considering, or in response to potentially something that you or others have mentioned today.

The first question on situational awareness is based on timely lab and hospital reporting, interconnected surveillance systems, consistent epidemic monitoring and reporting, and appropriate risk communications. Currently, there is wide variability across the country in these capabilities. How do we best make progress toward a national public health infrastructure with real-time situational awareness? Is there anybody who would like to tackle that?

Tara.

Dr. O'TOOLE. Well, I think situational awareness is one of those core functions that is essential to responding to all hazards. I also think that it is going to be very difficult to achieve the kind of situational awareness across the country on local levels as well as the Federal level that we need, and this is an area that is really ripe for an overall national strategy. I think we wasted a lot of money on various kinds of surveillance systems as people in good faith tried to invent different sorts of syndromic surveillance systems and put systems in place that weren't well thought out.

I think what we need, first of all, is a national strategy. There ought to be an office in HHS, not in CDC, that is responsible for creating a national surveillance system at all levels and over a period of time, and that program ought to be accountable for building the systems we seek, and there ought to be priorities as well as a very rich interconnection between that office and the private sector and the users of these systems.

We have seen with the FBI how difficult it is to build these electronic systems, and what we need in terms of situational awareness electronically is going to be bigger and more complicated than

anything the FBI is trying to stand up. Asking CDC to do this or asking State health departments to do this is crazy. It just isn't going to work. Some places are succeeding. New York, for example, is making progress, but the places that succeed are either going to by happenstance have great IT expertise on board or they are going to have more resources than others. So we need to figure out what the priorities are here and how to put them in place.

My first priority is to connect, as Dr. Kaplowitz said, public health to the health care sector. We ought to set a clear date, I would say no later than 18 months from now, for connecting all hospitals to State public health agencies so that we can at least flow real-time data about patient census, about bed logistics, and about laboratory reports from the hospitals to public health. That, I think, would make more difference in terms of our ability to manage an epidemic than any other kind of connectivity we could do, and we could put that in place.

I would not spend another penny on Biosense until we had a very clear notion of what the strategy for Biosense was and what it was going to get us. Right now, it doesn't make sense to me to connect CDC to the hospitals before we connect the locals to the hospitals. It just isn't going to give you much more operational reach, and I think right now it is confusing the hospitals, who are being asked by CDC and then by their locals to connect their systems and it is basically dissipating our resources.

But we need a strategy and we need a way of getting the best minds in IT, which America has, working on these programs, and we shouldn't lay the burden of designing the programs on local public health. That is a strategic error.

Dr. LURIE. I concur entirely with Tara's comments and maybe want to amplify this a little bit more. In addition to the technology needs, we still have to remember that the health care provider and the public are the first lines of defense. They are probably not going to be as hooked into the technology for a very long time as we want them to be, including the health care provider who sees a patient in a clinic. I think it is okay to get hospitals linked in, emergency departments and laboratories linked in, but if you look at almost every event, as Lisa said, it is the astute clinician who makes the phone call.

The second thing I want to highlight is that we in America have this incredible infatuation with technology, and technology alone is not going to be sufficient here. Look at what happened in Katrina. Our power was out. Our phones were out. Our satellites were out. We have got to have a system in place that has adequate backup so that if we have another disaster like that when everything is out, we are not so dependent on the technology that we can't function. I am a little bit worried that we are throwing away some tried and true things that probably need to remain in place while we build the system of the future.

And finally, I just want to say I entirely agree with the comments about Biosense. I wouldn't spend another penny on it, either. Bypassing State and local health departments, I think is problematic. There are huge problems with data quality. Many public health departments, as you probably know, refer to it as Bio-Nonsense, and we have a long way to go before we get that right.

Senator BURR. I was asked to speak at a tabletop held by Speaker Gingrich last night. I started off my remarks by saying, have you figured out how to design a model that at any given point in time, 40 percent of the employees won't be there?

And all of a sudden, the reality sinks in that everything that you would design—it is sort of like looking at the model of New Orleans and saying, "Would you have ever designed something that addressed the degree of flooding?" Only at a real weird moment would you have thought something like that could happen. Should we? Maybe so.

The question is, don't replicate the same mistake by not being creative enough as to what can happen. I think the only true mistake that we could make is to design a response to pandemic flu or a response to anything that doesn't take into account the realities of what we know the effects might be on the population. The population can't just be those people who work at a given location. It is everybody across the board.

So if you look at the general population and say at any point in time, 40 percent cannot attend, that is 40 percent of law enforcement. That is 40 percent of health care workers. That is 40 percent of public health workers. It is 40 percent of everybody and the system has to be designed to take that into account. If not, the system fails.

Ms. HONORÉ. Just to follow up on your excellent comments, that are very well taken because in Katrina, a vast majority of the responders were also victims themselves who still had to respond.

The other thing that we shouldn't forget is that during Katrina and during some of these other potential emergencies, the communications systems may just be broken. I mean, there is no electricity. There is no way to communicate. The phones are down. The satellite phones are down. So if we are talking about the situational awareness, we have to take into consideration the infrastructure of how those communications will happen when everything is just as Ms. Honoré has said over and over and over again, they are just broken. There are no lines of communication.

Just a few other points, but not to elaborate too much on what everybody else has said, but there has been significant accomplishments at the Federal level. But I think what hasn't happened is the research and the evaluations to determine best practices or to facilitate course corrections as we go through that, and some of those questions might be, what is the impact of the State and local public health organizational structure to actively effectively implement the situational analysis systems?

Other things that were mentioned is what are the metrics to determine organizational capacity within the agencies themselves? Workforce competencies stretch all over the place in State and local public health. We simply don't know what those are.

Senator BURR. Doctor.

Dr. KAPLOWITZ. I just wanted to expand on comments made about dependence on information technology, on IT and on systems, electronic systems. I am a definite believer in electronic systems, especially when they are interoperable and we can talk to each other, not only within health departments, but across agencies. However, so much depends on our people and I just want to put

in a plea that we have been able to bring on an incredible amount of expertise with this funding, epidemiology and planning and laboratories. Those epidemiologists at the local level make all the difference in the world. They analyze the data at both the local and the State level. They are the ones who trigger the immediate response.

I just know in Virginia, if we were to lose that expertise, those personnel, it would make an enormous difference in terms of our response. They have made all the difference in rapid response to any number of situations—rash syndromes, infectious disease outbreaks, influenza situations. So I wanted to put in that plea that while we build our electronic IT systems, that we make sure that we have the people who can analyze the data and who can generate the rapid response.

Senator BURR. Dr. Caldwell, you are a little outnumbered here, aren't you?

[Laughter.]

Dr. CALDWELL. Well, I feel that we are all colleagues and hearing some of the comments, I sense that we are all coming at this with the same viewpoint.

I want to answer the question about situational awareness with my experience regarding the whole concept of syndromic surveillance. I think there are a bunch of smart people who thought that perhaps, in looking back maybe at intelligence issues, that if we had had some threat or some clue before those planes hit the World Trade Center, perhaps we could have intervened and prevented them. Well, now translating that into bio-surveillance, perhaps we can look at all of this data and find some clue or some evidence that something is going on and we can intervene to prevent either a manmade or a natural catastrophe.

This is really research that ultimately, I think, its value is unknown. As a physician, we would always do drug studies and we would find out that, oh, if you give this certain drug, it helped this person such-and-such amount. But the next question always was, well, what is that clinical significance? It may help your joints move a little better, but what is the clinical significance?

And I ask you, what is the real significance of getting all this data? What really is it going to do for us if there is an event? Are we really going to detect something early enough? Nobody knows, but yet we are funding and putting tons and tons of money into trying to get data, data, data. We don't know really what the data is. We don't know what we are looking for.

And that is another question. What are we trying to detect? What are we looking for? Maybe stomach upset, maybe shortness of breath.

I would challenge all of us to think of a house burning in a community. What happens when there is a house burning? Maybe somebody smells a little smoke. Maybe somebody sees something in the distance. But suddenly, somebody calls and we all respond, and Senator, what is lacking in our conversation today, but I hear pieces of it, is the concept of bio-response. We have Biosense, but we need a bio-response. And that is a concept that the public health officials across our country do every day. But we need to invest more in it.

We have heard my other colleagues saying that we need people to respond. We know when to respond, how to respond, and respond in a coordinated way, not just the health guys but in a coordinated way with our other partners. When you look back at our true victories in picking up public health problems, what did it come down to? An astute clinician, an astute clinician who is able to see something, call up the local health department, knew who to call, knew who to call quickly, 24 hours a day.

When I had a case just in November of a girl, 19-year-old girl at Marist College, the emergency room infectious control nurse immediately called the communicable disease unit of my department and said, "I have a case of meningitis here." We immediately went into action, tried to help that family, immediately identified the contacts to try to give out antibiotics.

So I think we need to hear more about bio-response. I think getting all this data is interesting academically. I would like to have it. I am not sure what we are doing with it. We need to certainly integrate it more from the CDC down to the local level. We are building relationships from the local hospitals and doctors to the local health department and the State. We need to integrate all of this, and I think this is something that I have heard some positive comments from Dr. Besser today about the concept of leadership training and trying to focus more on having strategic integration of our work and our daily activities. But I would like to see more on bio-response, which is a commitment of workforce as well as continued training.

Senator BURR. Let me assure all of you that we will work with Dr. Besser to better understand where we are headed and potentially what the objective is at the end of the day. When I said that you have to put a plan together that takes the element of surprise out of it, one of the obvious things is, what if a clinician—what if a health care professional doesn't initiate the call? They have got the symptoms, doesn't initiate the call. The clock hasn't been started. Somebody hasn't been notified. Whether that is CDC or whether it is local public health, how long is it before then the system picks it up?

I think to some degree there is a tendency up here for us to try to take as many elements that are unpredictable out of the equation and build in some degree of predictability. I also understand the frustration on your part that we have seen this tried and, in some cases maybe more than others, have been unsuccessful and we don't want to replicate a model that has a likelihood of being unsuccessful.

Ms. Gursky.

Ms. GURSKY. I think the issue of information and information systems has been one of the most fundamental concerns over the past few years. It is a source of great opportunity and it has been a great source of frustration. There were monies put out before there were requirements about what should be built. We have made a lot of mistakes. We have, unfortunately, wasted some monies. We have, in some instances, put the cart before the horse in terms of wanting to collect more data than is actually usable or practical.

I would like to go back to what Dr. O'Toole mentioned, which I think is really fundamental to where we need to go forward, which is a national approach for figuring out what it is we really need, how we take what we have in existence and use that to make interoperable systems.

There is nothing that is going to replace the phone call from a clinician, but obviously, that is not always going to happen. We really do need these systems. They are ultimately profoundly useful for a number of reasons. But the approach has got to be coherent. It has really got to be national. It has got to be led by experts who know what data, how to stream it, and how to use it.

I think Dr. O'Toole's timeline is very important. I think we need to catch up with the time that we have perhaps not taken the best advantage of, but let me echo Dr. Caldwell and Dr. Kaplowitz's comment. Eighteen months from now, when hard, usable data comes into health departments, there has to be someone on the end who knows how to use that and make informed decisions.

Senator BURR. Well, clearly, our reauthorization deadline is before those 18 months and I think we have been given the task to try to sort through all these issues that have been raised today and in other conversations in hopes that we can present a legislative blueprint for how we go forward, and hopefully it addresses in many cases a lot of the issues that you have raised and hopefully provides additional insight for the CDC or HHS or DHS relative to how the pieces need to fit, or at least how we envision it.

Whether we, in fact, achieve that depends on whether we will get a reauthorization and that involves a tremendous amount of work between the House and the Senate and the administration, and that is why I am delighted that we have got representatives from the House here today.

Let me raise one question. I know you had your hand up. I think this is an opportune time for me to ask this and I would appreciate a very quick answer. Is there a disaster that is raised to a degree where the Federal Government automatically trumps State and local response? Yes, ma'am?

Dr. KAPLOWITZ. I am not sure the correct word might be "trumps." We actually——

Senator BURR. Let me state why I have asked the question. Everything from Dr. Besser to, Tara, your comments about the timeline that we have, if we are going to talk real-time, it has to be real-time. In the case of Katrina, if there had not been a 48-hour period in Louisiana where there was some deliberation before the request for Federal aid and you had expedited the Federal response by 48 hours, you would have been within the window of response where chaos did not break out. The challenge was still the same, but I think most of the additional obstacles that were created after that 72-hour period might not have existed. I realize we have a constitutional issue here, so I am not trying to debate the Constitution.

Dr. KAPLOWITZ. Well, I was going to use as an example an exercise that we participated in a year ago August that was part of a Federal exercise. It was designed to immediately overwhelm local and State systems. It was Determine Promise with thousands of deaths and casualties. What I took away from this is that you

weren't going to have a situation where the Federal Government was going to come in and still run things. You could call in the resources faster, and we needed to call on them almost immediately. But still, you had the local response, you had the State Emergency Operations Center really being the source of incident command for the response at the State and then the same thing at the local level.

So I really thought of this as calling on the Federal resources much more quickly so you could coordinate it better, and yes, bring in resources more quickly. But I still felt that it was valuable to stay with the emergency response systems in place, where you had the localities really deciding how things were going to work at the local level, the State coordinating things on the statewide level, the Federal Government, and we had the Department of Defense bringing in their resources at the same time, which is why I question the comment of trumping.

I think we have the command system in place to work at all levels, to bring in resources at all levels, but still not have a Federal control in that sense, which is really what I was trying to focus on.

Senator BURR. Well——

Dr. KAPLOWITZ. There is one situation with the command system and then calling in the resources.

Senator BURR. In full disclosure, I am trying to flush out this issue of who is in control from all different angles right now.

Tara.

Dr. O'TOOLE. I know that Richard Falkenrath at your hearing a couple of weeks ago suggested that in the kind of large-scale calamity you bring up, the DOD ought to be in charge. You know, beyond a certain scale of badness, you put DOD in charge. I am sympathetic to Richard's longing for operational competence in a catastrophe such as Katrina, but I think it would be a big mistake to assume, to plan to put DOD in charge whenever we have a big bad thing happening.

I think what we are confronting for the first time in our history is the need to consider very large-scale disasters largely as a consequence of the terrorism threat, but also because of natural disasters that can now afflict millions of people at one time, and we have to rethink federalism.

In reality, if you look at what happened with Katrina, I think we are going to find as we piece the response together that a lot of what happened to the good happened at the local level. It wasn't well connected, but beyond the locals, what you got was contiguous States and other States bringing resources to bear.

We have found in the medical response that lots and lots and lots of hospitals and States wanted to offer help, but couldn't plug in. What the Feds have to do is create the capacity to plug in, and that is where they ought to be focusing on.

But I don't think we want the DOD to suddenly become everybody's responder in cases of dire need. I think we have to get ready to have contiguous States more able to move in and I think we have to have much more robust communication systems across the board so we know what is going on, situational awareness again, and where the resources are and how to deploy them.

Dr. LURIE. I think the answer to your question also depends in part on what kind of a disaster we are talking about. Clearly, if we are talking about a localized disaster, even if it involves lots and lots of people, it is pretty different than talking about a national disaster. Where it is feasible for Federal assets to go to one or two locations, it is not feasible for the Federal Government to go to and run a response everywhere in the country, or in half the country as you might, let us say, in pandemic flu. So I think we have to be careful not to tar all of this or paint all of this with the same brush.

Another thing I would say is that in all of the work that we have done on exercises, two things really make the difference in response. One is leadership. The other is practice and partners knowing each other.

When you look at real events and places where people have gotten into trouble, and we have had an opportunity to look at some of those, it has been where partners don't know each other. It has been where people don't practice together.

And so thinking that you are going to have Federal assets and people who don't know each other come in, not know the lay of the land, not know the people, not run the show, they are going to spend a lot of time wasting time, duking it out about who is in charge and making a lot of mistakes and missteps because you don't have those relationships built. The investment needs to be in building and maintaining and practicing those relationships over and over and over again. In this case, I think practice makes perfect.

Senator BURR. Well, as a resident of North Carolina, I can tell you that there are two reasons that Florida and North Carolina passed the threshold for preparedness, and they were the only two in the country, and that is because we annually not only have a plan, but we practice it. Virginia is close behind us because usually if it comes across our coast, it is headed for Virginia eventually, just based upon the weather trend.

Let me move to the second question, if I can. How do we recruit, train, and retain a prepared public health workforce with the ability to respond to national threats, whether acts of terrorism or by Mother Nature? I think some of you have answered pieces of that in your opening statement. If there are additional comments that you would like to make, we will certainly entertain those. Yes, ma'am?

Dr. KAPLOWITZ. I want to make a comment about shift in culture, which is what I have been seeing within the Virginia Department of Health. As of 2001–2002, it wasn't the culture to be part of an emergency response, and that has changed dramatically over the past 3 or 4 years. Part of that culture is to make it clear that everybody is going to have a role to play in an emergency. This isn't going to be just those folks funded with these emergency response funds, which I think was the perception initially, but this is going to involve everybody who is in the health department, whether it is at a local or State level for us.

And again, a lot of this is a perception. A lot does depend on training, bringing people on board so they understand systems of response.

And in terms of having a devoted, educated workforce, the need for continued funding is going to be key here because people won't stay in public health if they sense this is just going to be a temporary commitment. We have brought a number of people into the Virginia Department of Health from outside public health. Many came from the military, some came from local government, some came from the private sector, some came from nonprofits because of their expertise in emergency response, and in a sense, we have melded cultures that way. It has been valuable for us. It has been valuable for them to really get a handle on everything that public health does.

Senator BURR. I am curious, when a student today considers a public health career, what is their perception of such a career? In North Carolina, UNC School of Public Health is not only one of the best in the country, but it had one of the best directors when Bill Roper was there. He is somebody who has a handle on it, and this is a question that I have written down that I am going to ask him, but I am curious as to whether anybody here has a perspective on when someone decides to have a public health career, what do they envision that being today?

Dr. LURIE. Well, before I was at RAND, I actually taught in a school of public health and I would say that it was the rare student who envisioned themselves working in a State or local health department or even at the CDC. Students who went into public health by and large envisioned themselves working in the private sector, working somewhere in the health care delivery system, working in a foundation, working in research, did not see themselves at the front line working in a health department, and I think this is something that has to change.

I think if they saw themselves working in that role, they saw the fact that this would be a training ground for 1 or 2 years that they would then get gobbled up by some other place where, frankly, they could be better paid, where they wouldn't have to work in a difficult bureaucracy, and where they thought that they could have more of a population health impact. I think right now the model and the vision of what people are preparing themselves for, what they are going to go into, is pretty backwards.

One of the other things that we didn't really talk that much about is we talked about the fact that the funding needs to be stable, but also that the jobs people go into are at least competitive and on a level playing field with the private sector. People who work in public health departments now are awfully altruistic to do this.

Senator BURR. I would be the first to tell you that I am not sure, given all the pressures in health care today, that one can look at something as aggressive as I think we are going to look at and say, "by the way, there is going to be pay disparity that exists for this type of career more than anything else in the private sector."

I am trying to get at what the expectations are of somebody who decides they want to go into a career of public health and where we lose them or what the enticement is that draws them away. Clearly, you have addressed the salary, and I am curious as to whether we have got a dedicated pool of students that go into public health for what typically the role of public health was, and that

was to be the tip of the spear, and depending upon where they end up may determine what type of public health they actually go into. I am getting back to the need for us to replicate a public health function around the country that is all the same.

Dr. O'TOOLE. I think people go into public health with one set of aims and they come out with another. I think they go in very altruistically, either wanting to do research, wanting to get answers to problems. I was a practicing physician, who got tired of bringing teaspoons of water to the ocean and got interested in more preventive approaches. But when you come out, you enter a market-driven economy and there aren't many jobs for public health practitioners, and throughout most of your experience in public health school, you don't hear about public health practice. You are being taught by people who are primarily doing research, which is fascinating in and of itself. So people come out and they look at where the jobs are and they go into health care administration or research, by and large.

The most cost-effective way to get the public health workforce we need for practice is tuition payback. If you pay people's way through public health schools or through schools of medicine or nursing—telling them, when you get out, you are going to owe an equal number of years in public health practice, you have got to go work for some level of government, they are going to change the curriculum in the schools of public health. This happened with primary care in the U.S. Public Health Service. Medical schools suddenly started paying attention to family practice and internal medicine and primary care. I think that could happen with schools of public health, as well.

It gets around the problem of—please guarantee us we are going to have funds at the State level for the next 5 years to keep our people in place. The Congress isn't going to do that, we all know that. But if you had a tuition reimbursement in place, you would have not only this market-driven shift in what is being taught in schools of public health, you would have a stream of people that you knew were coming out and looking for jobs. That would change things, I think, fairly fundamentally.

Ms. HONORÉ. One of the things that I would add to some of the excellent comments that have been made already is that we need to develop and implement strategies taken from other professions in order to attract people earlier on in their career. For instance, like pharmacy and engineering, they have partnered with even the community college to develop joint doctorate-level degrees to get people early on in their career.

In public health, the Master of Public Health, the M.P.H., is touted as the entryway into the field. Well, in the Mississippi Department of Health, 60 percent of our workforce has no Bachelor's degree. Forty percent have no college. If the M.P.H. is the entryway to public health, how do they get from no degree to an M.P.H."

Senator BURR. Dr. Caldwell.

Dr. CALDWELL. I think the key word here is incentives, but it is also, I think, to have inspirational mentor leadership that is visible in a way to get people interested and motivated to do what is really community service. Typically, public health has a difficult time defining itself because we don't have one particular uniform. We are

not as identifiable as our police and fire colleagues and even our clinical colleagues, as well, so——

Senator BURR. Do you feel that as we reauthorize bioterrorism legislation that it is incumbent on us to define public health for the future?

Dr. CALDWELL. I don't know if that is ever achievable because——

Senator BURR. It wouldn't be the first time that somebody has given us something that wasn't achievable——

[Laughter.]

But in a perfect world, do you see that as beneficial, I guess I should say?

Dr. CALDWELL. I think that there are a number of groups that have worked to try to define that as best they can in the context of redefining this particular legislation that you are trying to reauthorize. I think it is certainly something that you can take from the previous work that has been done in trying to define public health specifically for emergency preparedness in this regard.

But I think what I am most concerned about is the recognition that the people who come to serve in public health come from so many different parts of our society, from so many different training paths, and I think that actually is a strength of public health, that we do have so many. What the weakness is is that we have not had a unifying, overarching connectedness.

But I can tell you, and what we have heard here is that the culture is changing in our departments and across our communities. The unification now of what public health is, at its core, is that we are there to serve the community in a time of crisis. That is new. That has never been there before, and that can blend my lawyer colleagues, my physician colleagues, the epidemiologists, the engineers, the restaurant inspectors. We all put on blue shirts when we do a drill. We are all together. And to me, I would have done this just as a team-building exercise. But now, we all recognize we are connected.

Before, even within the departments of health, we would have the nurses over here and the environmental people over there, and they do their programs and they would respect each other and they would all realize they were experts and they also knew they didn't know what the other person really did, but they knew it was important. But now you take a step back and you can create this unifying, overarching effort. I think that is perhaps your way to solve the challenge of defining public health.

Senator BURR. In the past 5 years, what do you consider the most significant advances of public health, and in the next 5 years, what do you think should be our specific objectives in public health?

Dr. CALDWELL. Clearly, in the last 5 years, there has been an awareness that we are the ones to stand up to the challenge. There is an expectation among other community partners that we have to be shoulder-to-shoulder with them. The resources that we have received, the $1 billion or so to State and local public health departments, have been indispensable. I think we sold ourselves short, though, when we came up with the $1 billion at the time. If you recall, the first allocation that we had from this in 1999 was

about $36 million. So when you jumped us up so high, we knew the civil service infrastructure we were going to have to deal with to try to get us to where we needed to be.

But we had a vision, and I think over the last 5 years, we have built the framework of a system that we can carry forward, and I think a lot of good has happened and I think this has really been a tremendous advance.

But the next 5 years, I think we need to, first of all, send the message that we value the success of the past 5 years and not start reducing that level of appropriations that is going to this effort, which we saw trickles of and we were concerned about it. But we need to strengthen that and continue to have strategic exercises community-wide, not just public health departments, but every single community drill to include as many partners as possible so that we can learn from each other.

So when the fire people are doing their fire drill or the police are doing their police drill, we should have more of an integrated approach for all the types of drills so we can learn better from each other, and I think that is the challenge that lies ahead of us.

Senator BURR. Dr. Honoré, if I remember correctly, Mississippi had a system in place to track hospital beds, and space available. Given the experience with Katrina from a public health standpoint, how valuable was that to you as a public health entity?

Ms. HONORÉ. That was exceptionally valuable to us, particularly given the situation on the Mississippi Coast where for quite a few number of days, the hospitals had to close down. Some were flooded out. Some were just destroyed. So that was immensely valuable to us during that crisis. Some of the other situational analysis and bio-surveillance capacities that we have put in place also would be the availability for exposure, identification, and data collection within all 480 of the ambulances in the State and all 75 hospital emergency rooms, as well.

Senator BURR. Dr. Lurie, from your specific research and analysis, what are the two highest priorities that need attention with regard to public health preparedness for the 21st century?

Dr. LURIE. I guess from my perspective, the things that are most in need are some of the things we have talked about today. We have got to get the IT infrastructure right, and I think that remains critical and will be transformative ultimately to all of public health.

The other pieces, I think, are in the short term really dealing with these workforce competency gaps and issues. I think the issue about leadership is absolutely critical and I think that the issue about how you improve, and I was really delighted to hear Dr. Besser talk about the goal of learning and improvement. But how you do it is really tough.

Senator BURR. Dr. Gursky, what do you envision the 21st century public health system to look like?

Ms. GURSKY. Thank you for that question. How many hours do I have to answer this?

[Laughter.]

Senator BURR. I felt like I had neglected you.

Ms. GURSKY. Not at all, no. I have been enjoying all of the discussion and excellent points by my colleagues and your very thoughtful questions, sir.

I believe that what a 21st century public health system will look like in the next few decades will be exactly what 50 governors and 3,000 mayors want it to be, to serve the purposes of providing health care and safety net services for its populations, ensuring better access to health care, improving health care status. What I would like to hope it would be is large enough, resourced sufficiently to be able to support the health security and preparedness mission.

I think it is going to be very tough to do both simultaneously. I think that the health care needs of 300 million Americans, many of whom don't have good access or don't have insurance, is going to require continued reliance on public health departments for their health care and that it is going to be tough to put the preparedness mission further on the tip of that sphere.

I am hoping as you reauthorize legislation that—and I do offer whatever assistance I can provide—that we look at how those two missions can coexist, how we clearly define the vision so we can put in place the right information infrastructure, how we recruit the expertise and the workforce we need for these specific tasks so that when they get information, they do respond quickly and appropriately, and that we get better in our measurement so that we can come back and tell you, this is what it costs. This is what we are going to need going further to assure you a secure America, to secure all Americans a secure America.

Senator BURR. Well, that is ultimately the task in front of us.

Dr. O'Toole, I sort of took from your opening comments that we are very much crisis-to-crisis driven from a standpoint of how we look at public health. I am curious, what do you think it takes to knock us out of that crisis-to-crisis management mode that we are in and one that is focused on the creation of a permanent model that is almost plug-and-play, that allows us to take whatever the thread is and plug it in and know that the system works?

Dr. O'TOOLE. I think it is going to take a really calamitous crisis. I think America is going to be very reluctant to spend their treasure and resources on this until it is very clear to those 3,00 mayors and 50 governors and the entire U.S. Congress that that is what we need to do. I think that will happen. I think the reality of this age is that we are very vulnerable to naturally occurring epidemics and to bioterrorist attacks, and I think the future of public health is going to trend in the direction of the rest of human activities, toward ever more connectedness, and I think we will get to that kind of plug-and-play piece that you are looking for, but building the systems that undergird that and the willingness to figure out what those systems are, I think is going to have to take a sea change in political consciousness in America. You accept it, of course, Senator. But I really think we are still operating on erroneous presumptions of scale.

Senator BURR. Thank you. Last question, and a short answer, if you will, but it is an easy one. How do we retain public health workers? We talked about how tuition forgiving might be a way that we attract people. You are out there. How do we keep them?

Dr. KAPLOWITZ. Well, I am going to give a more general answer. I think that a key thing that public health has to do is educate the community on what it does, and the community meaning from the individual level, to local, and all the way up to all our partners dealing with security, because public health will be valued in the sense that it is viewed as being valued. That will draw more people into public health.

When I went to medical school, I had no clue what public health was. It is something I had to learn by on the job training. I think we are doing a much better job now as we do outreach to the community with pandemic flu, as we do outreach to all our partners with emergency response. The more value public health is given in society in general, the more it will be valued for people to come into the profession and to support it, as well.

Senator BURR. I would tend to agree with you. I think that our inability to define for the rest of America what public health is makes individuals reluctant to ever chime up and ask, what do you do, "I work in public health," because there can be a number of different analyses and determinations that one can derive from that.

I want to thank all of you for your willingness to come today and for the valuable information that you have shared with us. I could stay for another hour, as some of you know because I pick your brain all the time, but somebody has to preside over the Senate in about 3 minutes and that person fortunately enough is me today. So once again, I thank you.

This hearing is adjourned.

[Additional material follows.]

ADDITIONAL MATERIAL

RESPONSES TO QUESTIONS OF THE SENATE HELP COMMITTEE BY CDC

Question 1. Situational awareness is based on timely lab and hospital reporting, interconnected surveillance systems, consistent epidemic monitoring and reporting, and appropriate risk communication. Currently, there is wide variability across the country in these capabilities. How do we best make progress towards a national public health infrastructure with real-time situational awareness?

Answer 1. Situational awareness encompasses many different aspects, including timely reporting, communicating with all involved agencies, organizations, and individuals, and ensuring interoperable systems are available to enhance communications and reporting capabilities.

Traditional public health surveillance and investigations often involve the manual reporting of cases to public health agencies and phone calls to healthcare providers for more detailed chart information. The timeliness, completeness, and breadth of coverage of this manual process can be problematic and too slow to be effective during a public health emergency. With increasing volumes of health data in electronic form, and a national focus on the value of exchanging those data electronically in a standardized format, a unique opportunity exists to leverage those existing health data to better support public health functions.

BIOSENSE

BioSense is a national program intended to improve the Nation's capabilities for disease detection, monitoring, and real-time situational awareness through access to existing data from healthcare organizations across the country. The BioSense application is a CDC-developed and hosted web-based system for use by healthcare facilities and State and local public health partners. The surveillance methods in BioSense address the need for identification, tracking, and management of rapidly spreading naturally occurring events and potential bioterrorism events using advanced algorithms for data analysis. Through its BioInformation Center, CDC provides knowledgeable public health analysts, epidemiologists, and statisticians to assist partners in the analysis and use of BioSense data on a daily basis. In addition, CDC analysts provide support to State and local public health departments with training on the BioSense application. These staff members also monitor system performance, identify data quality issues, and collect feedback and provide input on the user interface design and operation of the BioSense application. This partnership with State and local health departments is important in the success of BioSense.

The Real-Time Data Initiative will strengthen BioSense by emphasizing access to real-time clinically rich data from emergency departments, outpatient clinics, and other hospital settings. These data will be useful for both early event detection and situational awareness. Situational awareness is the ability to monitor disease over time and geography. Using this data BioSense will inform public health in a way not previously accomplished. At the time of an emergency event, hospital and public health officials will have a real-time picture of how a community is affected. This information can help characterize and monitor an outbreak, as well as aid in the decision-making process for appropriate and timely public health interventions.

BioSense uses CDC's Public Health Information Network (PHIN) architecture for advancing fully capable and interoperable information systems across public health, its partners, and stakeholders. At the core of PHIN and BioSense are commonly accepted health data standards. This standard vocabulary will help to improve data quality, comparability, and other activities related to the development of an electronic health record. A key component of this development is the interoperability between public health and healthcare.

Risk communication is an essential element of this process. When surveillance systems or other reporting mechanisms signal an unusual event (natural occurring disease outbreak or bioterrorism related), it is vital to disseminate effective risk communication messages in a timely manner. CDC utilizes several different communication mechanisms in order to release health alerts and updates to those who need them.

- Through *Epi-X*, State and local health departments, poison control centers, and other public health professionals can access and share preliminary health surveillance information—quickly and securely. Users can also receive active notification of breaking health events as they occur.
- The Health Alert Network (HAN) is a nationwide communications network that uses high-speed Internet connectivity to rapidly broadcast information and link State and local health departments to one another and to other organizations that

are critical for preparedness and response, such as community first-responders, hospital and private laboratories, State health departments, and Federal agencies.

GLOBAL DISEASE DETECTION

CDC's Global Disease Detection (GDD) program will protect U.S. citizens and citizens of the world from emerging diseases or terrorist threats. Where countries are not prepared for a major outbreak, efficient and effective interventions must be deployed to slow down, or contain, an emerging health threat. A key defense is to establish surveillance, epidemiological, and laboratory systems in strategic overseas locations to quickly detect outbreaks and minimize spread at the source.

CDC's major contribution to the international response capacity currently led by the World Health Organization (WHO) is to fund and provide key staff for GDD Response Centers, which are strategically placed in each of the six WHO regions. CDC plans to deploy staff to these centers in five of the six regions by the end of fiscal year 2006. Central to each GDD Response Center will be interventions to respond to regional outbreaks as they arise through proven, effective programs and approaches that align with partner countries' identified priorities:

A. Field-based epidemiology and laboratory science
B. Rapid response to international emerging infections
C. Supplemental interventions determined by partner countries

The GDD Response Centers will provide support to national laboratories and epidemiology programs in their respective WHO regions. During emergency outbreaks, the Centers will contribute as members of the Global Outbreak and Response Network (GOARN) under WHO's leadership. In non-emergency settings, the GDD Response Centers will work with country partners to facilitate disease detection and response interventions. Surveillance data will also feed into the GDD Outbreak Information Center at CDC's Atlanta headquarters for analysis and response as appropriate.

The GDD will help to elevate surveillance and monitoring and enable situational awareness on an international level, leveraging resources in advanced countries to help in those who have less-advanced capabilities.

Question 1. How do we recruit, train, and retain a prepared public health workforce with the ability to respond to national threats—whether acts of terrorism or by Mother Nature?

Answer 1. CDC emphasizes "all-hazards" preparedness. Workforce development activities for public health preparedness are quite comprehensive and encompass many issues, including: mental health preparedness and resiliency, the National Incident Management System, disease investigation and reporting, weapons of mass destruction, and risk communication. Utilizing this comprehensive approach ensures that public health professionals trained in preparedness activities have a set core of skills that can be utilized for effective response to any event, natural or terrorism-related. The public health response to SARS in 2003 is an actual example of how public health utilized preparedness and emergency response components/elements during a naturally occurring event.

Public health professionals play an essential role in addressing the emerging threats and health challenges of the 21st century. CDC is actively engaged in strengthening State and local public health workforce through training and activities that will provide workers with the necessary skills, competencies and resources to accomplish their mission. Recruitment, training, and retention are key elements of CDC's role in workforce development. Examples of specific workforce activities conducted by CDC are listed on the attached *Sample of CDC Workforce Development Activities* two-page document.

Recruitment: CDC efforts regarding recruitment focus on three key areas: identifying preparedness oriented competencies for successive planning purposes, establishing fellowships, internships, and scholarships with graduate programs in public health to increase the number entering the public health workforce pipeline and focusing on preparedness careers, and increasing the image and awareness of public health as a career choice. Bringing well-qualified people into the public health profession will have a positive impact on preparedness and response activities at all levels.

Training: Due to the need for skilled and competent workforce, CDC has placed special emphasis on training. Specific strategies to enhance training include: linking academic expertise to State and local agency needs, collaborating with health and public health agencies across the Nation to help them meet preparedness education and learning needs, maximizing outreach of existing preparedness materials, enhancing the evidence-base for effective preparedness education, and aligning train-

ing with clearly defined competencies, and the identification of clear, consistent training requirements. Enhancement of training programs will help to provide the public health workforce with necessary skills and competencies needed for effective job performance.

Retention: Retention is a critical element, to ensure that those who have been recruited and trained remain in the public health workforce. CDC is helping facilitate retention activities by providing continuing education opportunities for public health workers engaged in preparedness and response activities, increasing interstate collaboration to accomplish equal or greater response capacity without overburdening understaffed agencies, and encouraging employee and organizational recognition. All of these activities will help to retain public health professionals in key positions vital to preparedness and response.

Question 2. How do we develop public health systems research, paramount for developing evidence-based best practices and benchmarks, for an all-hazards public health response?

• For example, do issues ranging from disease forecasting to financial modeling of Federal and State public health investments need further study?
• How is "public health preparedness" best defined and what are the metrics for measuring success?

Answer 2. Preparedness is a relatively new public health discipline, compared to diseases that are centuries old. Multi-disciplinary research methods that are entirely consistent with how public health has functioned in traditional areas of disease and injury control and health promotion are needed. The traditional public health model has focused on 4 areas: defining the problem (surveillance); establishing/identifying risk/protective factors (investigation); designing prevention and control strategies (environmental, medical, and behavioral interventions), and; disseminating and evaluating those strategies to maximize impact. This model is sound, but the investment takes long-term vision and commitment for success.

CDC is committed to furthering science and best practice regarding all-hazards preparedness. Nine preparedness goals frame and guide the science and program priorities. These goals align in six categories: prevention, detection and reporting, investigation, control, recovery, and improvement. Specific commitments for CDC science include:

• "Studying" response activities with quality improvement orientation through after-action reviews and corrective action plans. (Ex. Katrina AAR and CAP action registry)
• Strengthening response to small and large events by focusing on the detection, enumeration, and characterization of disease scenarios with an applied orientation to action-steps to reduce impact and prevent further incidents. CDC has strength in varied experiences applying multi-disciplinary science teams to characterizing and responding to health events (epidemiology, laboratory sciences, behavioral and social sciences, math and statistics).
• Balancing the need to fill gaps in operations that may impede an effective response with the need to make. investments in research and development to leveraging science and focus programmatic efforts for maximal effect. A new initiative for the expansion of the public health science base for preparedness and response is needed.

Forecasting and modeling tools are important areas for investment and development. A large opportunity to leverage existing knowledge better and faster using these types of tools, but preparedness planning should not rely solely on these tools.

CDC will continue to define the public health research agenda and prioritize research activities to expand our knowledge base and guide all preparedness activities.

SUMMARY

Situational Awareness: Situational awareness encompasses many different aspects, including timely reporting, communicating with all involved agencies, organizations, and individuals, and ensuring interoperable systems are available to enhance communications and reporting capabilities.

BioSense is a national program intended to improve the Nation's capabilities for disease detection, monitoring, and real-time situational awareness through access to existing data from healthcare organizations across the country. The BioSense application is a CDC-developed and hosted web-based system for use by healthcare facilities and State and local public health partners. The surveillance methods in BioSense address the need for identification, tracking, and management of rapidly

spreading naturally occurring events and potential bioterrorism events using advanced algorithms for data analysis.

CDC's Global Disease Detection (GDD) program will protect U.S. citizens and citizens of the world from emerging diseases or terrorist threats. Where countries are not prepared for a major outbreak, efficient and effective interventions must be deployed to slow down, or contain, an emerging health threat. A key defense is to establish surveillance, epidemiological, and laboratory systems in strategic overseas locations to quickly detect outbreaks and minimize spread at the source.

Workforce Development: CDC emphasizes "all-hazards" preparedness. Workforce development activities for public health preparedness are quite comprehensive and encompass many issues, including: mental health preparedness and resiliency, the National Incident Management System, disease investigation and reporting, weapons of mass destruction, and risk communication. Utilizing this comprehensive approach ensures that public health professionals trained in preparedness activities have a set core of skills that can be utilized for effective response to any event, natural or terrorism-related. The public health response to SARS in 2003 is an actual example of how public health utilized preparedness and emergency response components/elements during a naturally occurring event.

Public Health Systems Research: Preparedness is a relatively new public health discipline, compared to diseases that are centuries old. Multi-disciplinary research methods that are entirely consistent with how public health has functioned in traditional areas of disease and injury control and health promotion are needed. The traditional public health model has focused on 4 areas: defining the problem (surveillance); establishing/identifying risk/protective factors (investigation); designing prevention and control strategies (environmental, medical, and behavioral interventions), and; disseminating and evaluating those strategies to maximize impact. This model is sound, but the investment takes long-term vision and commitment for success.

CDC is committed to furthering science and best practice regarding all-hazards preparedness.

SAMPLE OF CDC WORKFORCE DEVELOPMENT ACTIVITIES

RECRUITMENT

- The Centers for Public Health Preparedness (CPHP) program is a network of 52 universities and college programs contributing to readiness through preparedness education and training. The program has convened collaboration groups focused on defining preparedness-specific knowledge, skills, and abilities for:
  - those public health professional disciplines who are and will be experiencing the greatest shortages—nurses, sanitarians, laboratorians, and epidemiologist; and
  - crisis leadership.
- For 2004–2005, the CPHP program funded 6 internships and 6 scholarships. The programs recruit and place students in State and local health departments to assist with outbreak investigations and other short-term applied public health projects. Getting experience in a public health practice setting while in graduate school may provide students with interest in and knowledge about pursuing a career in the public sector. Providing students with the opportunity to participate in an epidemiologic response or investigation highlights the role of epidemiology within the context of applied public health.
- CDCs Epidemic Intelligence Service (EIS) is a unique training, 2-year postgraduate program of service and on-the-job training for health professionals interested in the practice of epidemiology. Since 1951, over 2,000 EIS Officers have responded to requests for epidemiologic assistance within the United States and throughout the world. Every year, CDC's EIS Program selects 60–80 persons from among the Nation's top health professionals to enter the EIS and pursue on-the-job training in applied epidemiologic skills—skills vital to maintenance of public health.
- CDC's EXCITE (Excellence in Curriculum Integration through Teaching Epidemiology) (*http://www.cdc.gov/excite/*) systematically integrates current public health crises and issues into K–12 education. All content aligns with math and science curriculum standards.

TRAINING

- The CPHP programs support preparedness education needs in all 50 States, the District of Columbia, Puerto Rico, U.S. Virgin Islands, and multiple Tribal Partners. For 2004–2005, the CPHP program provided 395 preparedness education activities

to State, local, and academic audiences. The estimated reach for all activities and audiences combined was over 209,000 learners. For 2005–2006, CPHPs are approved to complete 639 activities, of which 429 will provide preparedness education and training to an estimated 98,578 learners.

- The 2004–2005 and 2005–2006 CPHP cooperative agreement guidance requires that universities and colleges work in close collaboration with State and local health agencies to develop, deliver, and evaluate preparedness education based on community need.
- The CPHP web-based Resource Center (*http://www.asph.org/acphp/phprc.cfm*) houses 723 educational resources. These resources include all sharable components of CPHP program activities such as courses, curricula, training exercises or drills, or other materials developed and/or delivered with Federal funds.
- The CPHPs have developed a set of toolkits to assist State and local partners locate competency-based preparedness training and education products. These tool kits include:
  - *Public Health Worker Preparedness Certification.*—Developed an inventory of preparedness training programs that certify the acquisition and/or demonstration of emergency readiness and response competencies for public health workers.
  - *Preparedness and Crisis Leadership Education.*—Defined Crisis Leadership competencies and curricula; and outlined existing CPHP courses related to crisis leadership workforce development.
  - *Occupational Safety/Worker Preparedness.*—Identified core competencies for worker training related to preparedness and training materials or programs available to the CPHPs related to competencies.
- The FY 2006 Cooperative Agreement for Public Health Emergency Preparedness guidance requires that State and local health departments develop, deliver, and evaluate competency-based preparedness education in conjunction with Centers for Public Health Preparedness (CPHP), and academic experts in other schools of public health, medicine, nursing, and academic health science centers.
- The FY 2006 and FY 2007 Cooperative Agreement for Public Health Emergency Preparedness guidance for State and Local Health Departments is consistent with FEMA's NIMS Integration Center training guidelines, thus providing State grantees with a clear, consistent set of training requirements for NIMS compliance.
- CDC utilizes distance learning technologies to mass distribute live education events as well as archive re-usable educational products. Examples include:
  - *Public Health Grand Rounds, Learning from Katrina: Tough Lessons in Preparedness and Emergency Response* webcast and satellite broadcast.
  - *CDC's Pandemic Influenza* course, will be videotaped and made available to a wide State and local audience.
- Project Public Health Ready is a collaborative activity between CDC and the National Association of County and City Health Officials (NACCHO). The mission of the project is to prepare staff of local governmental public health agencies to respond to "all hazard" emergencies and to protect the public's health through a competency-based training and recognition program. The project requires that each site meet certain emergency preparedness criteria, which have been divided into three main overall goals: Emergency Preparedness and Response Planning, Workforce Competency Development and Exercises/Simulations. There are 18 sites around the country that are recognized as Public Health Ready.

RETENTION

- Continuing Education: This year COTPER funded 20 preparedness training and education projects. 15 of 20 projects will be available to State and local audiences. Specific target audiences include: public health leaders and emergency responders at the State, local, and territory levels; clinicians; veterinarians; environmental health workers; scientists; and laboratory workers.
- For 2004–2005, the CPHP program provided 177 preparedness education activities that specifically targeted the learning needs of State and local public health workers.
- CDC's Hurricane Katrina/Rita Corrective Action Plan will address public health mutual aid needs and enact processes for emergency response (including EMAC) through a workgroup consisting of representatives from CDC, other HHS OpDivs, ASTHO, CSTE, NACCHO, APHL, NEHA, and NEMA.
- The CPHPs provide technical assistance, training, and exercise support to local governmental public health agencies seeking Project Public Health Ready recognition.

[Whereupon, at 11:57 a.m., the subcommittee was adjourned.]

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