2nd National Symposium on Medical and Public Health Response to Bioterrorism

Transcripts

Welcome and Symposium Information, D.A. Henderson, MD, MPH
Biological Weapons as a Strategic Threat, Paul Bracken, PhD
Advances in Biotechnology: Promise and Peril, George Poste, PhD
CDC's Strategic Plan for Bioterrorism, Jeffrey Koplan, MD, MPH
US Domestic Preparedness and the Complex Threat of Bioterrorism, Richard Falkenrath, PhD
Reducing the Bioweapons Threat: International Collaboration Efforts, Col. Edward Eitzen, MD, MPH
Olympics 2000: Preparing to Respond to Bioterrorism, Jerome Hauer, MPH
International Cooperation to Prevent Biological Weapons Research and Development, Amy Smithson, PhD
Global Awareness of Disease Outbreaks: The Experience of Pro-MED, Martin Hugh-Jones, DVM, PhD
Outbreak Surveillance and Management at the State and Local Level: Current Realities, Marcelle Layton, MD, MPH
Treating the Sick: Capacity of the U.S. Healthcare System to Respond to an Epidemic, Ken Bloem
Challenges for Hospitals, James Bentley, PhD
Mobilizing Professional Communities, John G. Bartlett, MD
Institutional Networks: Regional Responses to Disasters, Jeffrey Rubin
National Disaster Medical System, Robert Knouss, MD
Department of Defense: Supporting the Health Care System, Major General Bruce Lawlor
International Leadership in the Control of Biological Weapons, Ambassador Richard Butler
Challenges Confronting Public Health Agencies, Margaret Hamburg, MD
Lessons from TOPOFF, Thomas Inglesby, MD
Understanding Public Response to Disasters, Thomas Glass, PhD
How to Vaccinate 30,000 People in 3 Days: Realities of Outbreak Management, Michael Osterholm, PhD, MPH
Legal Issues Surrounding Public Health Emergencies, David Fidler, JD
Understanding Media's Response in Epidemics, Laurie Garrett
Panel Discussion: Epidemic Response Scenario: Decision Making in a Time of Plague
D.A. Henderson, MD, MPH

Welcome and Symposium Information

Good morning. I am D.A. Henderson. I’m Director of the Johns Hopkins Center for Civilian Biodefense Studies, and on behalf of the center and the other principal sponsors of this symposium, the Department of Health and Human Services, and the Infectious Diseases Society of America, it is a special pleasure to welcome you to this second symposium on the medical and public health response to bioterrorism.

I would call to your attention that the meeting is also co-sponsored by 18 other organizations, professional organizations which are identified in your program, and we express thanks as well to the 34 members of a program committee who likewise are identified in your program.

As many of you will recall, the first symposium 18 months ago was fully subscribed, and based on the continuing flood of visits to our website since that time, it is apparent that it was reasonably successful in meeting the need for communication, especially to the medical and public health communities of the realities of biological weapons and used as instruments of terror in the civilian setting.

A number of special symposia and meetings have occurred over the past 18 months. CDC and USAMRIID have presented a three-day telecast that reached at least 15,000 persons, and the subject of bioterrorism has now begun to appear as a regular subject in the program of many national and regional medical meetings.

As time passed, the salient question was posed as to whether there was a need for a follow-on to the first symposium, and if so, what its content might be. With Drs. Tara O'Toole and Tom Inglesby from the center serve as point persons for a program committee, the conclusion was reached that a national symposium on civilian bioterrorism oriented primarily to the public health and medical audience was useful and should be continued.

However, a somewhat different emphasis from the first symposium was considered desirable in order to focus on major issues that so far were proving to be especially troublesome or were being inadequately addressed, and I shall return to those in just a moment.
What attendance could be expected was speculative, but there was unanimity that because of the number of other symposia, there would certainly be no more and perhaps less demand for the second symposia than for the first.

On behalf of the committee, I extend apologies for misreading the level of interest and for having had the closed registration for this symposium two weeks early and to turn so many away. I would note, however, that the symposium will be Netcast on our website with talks becoming available by mid-December, and the proceedings will be published in Public Health Reports.

Now, last night at a special reception hosted by Dr. Steven Knapp, who’s Provost and Vice President of the Johns Hopkins University, we were pleased to announce a very generous three-year grant to the center of three and a half million dollars provided by the Alfred P. Sloan Foundation. We are, indeed, grateful. It will cover nearly half of our projected budget over the next three years, and we expect to see further development in the next three years of our activities.

Now, the meeting has several themes or, perhaps better, areas of special emphasis, and for each of these topical areas, the committee identified those individuals whom they considered might best address the issues, and virtually every invitation that was extended was accepted. An exception were key congressional leaders who at this time seem unexpectedly preoccupied with --

(Laughter.)

-- other issues, such as the possible effect of dimpled chads and hanging chads and so forth. So the first subject, at any rate, will occupy us through the noon lunch today, is an examination of the current status and nature of the challenge of bioweapons to national and international security, and the nature of the national strategy to deal with the problem.

This afternoon the focus is on surveillance, both at the national and international level, and this will be followed by a discussion of the capacity of our health care system to respond to an epidemic.

For the dinner this evening, we are privileged to have with us Ambassador Richard Butler of Australia, now diplomat in residence at the Council on Foreign Relations, formerly Australian ambassador and permanent representative to the United Nations and later Executive Chairman of the UNSCOM Mission in Iraq. He is, as you know, author of the recently published book The Greatest Threat.

Tomorrow takes up the difficult challenges in dealing with a major epidemic, particularly in the public health, legal, and media areas. The afternoon session will deal with strategic priorities for the longer term future as we as a nation struggle to come to grips with practical approaches in prevention.
Now, I am pleased to inform you that concluding speakers on the program not presently listed are two. One is Dr. John Hamry, President of the Center for Strategic and International Studies, until very recently Deputy Secretary of the Department of Defense.

The second speaker will be Senator Ted Kennedy. These will be the concluding papers on Wednesday afternoon.

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Paul Bracken, PhD

Biological Weapons as a Strategic Threat

DR. HENDERSON: It is my pleasure to introduce Dr. Paul Bracken, who is professor of management and political science at Yale University, specializing in national security and management issues. He's written extensively on these subjects. An article, "The Second Nuclear Age," appears in the January issue of Foreign Affairs. His current book is Fire in the East: The Rise of Asian Military Power and the Second Nuclear Age. He's a member of the Council on Foreign Relations and serves on the CNO executive panel. He holds a bachelor's degree in engineering from Columbia and a doctorate in operations research from Yale.

His paper is entitled "Biological Weapons as a Strategic Threat." Dr. Bracken.

(Applause.)

DR. BRACKEN: Thank you very much. I'm very honored to be here with so many experts, and I recall W.C. Fields' definition of an expert. If you remember that, it was somebody from out of town.

(Laughter.)

So I'm from out of town, although I get here fairly often.

What I'd like to talk about is the overall how to think about biological weapons, how I think about biological weapons in an overall context, and I've often found if you're thinking certain thoughts, it's often the case that somebody else is thinking about them also. So my subject is the implications of the proliferation of biological weapons and the effect is it might have on the changing the world balance of power, a rather lofty subject, but let me just briefly talk for a minute or two about the Cold War to make the point that I don't think biological weapons had much of an effect on the Cold War, even though there was a lot of them on the Soviet part and early on in the case of the United States.
My first introduction to biological warfare, and I am not like in the biological warfare studies community; I am not an expert in that. I'm not sure there are any experts. There's specialists, but there's probably no experts. My first introduction to this subject was when I got a job out of college. I had to go up to a place -- I don't even know if it exists anymore -- Edgewood Arsenal, and I had to read something called the "Mandrake Route War Game," and they locked me in a vault, and I read this study. It was a biological attack on Western Europe. It was absolutely nauseating and repulsive. You have the sort of beginner's mind when anybody is exposed to biological warfare. It just is overwhelming in its depressing aspects of it.

Then in 1973, I was doing a study for the Army, and we went up to Aberdeen, and we actually had some of the chemical warfare suits that we captured in the '73 war. These are chem. suits, not bio. protection, and we did some experimentation with those and found out that if you wore them for more, I think, than two hours, you would collapse from heat prostration. These were not very effect, and they leaked like hell, too, not a good feature of protective suits.

So the point of these anecdotes is to suggest that biological and even chemical warfare, although huge stockpiles were built during the Cold War, they really did not have much effect on the world balance of power. Rather, I would summarize it by saying although there were large stockpiles, these forces were not in any way, shape or form integrated into the armed forces of either side.

Now, I know the Soviets built a lot of this anthrax and things, but the average Soviet division was really untrained in them, did not have good protective cover. They just were not -- they were kind of an existential deterrent, and that's how I think they were looked. They were put in the background. And this reinforced a strong belief in the policy community in the United States that chem. and bio. weapons had a certain opprobrium attached to them, that they had such a stigma that decision makers would not ever want to use them, and actually that I think is true. And I say that now because I think it's a lot less true. I think biological and chemical weapons will be major features of proliferation because the payoff from them in what I'm going to call the second nuclear age is a lot greater than in the first nuclear age, where I argued that it was pretty low.

I actually lost interest in a lot of national security issues in the '80s and '90s and turned to other things, but a couple of years ago I got interested in it once again when the Indians tested their nuclear shot in 1998, and I was asked to do a study for the commander in South Korea, the Kamon forces command on the North Korean biological warfare program. That got me over there and into some stuff. It was really quite interesting. I had the same, I think, experience that the people who studied the Iraqi program had, which is it was just so vast, so enormous for an economy that miniature size, and somebody has still yet to tell me how a country like Iraq or North Korea, countries which have GNPs of probably about $20 billion, which is about one-sixth of the revenues of the General Electric Corporation, can mount these awesome military programs.
I mean, we don't understand the economics of defense spending in these countries because if you look at the nuclear programs in both countries, there's tens of thousands of people. I don't see how they can do it. I mean even pressing their own populations.

But, anyway, how do I think about these things now, biological weapons and weapons of mass destruction? I argue that the world really is dramatically changing in the following way: that with all of this focus on globalization and international business and the Internet bringing countries together, I think there's really another part of it. I believe that's all true, and it's very good, very useful, but we're seeing a spread of weapons of mass destruction and what I would call the second nuclear age.

Now, the way I think to get this notion of the second nuclear age across is to recognize that we're not talking about a handful of rogue states, countries here or there which are resisting the trends towards globalization and acceptance of international arms control norms. We're talking about really a fair number of states. Picture in your minds for a moment a map of Asia extending from Israel to North Korea, and in that map there is a connected belt of countries every single one of which is mounting major programs of weapons of mass destruction and/or ballistic missiles to deliver them, every single one of them.

There's a field in political science that says if you're from a poli. sci. background you'll know that comparator politics is, you know, one of the major fields like international relations or American studies. And if you ask, you know, what does North Korea have in common with Pakistan, what do they have in common with Israel or Syria, the answer you'd think is not very much, but let me tell you one thing they do have in common. Every single one of those countries is building weapons of mass destruction and missiles.

You have Israel, which, you know, who knows what their program is, but very strong evidence that they have bio. and chem. programs. Syria, it's well know. Iraq we have the best information on because she lost the war and we sent inspectors in, and we really don't know much about Pakistan, India and China. I personally would be amazed if they did not have major programs. There is not, I think, a lot of hard intelligence to support that conclusion, but you know, after all, we have to be realistic about what intelligence can give us, and the answer is that we can't ask in the intelligence community to make estimates about things which really you can't expect to know very much about.

So my argument is that the world is entering a second nuclear age. Now, the argument is that a lot of countries, the ones I've mentioned, are building weapons of mass destruction and the missiles to deliver them. I would make a couple of points about this. What's distinctive about the second nuclear age is how little it has to do with the first nuclear age. It has nothing to do with the NATO-Warsaw Pact battle in Europe and NATO, which is what got the United States and the Soviet Union into this arms race with these kinds of weapons.
I think it's in a strange way, but accurate, to think about this as a restoration of the dynamic aspects of Asian civilization. You can write a pretty good history of the past 1,000 years by saying the West got technology first and commercial technology and military technologies and use this as a source of domination for the entire world. Well, those technologies are now spreading. They can no longer be retained by a Western monopoly of countries, including the Soviet Union and now Russia as a Western country, but they're spreading, and I think they're spreading fairly rapidly.

As to the motivations for this, one could put on an arms control framework for why all of this stuff is going on, and you discuss the norms and try to build up global norms why building biological weapons is a bad thing to do, but I would ask you for a moment just to suspend those frameworks and see what it looks like if you're a country, such as Iraq or Iran.

You're faced with the world's only super power, the United States, and if they are to challenge the United States head on using laser guided bombs, stealthy aircraft, it presents impossible problems for them to solve technologically and economically. They couldn't possibly do it.

So I think the way to understand why countries are building these weapons is just to look at local business practice, to understand that if a company were to challenge IBM or AT&T, they wouldn't do it with the same skill sets that the dominant players have. And many of these technologies have an unusually large, disruptive effect on American advantages. So to take one example, if you put a biological weapon on a ballistic missile, which is a very simple thing to do, I mean, we can get into an argument, you know, about whether it's easy or not to do, but to put it on there -- I didn't say to make it work, but to put it on there -- is an easy thing to do.

It really, I think, changes dramatically the balance of power in the world for the following reason. U.S. and, in fact, following a long tradition of Western outside powers in Asia have built their military prowess on a small number of bases, military bases, bases in Okinawa, Guam, Diego Garcia, South Korea, Yokosuka in Japan. To render those bases vulnerable, to render those bases at risk only takes a handful of missiles.

Just consider what's happening now. The United States is about to go into at least a theater ballistic missile defense program which is designed to protect bases in Asia. Now, my calculations roughly show that for every dollar in offense you spend, you can force the opponent to spend $12. This means that puny countries like North Korea, serious countries like China are forcing the United States into this expenditure of about 12 to one to defend a Marine base in Okinawa, and I think this is unsustainable politically and economically in the United States, and I would anticipate the U.S. will put a lot less emphasis on military bases in the future, but I would offer that as an example of changing balance of power in the world.
The United States is not going to have the base presence in Asia that it has had for the past 50 years. Indeed, there’s even questions about the survivability of more mobile forces, but that would require technologies that are a little further off into the future.

A couple of other points which got me interested in this subject and which I think really are sort of new, yet the same, and I often think that people ask me how are things different in this second nuclear age than the first. Well, in one way that they are the same is that in both cases you have huge what we call command and control problems, which is how do you keep your control over there forces so that they’re not fired when they shouldn't be; they are fired when you want them to be, and they are not so vulnerable that they draw fire from the other side, causing that kind of accidental or inadvertent war.

That’s a real consideration if you look at the Pakistani forces and the Indian forces, which in some of those cases, their weapons of mass destruction are stockpiled in a very small number of bunkers, almost suggesting that they draw fire.

But these are problems of the first nuclear age, the U.S.-Soviet competition, and I think they are also problems of the second nuclear age, but they’re a lot worse because the United States and the Soviet Union were willing and did spend hundreds of billions of dollars to lock up their weapons, protect them, guard them, run very realistic simulations and war games, and in my view the arsenals were safe, but only because they spent tens or hundreds of billions of dollars to make them safe, and it’s unimaginable to me that that would happen with North Korea or Pakistan or even, frankly, Israel, that they would spend anything like a proportion of their defense budgets on securing these systems.

I think something we often forget when we look at proliferation as a kind of abstract phenomenon is a lesson from the first nuclear age that leaders matter. The individual personality of the head of state when he's in a crisis or when they are making decisions about what weapons to acquire has a profound impact. These are not autonomous technologies.

The French never would have built nuclear weapons had they not had De Gaulle President in the late 1950s. I don't think North Korea or Iraq would have had the program they had if they did not have Kim Il Sung or Saddam Hussein, respectively, as leaders. And so we really have to factor in the personality of leaders in considering these matters.

Now, I think there's a couple of differences between the era we are now entering and the Cold War competition from previous years. One is the role of nationalism. If you look at the United States and the Soviet Union, in waging the Cold War public opinion had relatively little to do with the behavior of the states in a crisis.

There was a lot of play to public opinion about bomber gaps and missile gaps with respect to weapons acquisition programs, but in things like the Cuban missile crisis, the ’73 Middle East war, leaders could look at the national interest almost divorced because
the public wanted them to dampen the crisis, and I think that's much less likely to be
true in the proliferating countries that I've been discussing up here.

Indeed, one of the premier feature of the Cold War was this kind of icy rationality that
was used to wage it. We had think tanks like the Rand Corporation and the Hudson
Institute using models loosely based on game theory, the kind of paradigm of icy
rationality where you calculate your move six and seven steps ahead and find
equilibrium points. I just think that's very unlikely to govern the behavior of a North
Korea, a Syria and, again, frankly, an Israel which is imbedded in this network of states
like them.

So when I look at, you know, what does it all mean, how to think about biological
weapons, I would say unlike the first Cold War, the first nuclear age, they really are
having a major effect on changing the world balance of power because the social norms
attached to using them are really quite different. Iraq had integrated chem. and bio. into
her military forces.

I mean, the Iraq program is truly frightening. They had anthrax in Scud warheads ready
to go. They had predelegated launch authority to some of their commanders, that if the
United States went into Baghdad you have the automatic authority to launch, and at the
end game of the war, it was quite interesting if you read Victor Haselkorn's book of how
they were sending a signal that if the war continued, they might bombard Israel with
biological weapons.

So I think the norms, unlike in the first nuclear area, are radically different and leaning
you toward greater use, greater acceptance because of this kind of anti-Western
nationalism that you find in much of Asia, and it goes something like this: that you guys
have all the big technology and the aircraft carriers and the Stealth bombers. So it's fair
for us to use these cheaper, poor man's nuclear weapons like biological weapons.

And finally, I'll say that I'm not predicting a nightmare future. The future I learned a
long time ago hasn't happened yet. It's up to us to shape that future. But I would be very
suspect of arguments that say globalization and international norms of a Western
variety are spreading so fast that they will drive our proliferation. It seems to me a
better, more empirical description of what's happened in the last few years at least is
that the economists have this term "a wealth effect." As countries get a larger GNP, some
of it spills over into the military.

So not surprisingly, when India gets richer, she builds more nuclear weapons and
probably more biological weapons. That's harder to apply to North Korea and Iraq, but
as I said earlier, I'm not sure how to think about the economies of those countries. So I
see just a gradual build-up in proliferation, and whether or not there's a war depends on
a whole set of factors, but war is not the thing to look at. The thing to look at is the
spread of the weapons.
Dr. Henderson: Our next speaker is Dr. George Poste, who's Chief Executive Officer of Health Technology Networks, a health care consulting group now based in Arizona, and he serves as well on the board of directors of a number of biotechnology firms. For the past 20 years Dr. Poste has been with SmithKline Beecham where most recently he served as President of Research and Development and Chief Science and Technology Officer. He holds a doctoral degree in veterinary medicine and a PhD degree in experimental pathology from the University of Bristol in England. He's a Fellow of the Royal Society, the Royal College of Veterinary Surgeons and the Royal College of Pathologists. He has served on numerous advisory boards to governments both in this country and the United Kingdom, and most recently, he chaired the Defense Science Board's study entitled "Technologies for Biodefense." His paper is entitled "Advances in Biotechnology: Promise and Peril." Dr. Poste.

(Applause.)

Dr. Poste: Good morning. I'd like to thank the organizers for the invitation to participate in clearly a stellar assembly of speakers. The topic which I'm going to address, assuming that -- yes, there it is -- is this issue of biotechnology in context both as a classical dual use technology -- we've gone backwards. So let's -- if we can go forward. There we are.

I think if one looks at the technological foundations of military doctrine historically and, indeed, still dominant today is this issue of what I've paraphrased as "big bang, big metal," but in short, the technological underpinnings are primarily based upon the conceptual advances in physics and engineering, and the type of weaponry that is produced has the advantage for the intelligence community of creating high profile signatures.

But as we've just heard from Dr. Bracken, the framework of the political constituencies that may not necessarily look with less friendly attitude toward the United States and its allies, there is a change towards the prospect of asymmetric warfare utilizing two technologies: the first, undermining the increasing dependence of all of us upon information technology through assaults in the cyber warfare arena, and our topic today in terms of bio. because biotechnology undoubtedly changes the rules, as we will hear throughout this meeting, and I think it's probably fair to paraphrase it as the fact that biology for the first time is losing its innocence.
If you speak to many in the biomedical community where quite appropriately their principal modus operandi is the advancement of human health and quality of life, they're quite shocked to think that some of the things that they're working on could, in fact, have malignant application. A simple example would be the much publicized dimension of gene therapy, a well intentioned effort to restore bodily function by inserting genes into the human body, and as we've seen in well publicized tragic consequences of a recent death at the University of Pennsylvania, the issue of using infectious agents to introduce genes into the body, the issue is not whether or not that was an intellectually sound exercise. It clearly is, but with the recognition, surprise, surprise, it should hardly be a surprise that the body actually recognized the vector that was being used to deliver this gene into the body. So what is now the principal aim in gene therapy for beneficent application is to create stealth viral vectors, namely, viral vectors which will escape detection by the immune system of the host. And if you point this out to many of the denizens of the gene therapy community that they might actually be very much help in the military doctrine of Baghdad and others, they're quite shocked that such a prospect could even be considered.

So the issue of biology losing its innocence is something we have to seriously consider, and I think it will become an increasingly problematic issue for the academic research community where in physics, high energy physics, people have got you not to forbid them knowledge, but constraint knowledge. Biology has yet to make that transition. But what we're dealing with here clearly is an issue of increasingly complex dual use technologies. If we look at the beneficent phase of biotechnology, and this is the only slide on the beneficent domain, there are really four principal areas of application. The top box there on the left mapping the molecular basis of disease i the primary emphasis here, namely, the ability to elucidate biological mechanisms in health and diseases, providing a very rich vein of the pharmaceutical and biotech. industries to tap to identify new molecular targets for drugs, vaccines and diagnostics.

Moving down still on the left-hand side it's also revealing that diseases are far more complex than we thought in terms of their underlying molecular pathology, and therefore, diseases that may have similar clinical symptomatology, in fact, turn out to have distinct molecular pathologies, either the genetic or the proteomic level, leading to the issue that we have to think about the right drug for the right disease, and switching to the right-hand column is how does your unique genetic profile and my genetic profile influence in the top box how we respond to drugs and vaccines, particularly in terms of their efficacy and safety, and then longer term, the issue of how does my genetic composition and ours predispose us to major diseases. And all of these hold the promise of enormous gains in health care in the coming decades and, indeed, elements of that have already become reality.

The other side of it, of course, though also focuses on microbiology, and that is the question of the analysis of microbial genomes certainly has many important applications in the beneficent arena, but the other element of it is this, namely, that by mapping the molecular basis of microbial disease, we also identify new ways of using that information to, in fact, attack human populations and moving into the other side of the
slide, so-called exploring biospace. It's very clear that the evolution, even though it's quite magnificent in its products, has only explored a very small fraction of the potential building blocks that sort of essentially nature is a molecular lego whether you're working at the gene or the protein level. The ability to create total novel genes and novel proteins and, therefore, novel organisms opens up a quite fascinating domain both in the beneficent, but equally the malignant level. And as systems biology gains momentum over the next two decades, namely, the ability to build up from gene to protein, to understand the complex genetic circuitry that pertains to engineering the specificity of different cell types in the body or the profiles of different microorganisms, computer programs become increasingly accurate in predicting the behavior of biological systems.

And so that issue of biology en silico will also become an important tool, but if we focus now on the overtly malignant aspect of this, it is the identification of new molecular targets for bioagents, and with their understandable anthropocentric focus, we tend to forget that there is a devastating range even if only at the economic level, a devastating range of targets in terms of animal and plant populations, and irrespective of whether the target is man, animals, or plants, there are number of increasingly powerful and interesting technologies which can be applied here.

The first is to expand the tissue or host range, the recent paper that was published, for example, in Nature Biotechnology showing that through recombination you could completely change the host range and tissue range of retroviruses simply by doing molecular shuffling techniques. New modes of spread, the ability to take an agent which from the standpoint of the bioweaponeer has an inconvenient mode of spread and convert that to an aerosol spread, becomes obviously an area of appeal, well established elements from both the U.S., but certainly the Soviet strategy circumventing the ability to create organisms that either lack an antigen to escape the diagnostic test, the acronym Dx, or the ability to circumvent therapy with antibiotics, Rx, or to have altered antigens that permit you to escape from immune protection from the vaccines which are available.

Hypermutable agents. You could almost argue that HIV in its own right is a hypermutable agent, but it's very clear from looking at antibiotic resistance issues in bacteria that there is a subset of bacterial populations which actually have hypermutable status that relates to alterations in their nucleic acid repair enzymes, and these, therefore become obvious targets to create agents that are hypermutable both in terms of driving patterns of pleiotropic antibiotic resistance, but also the ability to escape from immune assault by the body. And the dimension which I'll come back to is actually using the body's own defense mechanisms against itself in this case engineering organisms that actually produce an over reaction on the part of the body in terms of lymphokine and cytokine response to induce shock syndromes.

Hybrid agents. We've heard about small pox ebola hybrids. Recombination agents, which will be the equivalent of binary chemical agents whereby the two agents that go in a nominally avirulent in their own right, but in fact are capable of recombining within the body to create a virulent agent or, as we have recently seen some aspects of the
Soviet program, the equivalent of using a bacterium to carry in a virus, but the virus is only activated when the patient is treated with antibiotics so, in fact, providing a rather nice twist to the issue of protective defense.

And then presumably the most sinister element of all would be the question of latent integrated agents where you would use something like a retroviral vector to integrate an agent into the genome of a host with a controller gene, and you can, of course, activate the controller gene to activate the agent after it has already been in place when you presume that the political ideology of your enemy has become sufficiently offensive. The other element, of course, is moving beyond bugs, and this is what I've called here the brain bomb. In short, the other dimension of this is expanding the definition of bioagent beyond bugs. In short, as we begin to understand the exquisite molecular mechanisms that regulate this remarkable structure called the human body or, indeed, plant and animal function as well, the ability to understand those circuits means that simultaneously we gain the capacity to scramble them.

So that means that you can engineer a series, a complete spectrum of activity from transient immobilization, so in terms of crowd control or, indeed, troop control to catastrophic effects which can be acute or chronic, and the two most obvious areas where that applies are what we already know, the activation of inflammatory cascades. I referred earlier to bugs specifically engineered to elicit massive production of cytokines or lymphokines in the body. But I think some of the other more interesting dimensions to this are how do you actually scramble or trigger near a pathway. Think about the implication of wide induction of the ability to activate violence, induction of widespread lethargy. Some may argue it's already here, but --

(Laughter.)

-- but the overall issue is the fact that think about assault against an advanced economic power where you're capable of inducing significant behavioral shifts in an economically productive population. This also creates another conundrum to the extent that this is not so much bioagents in their own right, but by understanding the underlying biological design principles that regulate critical metabolic pathways within the body, you actually shift back to chemical agents to cause the dysregulation. So, in fact, it would be unlikely that you would use an infectious agent to induce widespread shifts in behavioral profile, but by understanding the specific mechanisms that regulate major cognitive functions and mood, you would then, in fact, use a chemical assault to induce that approach.

The other dimension which has already been referred to this morning is the increasing ubiquity of biotechnological capabilities. It would be interesting to reflect if Ted Kazinski (phonetic) had been trained in the 1990s whether he would have chosen to use bombs or would have walked along and dropped something into a hamburger plant as an alternative, as the ubiquity of Biotechnology 101 becomes increasing commonplace in the university curriculum around the world.
But the other issue, of course, and what this slide is meant to illustrate is scale and scalability. You can produce agents on a very small scale, as shown on the right, or migrate it through to very large scale production capabilities, as we know that the Soviet Union had committed itself to.

But the real issue is the fact that these technologies, in addition to changing the threat spectrum by definition, will also escalate the complexities of surveilling inspection requirements under the biological and toxin weapons convention because not only do we have a dramatic expansion in the number of theoretical dual use facilities under the convention because of the proliferation of biotechnology as an industrial enterprise. We're going to require an entirely new repertoire of analytical methods with which we must equip our inspectors if they're actually to sniff out what is really going on, and much of it -- there's a third hyphen there, cyber-forensics -- becomes very important because you can hide a lot of black activities in white databases simply by fragmenting those data sets. And at the same time, the nature and identification of bioagents under the general purpose criterion has to become increasingly broadened, and some of the examples are shown there on the slide, and as has been reflected in discussions with the farmer and biotech. industries, there is substantial resistance to arbitrary and capricious inspection, particularly from countries that might very well be interested in usurping intellectual property, circumventing intellectual property by gaining insight into what those companies are doing on a legitimate basis.

So it's a complex brew, but coming back to the principal issue, and that is the fact that you can write any scenario you want, if you want to hire a group of biomercenaries to put on an island somewhere, you can write your own scenario. Do you want to kill millions or do you actually just want to sustain a pattern of psychological operations against the great Satan? Do you actually want to declare a priori that will strike a U.S. city every third Friday in the month, not to kill people, but merely show that I can render your society vulnerable and erode confidence in government?

So we all know that the whole symposia and volumes are published on every type of scenario ranging from the catastrophic to the amusing that come forward, but the real issue is the fact that we have multiple agents, multiple agents in terms of bacteria, viruses, fungi; multiple targets within humans, plants, and animals; multiple environments in which that can occur.

So we've got multiple scenarios. That demands a wide spectrum of defense postures. This is far more complex than anything in the nuclear arena, far more complex than anything in the chemical arena. So we've got two choices. Is it paralysis or purposeful threat reduction? It is, indeed, complex, but it is not impossible.

Where do we actually find some of the more generic solutions that will be applicable to a variety of activities? And certainly something now I'm going to essentially focus on, some of the recent deliberations of the Defense Science Board, and that is working under the principle of one key element, and that is that faster identification saves lives, and in that I'm focusing primarily on the diagnosis of infection in people because, as this
audience well understands, the distinction between bio versus chemical and nuclear is the fact that no matter how grotesque chemical and nuclear may be, once the incident occurs, it is over. You know the extent of the carnage. You know the extent of the mop-up operation.

But in bio, the first time you will probably find that you've actually got a problem on your hand is when it's imbedded in the health care system. So when the emergency rooms of this nation were filling up with people with influenza-like symptoms in February of this year, how did we not know that that was not actually one of the major threat agents being used against us?

A lot of emphasis is being put into sensor technology, and we'll hear more about that from Dr. Alving a little later in this meeting, but this is an extraordinarily complex area to be working in, and I think that although she'll be talking about it, the Defense Science Board has now made a more focused effort to look at this issue of how do we improve the speed, breadth, and accuracy of clinical diagnosis, recognizing that the first time we'll probably see this is when it's actually in the health care system.

And what I really want to emphasize is the bottom box there. It's an integrated systems approach. You just can't have one element of this. You've got to be able to identify the agent. So we need better ways of identifying those agents. What are the fingerprints of those agents? How do we then actually build the diagnostic tests that exploit that knowledge to actually create the diagnostic tests themselves? That means nothing if you diagnose someone in Albuquerque if you can, in fact, mobilize that information into the network so that analysis and an automated computational network is key to faster mobilization of the medical response.

And one only has to look at the various reviews of the top-off exercise in Denver to see how you would overlay a grid of this kind. So how do we actually go about gaining this fingerprint of the various bioagents that may be used against us? And here is, in fact, where biotechnology can play an enormously important role whether it be at the level of the gene, genomic, or at the level of the proteins coded for by those genes, proteomic profiles. How do we go about profiling bioagents?

This does provide a capacity under Bullet 2 to simultaneously profile whether or not the bug has been engineered to make it resistant to drugs or vaccines. We need to archive samples from natural epidemics around the world. I think there is an extraordinary urgent priority as yet unrealized to profile this enormous inventory of agents that the former Soviet Union had assembled, and we also need to compare all of this against those organisms which are being used, but for legitimate intent by the pharma and biotech industries.

And what I'm now going to talk about has an undoubtedly parallel value in advance in public health, and it is essentially what I am referring to as the Zebra Project. If you think about the one thing which medics are taught around the world, it's the fact that the common diseases are, by definition, the most frequent. So if you hear hoof beats, it's
more likely to be a horse than a zebra. The dilemma in the detection of bioagents, of course, is the fact that the bioagent is the zebra. So come back to February 2000 when the emergency rooms are filling up with influenza patients. It was much more likely to be influenza, but it could have been any one. Seven of the eight top bioagents that could be used against us would, in fact, present with similar symptomatology.

So how do you detect the occasional zebra amongst this thundering herd of horses is really the principle, and the focus here one suspects will be on something which we've called the zebra chip, which is really building on this enormous set of rapid advances which are occurring in miniaturization technology to immobilize oligonucleotides or genes onto chips to profile genes, and in this case you'd be profiling microbial genes. So already comprehensive chips capable of identifying up to a million distinct genetic signatures imbedded on a two centimeter by two centimeter chip beginning to become available. So the idea would be to build up a comprehensive genomic and proteomic profile of both conventional agents, as well as bioagents; put those onto chips.

The middle slide, for those of you not familiar with, you can just sense the technician's hand putting that biochip into the reader, which then scans it automatically to define whether or not it's a horse or a zebra, but again, coming back to the principle of integration, it means nothing if you generate information to say that a zebra is present if you can't mobilize that into the health care network at large. So, therefore, this has got to be automatically coupled into a computational reporting network. The advantage, coming back to the principle of the fact that faster identification and intervention saves lives, is the chips is more than just a diagnostic entity. It's a fundamental element in triage and infection control. It permits you to scrutinize and segment your at risk population. So if this room had been exposed, some might have symptoms. Fine, we know what we've got on our hands.

But for the rest of you who may be presymptomatic, how do we identify who is infected much earlier? That is relevant not only to the utilization of scarce resources, such as antibiotics and vaccines. It may be particularly pertinent in the context of the larger population as to how we impose quarantine because we as a public health community have lost any site of the implications of imposing quarantine, and dealing with the question of how the media would respond to the imposition of a quarantine in a large urban population barely bears consideration. But this issue is also critical in the context of disease management because if you can identify the bug earlier, particularly if it's got any unusual characteristics, then it's the right intervention for the right patient, and the longer term, this also leads to the ability after the incident for a much more robust opportunity for forensic attribution and for retribution, which would stand scrutiny in the court of public opinion.

So what you need then, of course, is the data collection through the zebra chip network and other indicators which are also equally important, but as I've emphasized, this means nothing unless you've got a parallel development of a complex computational system which is not in place at the present time to actually net work that information in
real time to provide the tools for improved incident management and command control capabilities.

And a totally different topic, but the whole question of how you can use this information on bioagent signatures for the intelligence community and its capabilities is obviously a fertile area for expansion of skills in the intelligence community.

I'm not going to spend any time on medical responses to bioterrorism and biowarfare because there are others who are going to talk about the stark challenges in this arena, but I will talk about one aspect of it, which the Defense Science Board has been looking at, which is the drug and vaccine supply chain. If one takes the top 50 theoretical bioagents that could be used against us before you even more into the larger list of plants and animals, we really only have drugs and vaccines developed against 12 of those 50.

But even that still suffers enormous logistical shortcomings because one of the things of the friction free economy that's been achieved everywhere is the fact it's taken excess production capacity out of the hospital system. It has taken excess capacity out of the pharmaceutical production capacity.

So if top off had been real in Denver, we would have quickly run out of antibiotic to treat the population. If you look at even the recent approval of ciprofloxacin for the treatment of anthrax, we couldn't produce enough antibiotic at the present time to respond to short term needs. So there is an inadequacy of drug and vaccine stockpile. There is clearly, as we've seen in the debark with regard to vaccine development in the area of bioweapons, no incentives for the private sector to engage in this arena. We've concluded that DOD has underestimated the joint vaccine production requirements in this need, and there is a great ambiguity with regard to the ability to develop investigational trials and diagnostics under current FDA regulations.

So that means that not only have we certain current logistical shortcomings with regard to those drugs and vaccines which are already available. The other iceberg that sits out there under the water is the fact that we do not have drugs and vaccines for a significant category of agents who will be used against us, and in particular, major gaps against viruses. As many in this audience know, we really only have antiviral drugs against certain herpes viruses and the retroviruses, including HIV. Other than that, particularly for the hemorrhagic fevers, we have nothing. So we've got to really think about how we go forward over the coming decade in developing a much more focused R&D effort, again, with the engagement of the private sector.

But as Dr. Rodier emphasized at the beginning, all of this is also intimately linked to the premise of international public health surveillance. The ability of natural infectious disease to spread globally becomes a national security threat in its own right, and I don't want to emphasize any more on that other than to deal with one aspect of the biotechnological change.
If not now through bioterrorism, but an emerging infectious disease or even a traditional pathogen were to reemerge in our midst, how do we mobilize against an unexpected threat, whether it be natural or engineered? We have no surge on demand manufacturing capability, but a much more important and profound deficit in our knowledge is the fact that if Bug A appeared in our midst, we know little about how to rapidly identify the so-called epitopes, the immunizing component of those organisms. We not only do not have the tools to, even if we can sequence the entire genome of this bug when it arrives in our midst, we do not have computational tools that predict which are the most likely proteins which are going to be suitable for immunization. We have no logical tools to guide us as to whether we're going to activate the T helper one or T helper two pathway, which relates to the balance between antibodies and cytotoxic T cells in our body, but the most fundamental issue of all is time.

Vaccine production is biological. We either grow the bug or use recombinant technologies to isolate the gene for bits of that bug, and then produce those. But that takes a great deal of time. Typical vaccine production cycles, as many of you know, are anywhere between three and 18 months. That is a mobilization time that would not be suitable for dealing with an incident that occurred. So what we've really got to do, one of the great technical challenges for us is how do we actually create synthetic vaccines and convert a biological process to a chemical process.

Drugs, as you all know, are chemicals. Those are produced by chemical processes with shorter production times. Vaccines are biologicals. So how do we actually then convert a biological process to a chemical process and with it will come new regulatory complexities?

So in summary, ladies and gentlemen, what I've tried to emphasize here today is the fact that biotechnology has long been recognized as a dual use technology, but it is this dramatic quantal, disruptive dimension of biotech which is equally disruptive in the conventional civilian sector which is holding out great promise, but also raises a number of new challenges for national security. Part of that will be driven also not just by the ideological challenges that we will face from some of our enemies in terms of the attractions of biotech for asymmetric warfare, but the ubiquity of that technology will also facilitate that transition, and at the same time, we need to extend our dimension of understanding beyond bugs to understand that this will eventually over the coming decades also involve scrambling of intrinsic body circuits.

We are vulnerable, as is everyone in this regard. There's no particular uniqueness of the United States in this regard, but there are major shortcomings in any one of a number of sectors, and we nonetheless have the ability to utilize the potential of biotechnology, as I emphasized in the zebra chip dimension, to actually build a comprehensive surveillance network to better identify the threat when it comes. At the same time, we are vulnerable and must mount now a much more formidable effort to develop new drugs and vaccines, and I emphasize again that's equally important from the standpoint of emerging infectious diseases. New technology initiatives in diagnostics and therapeutics and vaccines will generate enormous parallel benefits for the civilian health care community,
and I think that these are absolutely vital efforts which I can assure you the Defense Science Board is paying a great deal of attention to, and perhaps the best way to close is with that statement.

(Laughter.)

Thank you very much.

(Applause.)

Jeffrey Koplan, MD, MPH

CDC's Strategic Plan for Bioterrorism

DR. HENDERSON: For our first presentation this afternoon or this morning, the second part of the morning, we're pleased to welcome Dr. Jeff Koplan. Dr. Koplan is Director of the Centers for Disease Control, and he's an Assistant Surgeon General in the Public Health Service. Jeff joined CDC in 1972 and had a 22-year distinguished career with leadership roles, I would say, in virtually every major program of the center, including I am happy to say some experience with smallpox, which I'm sure had a great deal to do with his future career. He left CDC in 1994 to become President of the Prudential Center for Health Care Research, but they recruited him back to CDC two years ago to assume the position of Director. He's a graduate of Yale and the Harvard Schools of Medicine and Public Health. Two years ago CDC was charged with taking a lead role in the civilian bioterrorism preparedness, and since that time, remarkable strides have been made. It is a special pleasure to have Jeff with us to discuss CDC's strategic plan for bioterrorism. Jeff Koplan.

(Applause.)

DR. KOPLAN: Thank you, D.A. It's a pleasure to be here with you today, a challenging subject, a challenging topic.
I was sitting here this morning, and it crossed my mind that probably over half this audience are writers keen on writing the next bio horror disaster thriller and here to get material.

(Laughter.)

As D.A. said, based on a charge from Secretary Donna Shalala in 1998, CDC has been given a lead public health role in efforts to strengthen the nation's capacity to detect and respond to a bioterrorist threat. The mission in responding to bioterrorism is not that much different from our overall mission, and indeed, I view what we're doing as an extension of longstanding roles and responsibilities in public health.
Over the past 50 years, CDC has seen a decline in the instance of some diseases, an increase in some others, and many new diseases. In the last 30 years, we've had 30 new infectious diseases that we've been confronted with, some of whom have become fixtures in our battles: HIV, hanta virus, Legionnaires, toxic shock syndrome, Lyme disease, and others that have waned and waxed over the years.

We estimate that CDC is involved in 800 to 1,000 field investigations every year, and these days our new focus of activity is on both emerging infectious diseases and bioterrorism in the infectious disease realm. What are we doing to address this challenge? Well, for one, I’d like to make it clear that we don’t think we have finished addressing it. We’re barely getting started. We’re not there yet, but we do feel we’ve made significant and substantial gains even in the past year, and that’s what I’m going to share with you today. But I think as you've heard from this morning’s earlier speakers, the immensity and the depth, the range of the challenges before us are so great that there will be no point in this process where we can sit back and say, "Well, we’ve done it. We’re prepared, and we’re ready to go." That's not going to be a feature of the challenge of bioterrorism.

We’ve developed a broad based strategy that has complementary and coordinated improvements in bioterrorism related preparedness as our goal, and this is going to take place at federal, state, and local levels, and we’ve involved a large number of consultations and partners in this to put this together. Many of the groups are outlined before you, but they include the Association of State and Territorial Health Officials, Association of Public Health Labs, Council of State and Territorial Epidemiologists, American Society of Microbiology, Infectious Disease Society of America, and the Center for Civilian Biodefense Studies at Johns Hopkins, as well as a number of others. The plan addresses a variety of issues, but there’s an emphasis on enhancing capacity for detection, diagnosis, and management of disease outbreaks; improving the characterization and identification of causative pathogens, toxins, and selected chemical exposures; strengthening public health response capacities to control and contain such emergencies; and improving our information technology infrastructure so that we can rapidly transfer data and information needed to prepare and respond to these events.

First and foremost in our minds is to insure that we have the appropriate level of preparedness and response capacities at local and state levels in both the public and private health care systems. The first signs of a bioterrorist event will be observed at this level, and it makes sense that we place our greatest efforts there as our first lines of defense.

However, preparing communities to address the dangers of bioterrorism is a major challenge. A critical step in meeting these challenges is to reexamine the core public health infrastructure in the United States. This term gets used a lot, and for those of you who are not in the public health community, it involves disease surveillance, detection, monitoring, and reaction to health events, a wide range of health events, training of health personnel, and a wide range of disciplines, health communications, and laboratory capacity. Enhancing this core public health infrastructure will enable public
health agencies and primary health care providers who are the front lines of response to detect and respond rapidly when an incident occurs. Indeed, when that magical ship is available that does the ten to the sixth, ten to the seventh test and gives us that information that George referred to in the presentation earlier, it will still require these laboratories, these individuals to get those specimens and use these chips and put them into place so that there is a good meshing of this improved biotechnology that we'll have available to us as a tool with people and skills and responsibilities that exist now at local and state levels.

We have gained some additional resources for this effort in the year 1999 and the year 2000. Over $275 million have been appropriated to CDC to help insure efforts occur associated with bioterrorism preparedness and response. Apart from the pharmaceutical stockpile and some other congressional earmarks, the major share of these funds are awarded extramurally to state and local bioterrorism efforts. And with these funds, public health agencies have begun to develop capacities and enhance existing public health infrastructure in ways not possible without the infusion of such monies. Specific activities include development and implementation of information systems used to monitor disease trends, detect outbreaks, and improve public health decisions, such as the National Electronic Disease Surveillance system, NEDS, and the Health Alert Network, HAN.

I remind some of you who haven't worked in state and local health departments that our public health communications surveillance network, computational network, has lagged that of many other sectors of our society. Many of my public health colleagues, particularly at the community, county, city level are still working on technologies that involve paper and pen, telephones, while their kids are at home using the web and internet to order from Lands End and Toys R Us.

(Laughter.)

We would like to correct that gap. One of the things we have been working on is improving local capacity to assess what their characteristics are and what their needs are and to provide some standards. We work with the Department of Justice to implement an assessment tool for local public health agencies, and this has already begun to reveal important pieces of information useful to them and to us nationally.

Since the inception of the bioterrorism initiative, CDC has worked hard to improve our own capacity, and a number of our staff are here today and I'm sure will interact with you. Dr. Jim Hughes, who is Director of our National Center for Infectious Diseases, and Scott Lillibridge and his colleagues who are in the bioterrorism and preparedness program. One of the things we have emphasized is improving our laboratory capacity. Prior to the inception of the bioterrorism initiative, we had limited capacities for many bioterrorist agents, which some of them we had had at one time and lapsed over the years. We've improved on our in-house ability to test for five of the six pathogens listed on the critical biological agents Category A list, plague, tularemia, botulinum toxin, small pox, and viral hemorrhagic fevers, and have added the ability to test for anthrax.
These six critical agents represent diseases that can be easily transmitted person to person, cause high mortality, and might cause public panic and social disruption. They require special action for public health preparedness. Rapid identification, triage strategies, new labs, and staff provide increased national capacity to respond to such events, and we continue to work with state and local partners to insure that they develop capacities to test for other critical agents as well, such as Q fever, Glanders, brucellosis, alpha viruses, Staph. enterotoxin, et cetera, et cetera. And many of the state health labs have improved their capacity even over the past year. So there’s been a marked increase in capability with more improvement to go in state laboratories around the country. One of the other areas for progress and improvement has been developing a new, rapid response in advanced laboratory at CDC for bioterrorism, which specimens come into the lab, are triaged, and initially process samples are processed for both chemical and biological agents, and then there’s linkage with around-the-clock, rapid response teams to provide an assistance.

Chain of custody is maintained throughout this process, and we're using new, rapid diagnostic assays that can then be transferred more broadly around the country. To date over 600 specimens have been logged into the rapid response and advanced technology laboratory, and they themselves tell a story of threats going on around the country that are as recent as the last few days and involve a wide range of threatened agents. Thankfully they have remained threats.

Approximately two years ago CDC recognized the need to assure that appropriate laboratory testing capacities for critical agents existed throughout laboratories throughout all of the states, and we’ve worked with associations, state, and territorial public health labs, Department of Justice, and the FBI, the Department of Defense, and developed a national response, national laboratory response network. This secure network provides standardized diagnostic protocols and reagents needed by state public health labs for plague, tularemia, anthrax and botulinum, and it also offers help in to test for specific agents, other agents on the critical agent list. This function helps to share information and communicate best practices, and we are increasing the number of people trained in it and laboratories that are participating and hope to increase that further in the year 2001.

We're looking also to develop standard methodologies for laboratory testing and developing techniques to rule out potential bioterrorism agents. Another important area is epidemiology and surveillance. Critical to CDC’s bioterrorism preparedness effort is early detection of an event coupled with effective and timely response, and you'll hear that theme over and over. You've heard it earlier this morning. You'll hear it over and over again. A key issue is early detection. Because that early detection and initial response will be at the local level, we are working with epidemiologists at state and local health departments to acquire and develop and maintain the resources and expertise necessary to respond to rare, unusual, unexplained illnesses. The zebra was alluded to earlier.
As of now, all 50 states, the District of Columbia, and New York City, Chicago, and L.A. are supported by funds to enhance their epidemiologic and surveillance capacities. These funds are being used to hire surveillance coordinators, epidemiologists, support specific local events in training, rapid reporting and response teams.

In keeping with the lessons learned from the West Nile outbreak in the Northeast, some states are also developing reporting mechanisms with medical examiners, poison control centers, hospitals, EMS units, animal health care providers, and other nontraditional partners to enable early detection.

Working with state and local partners, CDC has also developed disease specific information for health care providers, emergency first responders in the public that will instruct them in what to do during an actual bioterrorism event. Working with the U.S. Army Medical Research Institute of Infectious Diseases, CDC has trained over 15,000 health care providers, including emergency room physicians and infectious disease practitioners via satellite training. Some medical schools have even included bioterrorism lectures in their curriculum, which is certainly a sign of progress and difficult in a competing medical school curriculum where all new subjects are viewed with question and if not disdain.

In addition, CDC is working with the Infectious Disease Society and other infectious disease groups to develop training materials targeted at these medical specialties to help them detect, recognize, and respond to bioterrorist events. The West Nile encephalitis outbreak, which I believe you’ll hear more about this afternoon from Marcie Layton, typifies how improved public health infrastructure is vitally needed to deal with ongoing outbreaks of both naturally occurring infections, as well as bioterrorism.

Improved laboratory and surveillance capacities make a big difference in rapid response and appropriate outbreak control, and as the term has been used already, needed surge capacity, whether it’s in hospitals, in pharmaceutical companies, in laboratories, in health departments, has to be there to deal with these unforeseen events.

In the research area, CDC, along with the National Institutes of Health continues to make investments in research and development associated with vaccines. To better prepare the U.S. against the possible use of small pox virus, CDC has awarded a contract this year to Ora Vax of Cambridge, Mass., to produce small pox vaccine. Approximately 40 million doses of vaccine will be produced initially with anticipated delivery of the first full scale production lots in 2004. The contract allows for increased production of the vaccine should the need arise.

To address overall vaccine issues associated with bioterrorism, a working group of representatives from the Department of Health and Human Services, many different parts of the department, the Department of Defense, USAMRIID and the U.S. Department of Agriculture was recently formed to address and evaluate vaccines that are both currently available and what others may need to be developed.
In addition, a variety of academic institutions have been funded to support bioterrorism preparedness and response, and these institutions are performing work that is associated with development of national policies and structures to prevent civilian populations from experiencing bioterrorism, improving computer based surveillance systems, establishing a center for research and education, and conducting studies of viral hemorrhagic fevers. Each of these research activities we hope will provide insights helpful to us in the governmental agencies at all levels.

There's also been progress made in the national pharmaceutical stockpile. Our strategy is to have both preparedness and response efforts in place, and in this case, it involves having a key component of that preparedness be a national pharmaceutical stockpile. It's organized into two pieces. The first component includes eight identical push packages. CDC has placed strategically at distribution centers around the country. These are 12-hour push packages, meaning that within 12 hours of release, they can be on site anywhere in the United States. They're made of 109 palletized air cargo containers. It takes two airplanes to deliver them, and they comprise pharmaceuticals, IV fluids, airway supplies, emergency medications, bandages, and dressings. These items are necessary to enhance state and local capacity to provide therapeutic treatment and prophylaxis of a large population.

In addition to the 12 hour push packages, CDC will also use VMI, vendor managed inventory, to provide specific quantities of antibiotics and other medical materials to the requesting agency within 24 to 36 hours after the decision to deploy. This is in partnership with the Department of Defense, rather, the Department of Veterans Affairs.

We're also doing extensive training of staff. We recognize that local expertise needs increased experience and training in these areas, and recent experience in the top off exercise indicated that we quickly exhaust our resources and personnel both nationally and locally and need to develop some other contingency plans to have more staff available for this.

Other key areas that we've invested in are information technology, improving both accuracy and timeliness in data, and doing this at levels including national and local and state, and have begun to test in field responses at the World Trade Organization meeting in Seattle in late '99, and at the two national conventions for the political parties this year we used some new, more creative approaches to rapid and accurate data response systems.

We're also trying to improve the moving away from paper and pencil and telephones to a true national electronic disease surveillance system and have made considerable progress in this in a number of states around the country with grants. That includes improving security, having some common standards, and developing some software packages that all states can use in this. And two states are doing this particularly intensively: New York State and Oregon. And we hope the best practices from these states will then be used in other locales.
We are also trying to meet a need that state epidemiologists have asked for for some time, which is to create a national clearing house for outbreaks and investigations ongoing. We have created a new program called Epi-eXchange, in which states can enter these processes with all of the information in real time, and then they're shared with other state epidemiologists who have access to this information via the web, a secure website.

Many of you have heard of the exercise performed in May of 2000 called top off, referring to top officials in which a mock exercise was done in three cities simulating a biological threat of a plague outbreak in Denver, a mustard gas release in Portsmouth, New Hampshire, and a simulated radiologic incident in Washington. This was a relatively expensive exercise engineered and run by the Department of Justice, but I think it was highly worthwhile for all of us. Most of our staff were heavily involved in this for the several days of the event, and I can tell you from being an active participant that this same level of gastric upset and need for frequent changes of clothes occur; even though you were saying to yourself, "But this was an exercise," it was an exercise that took on real meaning for the participants, and many of our folks who were here spent day and night working on this for several days. It indicated a number of lessons and challenges that we need to pay attention to. There were difficulties in implementing and exercising federal, state, and local quarantine authorities. There were complications in local distribution of the national pharmaceutical stockpile once it got to the state. There was a complexity in providing support for expanded health care delivery. There was limited hospital capacity, limited clinical care capabilities. Long-term outbreak control strategies were not well in place, and there were chain of command issues present.

This is all well described, and I'd urge those of you who haven't read it in the recent newsletter of the Johns Hopkins center, a very nice description there in 12 pages, and I'd urge you to take a look at it. We are addressing all of these challenges and trying to correct them one by one as part of what we're doing.

In summary, dealing with these issues involves looking at things from a federal level, from a state level, from a local level. All of those areas have to be improved. Academia has to be brought into it and develop the capacities that currently don't exist in most public health schools, management schools, medical centers. The wide variety of federal partners have to be better linked to each other, and the traditional first responders have got to be linked to the public health system, and in addition, linkage between our national effort and international efforts for our partners at WHO have to be further improved.

All of this has to be done via obviously a need for increased resources to do it, partnerships with other groups, the systems to put it into place, research training and technical support. We will get there, but it requires a lot more work.

In parallel to the "be paranoid" slide, I have a picture of our moderator at an earlier stage of his career.
And I think that's the tack we all have to take no matter what our roles in this effort are. If we do what we need to do, we can minimize the consequences of untoward events that we've heard described earlier. We can improve the nation's public health infrastructure not just for bioterrorism, but for emerging infections and a wide variety of health issues, and we'll end up with a safer, healthier population.

Thank you.

Richard Falkenrath, PhD

US Domestic Preparedness and the Complex Threat of Bioterrorism

DR. HENDERSON: Our next speaker is Dr. Richard Falkenrath, who's Assistant Professor of Public Policy at Harvard's Kennedy School of Government and Director of the Executive Session on Domestic Preparedness. He's the author of a number books, the most recently being America's Achilles Heel, Nuclear, Biological, Chemical Terrorism and Covert Attack.

He's a member of the Council on Foreign Relations and a frequent consultant to the Departments of Defense, of Justice, as well as the intelligence community and private industry. He's a graduate of Occidental College and holds a doctorate degree from the Department of War Studies, King's College, London. His paper is entitled "U.S. Domestic Preparedness and the Complex Threat of Bioterrorism." Dr. Falkenrath.

(Applause.)

DR. FALKENRATH: Thank you very much, D.A. I'm honored to be here.

I don't have very elaborate slides. I apologize, and I'm going to focus my remarks today on the organizational dimensions of civilian biodefense. I'm from a school of government, and this is my expertise. I don't have very much to add to the technical expertise that's already been brought before you today. But on the organizational side, I do think I have a few things to add.

I'm going to start with my conclusions, and these are based on five years of observing the country's efforts to prepare itself not just for bioterrorism, but all forms of high consequence domestic terrorism.

So to begin with the conclusions, first, I think without a doubt U.S. biodefense is
disorganized and excessively fragmented. I'm going to support these conclusions with some analysis. I just tell you right now so that you know where I'm going.

Second, I think it's clear that these organizational problems are undermining the effectiveness and efficiency of our national system to prepare for and respond to a bioterrorist event at home.

And, third, therefore, I think it's beholden upon the next administration to enact an appropriate set of organizational reforms. There will be very complex. I'm not going to be able to get into them entirely, but I will give you a few suggestions.

Now, in my judgment, Washington, if not the nation, is now past the stage of broad consciousness raising about the threat of biological terrorism, and I would say good riddance to it. I think there have been far too many loose, sometimes shrill, and often simplified and inflammatory statements to the public and the media about this, and I think that needs to stop.

What we need now is quite careful, expert level analysis of the problem of the sort we saw earlier this morning from Dr. Poste, I think. It strikes me that further efforts to raise consciousness about this threat broadly are they sound increasingly shrill and exaggerated.

There is, of course, an intellectual reaction going on right now to the prevailing assessment of this threat. That's entirely natural. There's a growing body of work that supports it. I don't want to get into a debate about that issue, but I think it's fair to say the issue of bioterrorism and the need for a national system of preparedness is now firmly lodged at least in Washington in the federal Executive Branch and I think also in the Congress.

And so I take this as good news. I think we've made significant progress on this issue and really probably over the last year. The first one of these symposiums spent a lot more time trying to raise consciousness about this threat. Now we're getting down to the serious and much more difficult business of building a system to respond to it if it happens.

However, and I think this is bad news, there has been a great deal of real progress made very quickly and very impressively in parts, but as we've begun serious efforts to prepare ourselves for the threat of bioterrorism, I think the great difficulty of this endeavor has become apparent to us all, and it's really a difficulty of implementation. It's not at the level of sort of policy conception. We think we've got the right ideas or a conventional wisdom at least has emerged on what the right set of ideas are.

But as we try to implement these things, they turn out to be very difficult, and I think it's worthwhile to be clear about why that's the case. What are the sources of difficulty building an effective system for bioterrorism preparedness, and I think there are really three.
First, on the threat, we've got no specific information about the threat. We've got lots of scenarios, but we don't know what sort of weapons will be used. We don't know how big the attack will be. We don't know the agents that will be used, how they will be delivered. We don't know when an attack will happen, where it will happen. We don't know how likely it is.

Essentially, we have no specific information about the threat. We have a very abstract statement of a range of possibilities, some of which are more worrisome than others, but we have no specific problem definition. This makes planning immensely difficult. As all of you know, it's much harder to answer a poorly specified question than to answer a well specified question.

Now, many of us, including myself, would like greater specificity and certainty about this threat. We'd like to know concretely which agents are more likely to be used than others or how big the attack will be or how sophisticated the attack will be, but in my view that quest for ever increasing levels of certainty and specificity about the threat has become vaguely Quixotic and something of a fool's errand.

I've lost count of the number of GAO studies that call for greater specificity and treat assessment, and there's really no way to provide it. It's not there.

The problem is that uncomfortably high levels of uncertainty, uncertainty, in here in the nature of the bioterrorism problem. Take, for instance, the question of probability. How likely is an attack?

Well, I think -- and I will state this -- terrorism is not a statistically patterned phenomenon. We can't -- and in a sense that makes the notion of probability for terrorism sort of meaningless. Rather, terrorism is a strategic phenomenon. Every terrorist act is a result of a conscious decision by some intelligent, reactive individual or set of individuals, and that to my way of thinking at least makes it statistically non-patterned and, therefore, very difficult to talk about probability.

I see no basis for saying a major attack of bioterrorism is inevitable for that reason because there is no certainty that deterrence will fail and that individuals will not continue in the future to decide against waging this sort of warfare.

But that's not to say that the probability is zero either. I think all we can really say with certainty is the probability is pretty low. It has to be. It's the only way you can explain the rarity of occurrence in history of biological. This is what's known as the frequency theory of probability. You get the sense of future probabilities based on past frequency, and I think our only safe conclusion is it's pretty low in aggregate, and at any specific time and place, it is vanishingly low.

But that's about all we need to say about it because the reason bioterrorism has risen on the national agenda is basically because of a national security calculation that is
concerned with the severity of the consequences if it happens, and given the severity of those consequences, the judgment that I make and that is shared by many people in Washington is that the probability is sufficient to take it fairly seriously and to enact a prudent set of preparatory measures, which is what we're doing today.

The second reason for complexity: the enormous technical -- the second reason for difficulty in civilian biodefense is the enormous technical complexity of the attack scenarios and appropriate response. I really have very little to add to this beyond what was heard in the first session. It's not my area of expertise. So I'm not going to get into that, but let's just say by any measure, this is an exceedingly difficult mission to deal with, attack recognition and appropriate response after the attack. Very, very difficult.

To make matters worse, however, that technical difficulty overlays a very fragmented set of institutions that have to implement such a response system. In effect, I would say this new mission of civilian biodefense has been dropped in upon an organizational landscape that is uncharted and basically unfriendly to the mission. Civilian biodefense is, to use a phrase coined by my colleague at Harvard, Ash Carter, a homeless mission. Why? Well, it's new, first of all. It's never been done before, not in the United States and not in any other country, not in the way we're talking about it today.

And, second, there is no single logical home for all of it. There are single homes for big parts of it, but not for all of it. So as someone from a school of government, this last set of issues, this institutional fragmentation is what I'm going to focus on, and I'm going to try to tease out why I think the bureaucracy is so fragmented. To do this, and to try to explain what the organizational challenges we face as a nation in building a more effective system of biodefense, I'm going to divide it into four levels, four layers of fragmentation and disorganization and go through a little bit on each one.

First, the federal Executive Branch. Response to a bioterrorism incident, as all of you know, will be drawn from many different professional disciplines. Obviously medical professionals and public health professionals will play extremely important roles, but they are not alone. It will also be a law enforcement issue. It will also be a national security issue. It will also be an issue of emergency management. It will also be an issue of intelligence.

All of these different response elements, if I were to say, need to be pulled together and coordinated in some reasonably coherent fashion, and there's only two options of who can do that at least at the federal level, and that's the White House and FEMA. And at the moment we say both are going to do it. The White House in some sense claims this responsibility in PDD-62, and FEMA also has it statutorily.

In my view, neither is really doing the job very effectively, not at least in the level of program coordination. There is some policy coordination so that everyone has basically the same talking points, but at the level of program coordination and making sure the system works as a whole, I think we've got a long way to go. And let me just note I'm coming across as fairly critical here, but I also recognize this is a very new program, and
these sorts of problems are not at all unusual in the early implementation of such a complex program. So this is entirely natural, and it doesn't have to do with any of the specific individuals who occupy these offices. It's just the way governments react to new problems dropped in upon them.

Now, I could go through each of the individual departments in the federal government and give you my sense of where the organizational disconnects are, and there are many. We've already heard a little bit about the problems in the R&D area, but let's just focus for a moment on the medical community and the Department of HHS. HHS was very slow to the table on this issue. The master preparedness for high consequence terrorism got going in about 1995, obviously reactive to the Ashun Richio attack. HHS has been a significant player in this area really only since late 1998, early 1999. In that time, they've made enormous progress, and I think it's to be commended, but the system that the Department of HHS brought to bear in this, I think, is unusual and probably not how we should continue to do things.

Essentially the only Senate confirmed official in the Department of HHS who can spend any real time on bioterrorism is the Assistant Secretary for Planning and Evaluation, Peggy Hamburg. She's played that role. She's played it because of her personal interest in the issue and by default because no one else was, but she had no standing mandate to do that and had inherited no staff that positioned her to do that, and this, I think, is a significant organizational gap that needs to be corrected going forward.

Now, CDC is clearly the right place to locate the bulk of our specific programs to prepare for management of the consequences of a bioterrorist attack. No question about that, and it's created an impressive program in very short order. However, CDC is based in Atlanta, and as such, it's geographically segregated from the national security and intelligence and emergency management institutions that are also involved in our response. Furthermore, CDC has other priorities, quite understandably, which and by many people's judgments are under funded, and this in a way seems like a new mission that seems to be getting a disproportionate level of funding by the existing way of thinking.

I don't mean to be overly critical here, but let me just say I think the notion that you can create a program in CDC without clear oversight back in Washington of it and strategic direction of that program is problematic. Second, the federal Legislative Branch, the Congress. Well, the Congress, in fact, got us started in this business back in 1995 with a domestic preparedness initiative that the Executive Branch did not ask for, the Nunn-Lugar-Domenici Program.

The Congress has continued to take the initiative and create additional new programs in the general area of domestic preparedness for high consequence terrorism. While this initiative, I think, is commendable, at a point it starts to create its own problems because these programs established by the Congress acquire in a way a life of their own, and since most of them were basically earmarks in specific appropriations bills, there is very little ability for anybody in the federal Executive Branch to coordinate them. They
simply must be implemented. They're part of a law signed by the President that said these monies will be spent for this purpose.

Furthermore, Congress has too many committees doing oversight. In the broad area of terrorism and WMD preparedness, there are 11 Senate full committees and 14 House full committees that claim oversight authority in one way or another, each one of which has numerous subcommittees. I can't get into them. Congress further would like to tell the Executive Branch how it should organize itself. In the past five years I am aware of about a half dozen congressional efforts to reorganize Executive Branch in this general area that we're talking about, not just biodefense, but counterterrorism and/or weapons of mass destruction. All half dozen, all six have failed, and none enjoy the support of the Executive Branch.

Finally, and I think we should be clear about this, as we look at the budget being devoted to WMD preparedness nationwide, and I think the level is now 1.3 billion, I see an increasingly wide stratum of pork in there. A growing number of politically motivated programs, programs that did not derive from Executive Branch requests for specific capabilities in a specific place, and I worry about this a lot.

People don't often say these sorts of things in public, but being a professor, an academic, I think someone should say it. We have to watch out for the politicization of this budget, and it's happening very fast. So I think it's a serious problem. The Congress shares responsibility for some of the organizational problems present in the federal Executive Branch.

Third, federal, state and local relations. I completely endorse the remarks of Dr. Koplan, and it is essential that the federal government work very closely with state and local government in building capacity nationwide to detect and respond to bioterrorist attack. There's also a legal basis for this. The Tenth Amendment of the Constitution gives the states and governors principal responsibility for public health and for emergency management, and that's why in our history states and local governments have developed those capabilities in their own regions.

So the federal government must, for reasons of practicality, leverage off of those existing systems, but it's been difficult. It's been very difficult for the federal government to figure out how to do that efficiently and for several reasons. First, state and local government in America obviously is not organized in any clear hierarchical way, and it's exceedingly diverse. It's just a very rich set of organizations out there with a great deal of diversity and difference across them, and it's hard for the federal government to figure out an efficient template for dealing with them all.

Plus, state and local governments have different priorities, and they don't necessarily share this one. They don't necessarily share civilian biodefense because they're not responsible for national security, and this issue emerged on our agenda from a national security calculation.
In my judgment the federal government needs to get much more serious about an effective interface with state and local government and also has to deal with the resistance in all federal bureaucracies of moving money out to build resources at other levels of government. And I think the CDC and DOJ are commended for recognizing that resources do have to move across the layers of governance in America, but I think the ratios are still too small.

Finally, private sector and public sector. It's a very difficult one. As we all know, medical care and biomedical research in the United States and insurance is principally, primarily privately owned. We need to figure out a way to create incentives hopefully in a positive sense in that sector to build the surge capacity we need, we will need in a bioterrorist incident, and right now we don't have the right idea.

And I don't have a simple idea to give you on how we should do this, but it's clear to me we need to rethink how we're communicating with the public biomedical and health care sector and get them better engaged in building the capacity we are going to need to respond appropriately to this problem.

I've got one minute left, and I will give you very briefly -- the next slide -- a summary of - next -- four big -- the first bullet point, please -- four big institutional ideas that I think need to be enacted here. I think we need a new Assistant Secretary of HHS for national security. This person would be Senate confirmed, would provide oversight for the existing OEP in HHS, would have a robust staff, all with security clearances to engage this problem appropriately. It would also provide oversight of the CDC program and the FDA and NIH programs that exist already. In effect, there would be a dotted line that would supplement the hard line that goes from the Secretary to the Director of CDC to the Director of the CDC program. There would be a dotted line that goes around that. Second, the next bullet point, we need to enhance White House coordination. Next bullet point. We need to have a presidential domestic terrorism advisory board to help us with this interface with state and local government.

And last, we need to consolidate congressional oversight in some reasonable way to get the number of committees engaged in this process down to a reasonable number. Thank you very much for you attention.

(Applause.)

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**Col. Edward Eitzen, MD, MPH**

**Reducing the Biowarfare Threat: International Collaboration Efforts**
DR. INGLESBY: It is my special pleasure to introduce to you this panel's moderator, Colonel Ed Eitzen, who is Commander of the U.S. Army Medical Research Institute of Infectious Diseases, or more commonly known as USAMRIID. Colonel Eitzen has had a distinguished career. He received his undergraduate education at the University of Alabama, as well as his medical degree. He had residency training in pediatrics at the Fitzsimmons Army Medical Center; received his M.P.H. at the University of Washington. He did his preventive medicine residency -- I know. When will this end? He had residency after residency at Madigan Army Center, and then became Board certified in pediatrics, emergency medicine, and preventive medicine. He has received numerous military distinctions. He currently serves as Commander at USAMRIID, which is the lead medical research laboratory for the U.S. Biological Defense Research Program. He is also an extremely nice man, and a great collaborator.

(Laughter.)

DR. INGLESBY: And a good friend of ours at Johns Hopkins. It is our special privilege to have him as moderator of this working lunch. Thank you, Ed.

(Applause.)

COL. EITZEN: Thanks, Tom. I appreciate that very nice introduction. I have to make one correction, however, and this harkens back to my upbringing in Alabama. You said that I went to undergraduate school to the University of Alabama, and that's not true. I'm an Auburn graduate.

(Laughter.)

COL. EITZEN: And I have to correct that because it's kind of like the McCoys and the Hatfields in Alabama, but thank you.

I'd like to thank all of the staff of the Hopkins Center for Bioterrorism, including Drs. Henderson, O'Toole, and Inglesby, for inviting us to participate today in this outstanding symposium where we come together and talk about so many important issues.

We also consider the Hopkins Center and the staff of the Center to be very esteemed colleagues and friends, and we've had an outstanding working relationship over the last few years. So from USAMRIID and from the Medical Research and Materiel Command, I would like to express my thanks to you for all of the great work that you're doing. I think it's very, very important work.

I'm just going to make a few opening remarks and leave as much time as possible for our speakers today. The title of our lunchtime session is "Reducing the Biowarfare Threat: International Collaboration Efforts."
One of the major reasons why we worry so much about bioterrorism today is because of the concern of proliferation of the technology for producing biological weapons from state sponsored biological programs, such as that of the former Soviet Union or Russia, that of Iraq, and that of other nations who have been engaged in this type of activity, some of which were mentioned this morning.

I think there should be no doubt now to any of us in this room that those with interests that are anathema to the United States will use whatever technology is available to try and hurt the United States or its interests, and we only have to look to recent events like the embassy bombings in Africa and the bombing of the USS Cole to be reminded of that.

And certainly most terrorists to this point have used large explosive devices, some of which like the one used on the Cole obviously very sophisticated devices, but when they will go toward using the next step in technology is only a matter currently of conjecture.

One of the greatest threats that we face, I think, is biological threats or other weapons of mass destruction threats to key international events, like events like the Olympics or conferences involving world leaders and that sort of thing.

But I think when we think about terrorism, you know, we have to think of it in terms of four aspects for the terrorists. One is access to the agents. Another is the science of being able to manufacture the agent appropriately. A third is weaponization of the agent, being able to disseminate and deliver the agent, and the fourth part, which is more difficult to get our arms around, is intent to use the agent.

And you know, the remarks made this morning about the role of national leaders like Saddam Hussein and others like him or terrorist leaders like Osama bin Laden kind of highlight that fourth aspect in our minds. For most biological attacks, you would have to be able to do all four things to be able to carry out an effective attack, and I would say the one exception to that would be if you have access to a communicable disease agent, like smallpox or plague or possibly one of the viral hemorrhagic fevers, where really the only part of that you need to have is access to the agent, and you could use a human being as the carrier vehicle for transmitting the attack onto an unsuspecting population.

Finally, in discussing the international aspects of this issue, we have today with us, I hope -- I know we have one. I hope we have both of our speakers available today -- two highly qualified individuals to talk about these aspects.

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Jerome Hauer, MPH

Olympics 2000: Preparing to Respond to Bioterrorism
COL. EITZEN: I'm privileged to introduce the first of these two outstanding speakers and leaders in the field of bioterrorism to you. Our first speaker is Jerome Hauer, known to most of us as Jerry, who is currently Managing Director of Kroll Associates in New York City. Jerry is a long time colleague and friend of many of us. He's one of the world's leading experts on biological and chemical terrorism. He was one of six national experts chosen to privately brief President Clinton and Vice President Gore and four cabinet Secretaries on Good Friday of 1998 on the specific issue of the biological terrorism threat. He's formerly Commissioner for Emergency Management for the City of New York, the Office of Emergency Management from 1996 to 2000, and he set up what has been widely recognized in the interagency community as the best large city preparedness program for biological terrorism in this country. He has recently done extensive consulting work with the Australian officials for the Sydney Olympics, with Scotland Yard, and with the Israeli government on these issues. And his talk today is going to be the "Olympics 2000: Preparing to Respond to Bioterrorism." Please join me in warmly welcoming Mr. Jerome, Jerry, Hauer.

MR. HAUER: Ed, thanks very much. It's a pleasure to be here today. I, too, want to congratulate D.A. Henderson, Tara and Tom. You know, it's always -- as I've said to D.A., when you're done curing the world of smallpox or eradicating smallpox in the world, you've got to find a new challenge, and knowing the kind of person D.A. is, there's never going to be any grass growing under his feet. He took on a topic that is going to be something we're going to be confronted with for many years to come, and if anybody can take this on and make some sense out of it, it's certainly going to be D.A. and Tara and Tom, and they deserve a lot of credit for all of the work they've put into this symposium.

What I'd like to do during the next 20 minutes is basically tell you a little about the Olympics in Sydney or in Australia because it was not just in Sydney. Unfortunately this talk might, you know, tend to get a little boring because nothing happened. I mean, you know --

(Laughter.)

-- the bottom line is, you know, it's great to come up here to do one of these talks after you've been through an event like the World Trade Center and you sit there and talk about all of the blood and guts and all the stuff that happened, all the people you carried out. The bottom line is the Australian government did a great job. They deserve a lot of credit.

I do want to take you through some of the thinking that went on, some of the issues that we confronted not just in Sydney, but in some of the other states in Australia, and hopefully right after lunch not put you to sleep because nothing did happen, but talk to you about some of the things that we had to confront.

First, just if you're kind of a dope like me who flunked geography back in, you know, junior high school, you know, when the first call came about three years ago that they
asked me to come down to Australia, I kind of figured I'd look at a map and figure out where the hell I was going, and you know, I wanted to know.

My first role was actually down in Melbourne. D.A. and I went to a meeting of the Virology Association down in Sydney to do a talk, and in trying to understand the geography of Australia, and there's a rationale for me saying this, Australia is about the size of the United States in square miles, and it doesn't look that way. There's only about 13 million people in Australia, but as you look at the Olympics themselves, a lot of what went on with the Olympics was in Sydney, but if you look at the little map of Australia on the side, you'll note that Adelaide, Melbourne, Canberra and Brisbane were also sites for the Olympics, and when you look at the size of Australia, those parts of the country from Brisbane down to Melbourne is about a three-hour flight. Driving from Melbourne to Sydney is about ten hours.

So you've got to think about that when you think about resources and having resources basically spread out from Maine to Florida as you're trying to deal with planning for the Olympics. The Australian government dealt with that very rationally. They basically just told everybody outside of Sydney, "You're on your own," and --

(Laughter.)

-- what can I tell you? The bottom line is the Olympics were basically -- the majority of the Olympics were held in Sydney, and I'll show you a map of the park in a moment or two, but in New South Wales, there's six states in Australia, and the Olympics were held in four of those states. New South Wales is the home, you know -- again, when I first went down to Australia, I figured Sydney was the capital of the country. What the heck do I know? It turns out Canberra is, and Canberra is down there in the southern part of New South Wales.

But the majority of the Olympics were held 14 kilometers west of downtown Sydney, or the Sydney central business district. There were, however, events held in downtown Sydney in Darling Harbor, the marathon, the triathlon. The Convention Center in downtown Sydney was the host of the weight lifting, the boxing, and the Judo, and then all around New South Wales you had things like the shooting, the horse events, the equestrian events, and the baseball. Then east of Sydney on Bondi Beach you had beach volleyball. That's an Olympic event. Go figure.

(Laughter.)

If I can participate in it, it's not an Olympic event. I can tell you that much.

(Laughter.)

The actual site of the Olympics was a multi-acred facility, 14 miles east or west of the central business district, and that was Homebush. Fifteen different events occurred at Homebush. Kind of the crowning glory of Homebush was the Olympic stadium that held
about 110,000 people. And I give you some of this as background, but when you think about the threats of terrorism and you think about a village like this and you think about a stadium with 110,000 people, some of the natural concerns are obvious.

Let me give you a sense of what some of the threats were and some of the threat analysis that went on over the course of analyzing how to plan for the Olympics. First of all, the greatest threats were basically viewed as Homebush or the Olympic Village itself, as well as Darling Harbor where on any given day you could have four or 500,000 people wandering not just in the Olympic venues themselves, but because it's such a beautiful facility, wandering around the harbor itself. Two or three events, as well, were considered high threat kinds of targets. The first was the opening and closing ceremonies where you had significant numbers of people, and I'll show you that in a second or so.

Second was the fireworks that concluded the Olympics in downtown Sydney, and then finally the torch arriving in downtown Sydney the night before the opening ceremony. Clearly, the American and Israeli teams were considered high profile targets and extra security was involved in their movement. There were three family hotels in downtown Sydney that hosted what they called the Olympic family, which were many of the officials and relatives of the athletes which were considered softer targets because the level of security at those hotels did not come close to what it was at the Olympic venues themselves. And then clearly, the number of high profile visitors to the Olympics were considered targets. As you know from the United States, Chelsea Clinton and Secretary Shalala represented the United States and the official delegation. Chelsea was down there for about two and a half weeks.

Sydney itself is about three and a half million people. During the Olympics on an average day, there were about 400,000 additional people in downtown Sydney wandering around. Throughout the Olympics there were about 11,000 athletes, 50,000 volunteers, 5,000 officials, and 15,000 official media, but there were an additional 15,000 media that were not officially credentialed, and they tended to stay on the outskirts of the official venues. And then interestingly, and one of the challenges that they had, they had 13 or -- excuse me -- 12 cruise ships in the harbor that were used as hotels, and places like NBC brought people in. They stayed for four or five days on a cruise ship. That was their hotel, their convention center, and then they rotated other groups in and out of Sydney on these cruise ships. And one of the more significant incidents that we had that I'll talk about occurred on a cruise ship.

Just by way of numbers, when you look at some of the targets, when the torch arrived in downtown Sydney the night before the Olympics, there were an additional 400,000 people crowding the square outside of town hall. During the opening and closing ceremonies, there were 110,000 people in the stadium, plus another 120,000 people in various hospitality booths in Homebush itself. So on an average night during the closing and opening ceremonies, you had about 230 to 250,000 people in the Olympic Village. The closing ceremony though in downtown Sydney brought 1.5 million people to the downtown area itself.
And then an important thing to note is the City of Sydney had eight sites or six sites throughout Sydney that were not Olympic venues. These were big sites that you could put 60 or 70,000 people in. They had big screen TVs. They had bands, and they went 24 hours a day by and large. People could go in, watch events live on TV, and basically there was no security in any of these venues. In point of fact, one of the nights, they had to shut one of these venues down because crowds got out of control, and they had all kinds of problems with people climbing up on the TVs on lamp posts, and the venues had to be shut down as a result of the crowds. They expected about eight million people at these six live sites throughout the course of the Olympics.

I mentioned earlier the goal was to protect Sydney. When you looked at the other venues, and I mentioned Adelaide, Canberra, Brisbane, and Melbourne, basically there was no federal involvement in the planning other than some intelligence sharing. Sydney had predeployed teams. They had a host of equipment that was bought and predeployed. The only thing that Melbourne and Brisbane got was a push package made up of some antibiotics that came from the United States, as well as some personal protective equipment that came out of the military stockpile in Australia, and that was not allowed to be opened unless there was an actual event. And most of it was stored two to three hours outside the city at the nearest military base. So, for instance, if you need Mark One kits, which were part of the cache, and you needed them quickly, it was about a two hour mobilization to get it up there, and for those of you that, you know, have been involved in the planning for these events, that two hours is far too much when you're dealing with organophosphates.

So this was a big issue as we were working on Melbourne. Basically we had to buy everything on our own down in Melbourne. Brisbane had to do the same thing. All of the supplies had to be purchased on their own because they got little or no assistance from the national government.

The New South Wales Department of Health was responsible for dealing with bioterrorism, and in the State of New South Wales. In Brisbane it was Queensland Health. In Melbourne it was Victoria Health, and New South Wales had worked on this problem basically from 1994. As the Olympics approached, they put in place a number of plans, and I'm not going to go into a lot of detail because I don’t have the time right now, but you can take a look at these. They are available, and I'll tell you how you can get the plans. They looked at a number of the issues that could impact the Olympics, and it's important to note, and there's going to be a thread as I finish up in a few minutes, a lot of these had to do with things other than bioterrorism, but the planning that you used was very similar whether you were planning for a food outbreak or a bioterrorist event, and I'll talk about that as we get into surveillance because there were a lot of commonalities.

Clearly, the clandestine release of a biologic agent is a major concern, and certainly Tom Clancy’s book didn’t dampen their concern about it. I’m sure everybody has read Clancy’s book where they sprayed ebola or Marburg in the Olympic stadium in these
cooling systems. There were no cooling systems like that at the Olympic stadium, but Clancy did a good job on the book and got everyone's attention.

I must say that there was no specific threat information regarding bioterrorism in Australia. It was a concern. As many of you know, the Aum Shinrikyo did their initial work in western Australia. Their labs were in western Australia. So there was a high level of concern for biological terrorism, but there were no specific threats. They put in place a very comprehensive strategy that involved both prevention, detection, response, and communications.

First of all, prevention, and you know, this strategy seemed to have worked the best since we didn't have any incidents at the Olympics, but the intelligence and law enforcement played a very key role in insuring that there was good communications in tracking individuals, making sure they knew who was coming into the country, in monitoring any threats that occurred, and there were representatives from the FBI had a significant contingent of people down there. Other agencies from the United States were well represented in the intelligence and law enforcement cluster. They did do some things for prevention that were fairly simplistic, like restricting flights over Homebush. Surprisingly though, during major events in downtown Sydney, you could find six or eight helicopters flying over the city at any one point in time, and when you think about bioterrorism and you think about these planes that are trailing banners, they're ideal vehicles for disseminating agents, but there didn't seem to be a whole lot of concern about any restriction of these types of aircraft over the downtown venues. They had very tight entry security into all of the Olympic venues, but the focus was mostly bombs and guns. Surprisingly, you could walk into the Olympic Homebush Village with a bottle of fluid or liquid, and no challenge at all. You really got the sense that all they were looking for was either a bomb or a gun and nothing else. They had no training. They were not police officers doing the searches. Police officers were nearby at the magnetometers, but by and large, they were either volunteers or people that came from other agencies that wound up manning the entry points.

And finally, they felt as far as prevention they went out and very aggressively used public relations to let people know that security was going to be tight. They felt it would be a disincentive to people if they recognized how tight security would be. And they also let people know that they had good response plans in place, and they felt that that as well would be a disincentive.

Let me quickly go through some of the detection and environmental monitoring. First, you know, there are no real good environmental monitors that you can put in place. Amy will be talking about that today or tomorrow, but it’s a challenge that we continue to have. They used wet walled cyclone samplers, and they basically did samples inside the samplers, brought those to the lab two or three times a day to see if there were, in fact, anything in the environment that would pose a challenge. And then if, in fact, they had something that they found at a venue, they would use the hand held assays.
The heart and soul though of the whole Olympic monitoring system was a very sophisticated Olympic surveillance system that was put in place by the New South Wales Department of Health, and that involved a host of information that was coming in on a daily basis. Public Health Network, that was their normal reporting system. They just enhanced for the Olympics. They used information from WHO to look at what was going on throughout the world to see if anything out of the ordinary occurred in another country, to see if it cropped up in Australia. They did environmental monitoring, and then SOCOG had their own medical system within the fence of the village, the Olympic Committee, and that tracked very closely as well.

Every day they did briefings. They had a briefing every day at about two o'clock where they went through the data from the previous 24 hours to look at any patterns that might have shifted, any changes, any emerging patterns. They also looked at what was going on inside the fence, any patient contacts that occurred at the Olympic Village to see if there were any trends going on in patient contacts either with athletes or visitors.

And then they had public health investigation teams who were mobilized rapidly if they saw anything going on within the village.

I'm going to have to move quickly because I've got about four minutes left.

Finally, the Australian Defense Force had teams prepositioned at Homebush and Sydney in the event that they had either a chemical or a biological incident or a radiological incident. The ADF teams were very well trained. Several of the members came to the United States and Canada for a lot of their training and worked very closely with a lot of the agencies here. But they were ready to be mobilized in the event of any kind of an actual site specific incident, but they were not as involved if it was a clandestine release.

In addition, the fire department had medical response teams on site at various venues that they could mobilize, and then they also had additional physician support outside of Sydney that they could fly in in the event that they needed help real quickly.

And then I've already mentioned clandestine relief. New South Wales was the lead agency for managing the consequences of a clandestine release. It was theirs to own. It was something they would have to deal with because it was not a response. It was a public health emergency. They were supported by the Australian Defense Forces, and then the U.S. had significant stockpiles. Both Bob Knouss and Mike Anderson, who's here, were down there during the Olympics, served as a liaison to the Australian government, and then they worked close with Bayer Pharmaceuticals to ensure that they had additional pharmaceutical capability in the event that something happened. They had plans in place for augmenting hospital staffing in the event a major incident occurred through the New South Wales medical disaster plan, and surprisingly there was not a lot of emphasis on how they would do mass prophylaxis or mass vaccination in the event that that was needed.
Finally, communications. Communications was an important part of their response, and they actually had a communications plan. The most important thing that they wanted to get across in the event of an incident was that they spoke with one voice, that there not be conflicting information which would cause the public to lose confidence, and that's something that we continue to struggle with here in the United States.

Finally, let me just go through the incidents, and I'll finish up. Most of the incidents tend to be bomb related. Right before the Olympics, there was a package on the subway about two weeks before the Olympics that was detonated by the police department. It turned out to be a relatively amateur type of bomb. Many of you probably read about the nuclear reactor outside of Sydney near Homebush where they had found some people in Auckland, New Zealand, that were supposedly making plans to blow this up. It turned out to be a lot more media hype than it was substance. It really got a lot more play than there was reality.

One of the more interesting incidents we had was a stuffed animal that showed up at the airport that was X-rayed, and it had two vials of liquid stuffed inside of it, and as of the time I left Sydney, they were still analyzing it, but they didn't think it was any type of biologic agent. They were trying to figure out what kind of a chemical it is. More importantly, they were trying to figure out what it was doing inside of this stuffed animal.

They had a couple of major gas leaks at the airport. Most importantly, they had an outbreak. They had a couple deaths on one of the cruise ships, and it became a big deal in the media. I was reading Pro-MED every day down in Sydney, and on Pro-MED -- I mean, it was a big deal. You know, people are dying on these cruise ships. It turned out in all likelihood that it was the flu, and they had two crew members die. They originally thought it might have been Legionella. they ruled that out.

In summary, while bioterrorism was a concern, conventional weapons were still viewed as the greatest threat, but the health agencies took the threat very seriously and incorporated significant planning for bioterrorism in all their plans.

An important point. As they looked at surveillance, the surveillance system they put in place was not only good for bioterrorism, but it was good for monitoring food borne outbreaks, flu outbreaks, and any other kind of public health emergency that occurred. So these dual systems, when you think about surveillance for bioterrorism, you think about surveillance for any other emerging type of public health threat.

And finally, close links between the intelligence and public health communities were essential, and that's something that we need to continue to work on here in the United States.

And then one thing that we learned is special events like this are an excellent catalyst of enhancing and using it as a catalyst to enhance public health infrastructure and bridging the communications between the public health community and the medical community.
So with that in mind, I'm going to stop. I'll turn it over to Ed. I ran about four minutes over. I just wanted -- planning for the Olympics, Michael Hills and Dr. Michael Flynn and Dr. Jerry McNulty were the guys that really did the yeoman's work on this and deserve the credit for what went on down in Sydney.

With that I'll stop. I apologize for racing through it so quickly, but I've got a tough task master over here in Ed Eitze.

Thank you.

(Applause.)

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**Amy Smithson, PhD**

**International Cooperation to Prevent Biological Weapons Research and Development**

COL. EITZEN: Our next speaker I'm proud to introduce, Dr. Amy Smithson. Dr. Smithson is the Senior Associate at the Henry L. Stimson Center. Many of you probably may not know that when the U.S. first started getting in the biological warfare business back in 1943, the Secretary of War at that time was Henry Stimson, and the center that Amy works at is named after Mr. Stimson. The Stimson Center conducts analytical research across the spectrum of complex topics associated with the threats of biological and chemical terrorism. Dr. Smithson has served as a consultant to both government and media. She has a PhD in political science from G.W.U. and an M.A. in international relations from Georgetown University. She has many publications. The two most recent notable publications, well known to many of us, are entitled -- the first is Ataxia, the Chemical and Biological Terrorism Threat and the U.S. Response, and that one has been mentioned in the media a great deal recently, and more appropriate to her talk today, a publication from December of 1999 called Toxic Archipelago, Preventing Proliferation from the Former Soviet Chemical and Biological Weapons Complexes. Dr. Smithson will speak to us today on "International Cooperation to Prevent Biological Weapons Research and Development." Please join me in giving a warm welcome to Dr. Amy Smithson.

(Applause.)

DR SMITHSON: Thank you, Colonel Eitzen, for that gracious introduction and also thank you to Dr. O'Toole and her colleagues for asking me to be here with you today. As he noted, my presentation is based on a publication from about a year ago, and it addresses a very important proliferation problem and the programs that are meant to resolve that problem if that is, indeed, possible. The report was based on interviews with dozens of former chemical and biological weaponists in the former Soviet Union, as
well as interviews with U.S., European, and Russian officials working in what are known as brain drain proliferation efforts.

To set a little bit of context here for the nature of the proliferation threat, when Americans think about proliferation problems in the former USSR, what they’re most likely to think about is what are known as “loose nukes” and that problem. I’m going to talk today about the more human context. And these figures denote the size of the scientific communities working on nuclear, chemical, and biological weapons in the former Soviet Union, and as you can see, the size of the total number of weaponeers is roughly comparative in the nuclear and biological fields. Try as I might, I could not get anyone to give me an exact number of chemical weaponeers. So the figure there is really a rough estimate.

The other column denotes the number of weaponeers that the U.S. government deems to be a critical proliferation risk should they sell their expertise or perhaps weapons materiels to other governments or to terrorist organizations. And what is of interest here is the fact that the number of nuclear weaponeers is much smaller than the number of critical chemical weaponeers and is much, much smaller than the number of critical biological weaponeers that would pose that type of a threat.

This map depicts what I dubbed the "Toxic Archipelago," and this is a string of facilities scattered across eight different countries these days since the Soviet Union collapsed, and for those who are unfamiliar with the astounding achievements of the former Soviet biological warfare program, let me give you a thumbnail sketch. There were over 50 nominally civilian institutes involved in the research, development, testing and production of biological weapons. In addition, there are four military institutes that no outsider has ever set foot in. Only the Russians have been in there to date.

The Soviet conducted research with over 50 diseases for military purposes, weaponizing several of them, including tularemia and Marburg. They also produced tons of anthrax, plague, and smallpox, and loaded these agents on top of ballistic missiles aimed at Western civilian population centers. Some of their agents they made antibiotic resistant, and according to the former Deputy Director of Bio Preparat, Ken Alibek, they were also conducting research into chimera agents that would marry two diseases to create a super bug. We simply don't know how far they got in this regard. In addition -- let's be kind to our fine feathered friends.

(Laughter.)

DR. SMITHSON: Hey, I'm all for a good laugh. In addition, they had 10,000 scientists alone working on anti-crop and anti-livestock agents. So there's a thumbnail sketch of the "Toxic Archipelago." When the Soviet Union collapsed, the seven governments that also inherited these facilities were largely unaware of what they had on their hands. These were top secret facilities, and so they were unprepared to incorporate them or the scientists that were employed there into the civilian economy.
In addition, although Yeltsen stepped up in 1992 and gave the mea culpa that the Soviet Union had violated the biological and toxin weapons convention, he also decreed that the offensive weapons program would be shut down. Unfortunately, his decrees have been implemented unevenly largely because a number of the individuals who ran these offensive weapon programs are still in their jobs, in the ministries that oversee these institutes, and in the institutes themselves.

Now, the scientists that I spoke with by and large wanted out of the biological weapons business. They wanted out of it badly. They didn't want to be in it to begin with, but a number of these senior aparatcheks certainly do not share that view. When the Soviet Union collapsed, so did the funding for the weapons institutes, and it was not uncommon for me to interview scientists whose institute was receiving only five percent of the funding that at one time they had received from Moscow. They're having a hard time keeping the lights on, and in the Moscow and Russian winters, which are rather rigorous, they weren't even working in heated laboratories. In 1995, it was not uncommon to find senior scientists being paid at a level of 25 to $50 per month. I even interviewed scientists who had been paid less than a dollar a month.

Now, in 1999, according to the World Bank, the poverty level in Russia was $37 per person needing food and clothing. You can do the calculation yourself. A lot of people -- and this is the way that people being paid who were fortunate enough to keep their jobs. Scientists at these institutes were laid off by the thousands. And last year, for those who had managed to stay on the payroll, their pay was sporadic.

Certainly there were those in Washington who recognized that this presented a proliferation problem, and thanks largely to Senators Nunn and Lugar and the cooperative reduction program, there were some initiatives that were begun to try to get cooperative grant assistance to these scientists so that they would be able to resist the offers from governments or from terrorist groups that we know have come their way. What this rather spaghetti-like chart shows is the funding for four collaborative grant programs. One is the cooperative threat reduction money which goes to the Department of Defense and works through the International Science and Technology Center, and the Civilian Research and Development Foundation to fund collaborative research grants. A second funding stream is the Freedom Support Act, which passes through the State Department on its way to the International Science and Technology Center in Moscow and its sister organization in the Ukraine. And the third funding stream is through the Department of Energy's initiatives for proliferation prevention, and, yes, I do see the bird flying around now.

(Laughter.)

DR. SMITHSON: The International Science and Technology Center is the largest of the four grant research programs, and it is also funded by the European Union and a few other countries. What this chart shows is a comparison of the number of projects being funded in different disciplines. The top bar shows the number of projects across all four
of these research grant programs which total just over 1,700 projects. The very small slice that you see below it are the number of projects funded in the area of chemistry, under 70. The slightly larger slide below that is the number of projects funded in the field of biology, which is just over 300 out of those 1,700 projects from 1994 to 1998.

Now, the caveat that I’d like to put on this is that some of the chemical and biological weaponeers are being reached under other discipline areas, grants in those areas such as environmental research. But by and large, it’s pretty easy to see that there is a skew in the funding that does not favor getting research grant assistance to the chemical and biological weaponeers. In addition, there was a slight rise in funding in 1998 and 1999 aimed at the biological weaponeers in the former Soviet Union.

Now, they've been making headway with these grants, but when a research grant is given to these scientists, you have to recognize that they're truly starting from scratch. These are people who don't know how to manage grants, who do not know how to take their science from the laboratory to the commercial marketplace, and they have to be taught business practices. They also have to be taught things that many of us take for granted, like intellectual property rights and Western standards of animal care so that their research can apply in Western markets. And in addition to giving them research grants, these programs are providing this critical training. Some of the research institutes where I interviewed scientists have begun to spin off for profit companies, and they are beginning to produce some products for the domestic market, but they're not really making that much money on this yet because the economy there is depressed and because this is a real novel adventure for most of the scientists involved. Some patents are being applied for. so it's possible to see that the seeds of transformation of these institutes from places that made weapons of war to centers of peaceful research and commercial expertise has begun, but certainly there's a long way to go.

Now, out of my research, I came to four basic conclusions. One is that the programs that are allotting these grants could certainly do it on a faster timetable. I interviewed scientists that had waited over two years to hear whether or not their application for a research grant had been approved. Now, it's pretty tough to feed a family on a dollar a month or $25 a month if that's what you're getting. So I think they should speed that up in the governments that are reviewing these grant applications. In addition, it's abundantly clear that the Putin government needs to take this issue in hand and lay off or fire the people who used to run the offensive weapons programs and are in many ways thwarting the efforts to reach these scientists and give them assistance.

If you'll recall the spaghetti-like chart, it's also pretty clear that the U.S. government could be better organized to address this problem. And finally, a point that I'd like to elaborate on a little bit more is that the funding for these weapons scientists needs to be increased.

Now, from the 1994 to 1999 time period, the United States government provided, on average, $3.5 million for biological grants. I want to say that number again: 3.5 million. That's a small number in the scheme of the rhetoric that has come out of this town about
the severity of the biological weapons proliferation threat and the possibility that these scientists have to exponentially help other countries or terrorist organizations in acquiring these weapons.

Now, at the Stimson Center, we did a calculation on how much would be needed to actually reach just the critical weaponeers, and that's the conservative number there, the conservative estimate, and a minimum increase in funding to these programs would be $12.6 million per year. Now, in case you're wondering how that figures into the Pentagon's budget of over $260 billion this year, it's a number so small I don't even know how to say it so I'll just read it: 0.0046 percent of the U.S. defense budget is all that I'm asking for, and I don't think that's too much, given the severity of the threat that these scientists represent if they are unable to support their families and to resist the offers that are coming at them from places like Iran, China, North Korea, and Iraq. And, yes, I did interview scientists who knew colleagues who had gone to these places to teach.

So I would argue that much, much more needs to be done in this regard and remind you that this is like turning a super tanker. The radius for turning a super tanker is miles, and we've just begun to convert these facilities. This is a battle that's going to be fought institute by institute and literally scientist by scientist. And in comparison to defense programs, and I'm all for defense programs, it's relatively cheap to address the proliferation problem at its source.

A couple of figures to keep in mind in that regard. The U.S. anthrax vaccination program for our soldiers, price tag, roughly $130 million for over six years, and that's just to vaccinate them against one threat agent. Price tag for research, development, testing and deployment of new gas mask for our air crews and ground crews, 838 million bucks, and I'm just asking for 12 million to get just to the critical weaponeers.

I would argue that this money is a counter proliferation and counterterrorism bargain and also ask you to think about the fact that we really need these people to explain to us what they've done in order for our defenses to be as strong as they can be. There's a lot of uncertainty about just what they have accomplished in their program.

In addition, I would ask you to imagine what it would be like if we could get all of these weaponeers working on cures instead of diseases and weapons of war. So let's put a little bit more funds in this. It's not much.

And for those of you who are interested in looking at the research in a little bit more detail, the whole report is up on our website, and the address is there for you to take down if you'd like it. The report that Colonel Eitzen mentioned, Ataxia, is also up on the website in its entirety, although my colleague and co-author, Leslie Ann Levy, is here if she can wave her hand. If you find Leslie Ann or Claudia McCarthy, who also works with me in the project, you may be able to sweet talk them out of a disk copy of Ataxia so that you don't break your back when you hit the printer button.
Thank you.

(Applause.)

COL. EITZEN: I wanted to mention that there was no extra charge for the arranged animal entertainment as part of this panel. Such an extra charge might be perceived as the organizers trying to feather their nests. So --

(Laughter.)

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Martin Hugh-Jones, DVM, PhD

Global Awareness of Disease Outbreaks: The Experience of Pro-MED

DR. HENDERSON: The next presentation will be by Dr. Martin Hugh-Jones, Professor of Epidemiology at the School of Veterinary Medicine at Louisiana State University. He has served as chairman of the WHO Working Group on Anthrax and Director of WHO's Collaborating Center for references and training in remote sensing and geographical information systems for veterinary public health. He's been a moderator for Pro-MED, the voluntary, Internet based, global disease reporting system that has proved so successful and which so many of us rely on.

He was also one of the team that investigated Sverlosk anthrax epidemic. He will speak on the "Global Awareness of Disease Outbreaks: The Experience of Pro-MED."

DR. HUGH-JONES: It's a pleasure to be here. I remind you of an event that happened about 120 years ago when they built the Crystal Palace just outside London and Duke of Wellington who was responsible was taking Queen Victoria around, and she noticed all of the sparrows trapped inside the glass, and she said, "How are you going to get rid of them?" And he said, "With sparrow hawks, ma'am."

(Laughter.)

Pro-MED came about as a result of a seminal publication by Institute of Medicine in 1922 on emerging diseases, and from that followed various discussions in Geneva, and then Jack Woodall, who had been working in Geneva and had been there during the Kuwait troubles and was responsible there for the BW response, took it to himself and gathered his friends around him, and in August the 22nd, 1994, the first notification went out on Sabia (phonetic) and other viruses. It covers human, animal, and plant diseases. It is non-governmental. It is open to any and everybody. You don't need a password. You just need to sign up so the computer knows where you are, and it is moderated. And one of the interesting things that we noticed with some amusement on the inside is the catalyst that it has had on a number of organizations who are now
turning out their own rapid response E-mail, electronic newsletters and whatever. I won't name them. They've already advertised themselves already today. We still say we're faster than they are, but that's -- you know.

We do deal with emerging diseases, and as far as human beings go, it is realized that most of these are going to come through the animal world, and in 1999, for example, 63 percent of all postings involved animal diseases and zoonotic diseases. So that veterinary armor that is exceptionally important, and I was asked to join -- I can't remember exactly when; about '95 -- Jack and I were at Cambridge together, and he dissected mice on the second floor. I was dissecting horses in the basement, and I took on the veterinary side as a sort of probationer, and I found it very interesting. In the first two years it took that long for the medical fraternity to realize what the contribution was from the animal side. But now it's such that when I go to a meeting and I hear people talking about Pro-MED, the physicians start lecturing me about animal diseases, and I love every minute of it.

(Laughter.)

It was originally funded by the Federation of American Scientists, and we utilized satellites. That worked fine, but the satellite system that Satellite was using was well over age. There were all sorts of funding problems. The new satellites, there was uncertainty about band width and availability, and fortunately in the midst of a great deal of worry in 1999, we were acquired by the International Society for Infectious Diseases, which comes out of Harvard, and Oracle jumped in with some money and software, and we have the Rockefeller Foundation, the Harvard School of Public Health, and we are negotiating with Mr. Gates for some longer term funding. But it is a real problem to keep it going.

And as of last year, we had 20,000 members in 160,000 countries. There's a hit rate on the website alone of 10,000 a month. I'm still amazed by the number of people who read it every morning like their newspaper, and it seems to work very well. It's a typical British, amateur effort which has worked, and this was the distribution of the membership as of the end of last year. You'll see the weighting in North America and the Antipodes. Europe was slow getting into electronic communications, but they've caught up. Unfortunately the places that we really need membership, as in central and west Africa, and the -stans are still shy, and we need to get more people from there. The way it works is that we have a number of systems for scanning newspapers, reports, encouraging people to get it in. There's a collection of sheepdogs out there, as you might say.

This comes into the editor who then sorts it out to whichever moderators are on duty at that time or have special interest. They sort it. Maybe they'll ask for more background information, and it may go out for further information. I will admit when I was a moderator working all the time, I used blackmail frequently. It works wonders. The moderators are here, and I'll just go through this rather slowly because one of the things we've had is risk communication. People do not trust
governments mainly because governments prefer to have news about the minister opening a new clinic and not about a disease problem, and opening a new clinic is not news anywhere.

And knowledgeable sources are trusted, and when there's trust, it reflects back in the assumption of knowledge, and through the moderators and through the membership, who is actively involved -- and we really do work hard to identify people in the membership who will be called upon to comment or come up with additional information. It really helps, and I think this has been much to our advantage -- and accountability is important.

Every piece of information that goes out has a brand line at the bottom, and you can see who's worked on it, who's edited it, whose hands it's gone through, and if a mistake is made, we know exactly where it happened.

And I cannot emphasize too much the need for transparency by agencies in providing information. This engenders respect in your way. We've had problems of claims of unreliability. We work on the cusp. We are collecting information largely from journalists. We've already had comments about journalists. They frequently put out bad information because they're not provided with good information. If you give them a press release, they're lazy guys. They'll copy it out and get it straight out, but if they're having to be briefed by voice, they'll write down the wrong things, and then there's a lot of catch-up that has to go on.

We did an analysis at the end of -- no, beginning of this year on mistakes, and we found that in going back over our records that 1.7 percent of official reports were retracted, and 2.6 percent of newspaper reports from members were incorrect. So the error rate is somewhere around four-plus percent, which considering the speed with which we get material out and the fact that everyone is doing this on top of all their other work, I reckon it's not too bad. I wish it were better, but when I was moderator early on, it took two-thirds of my day just doing all of the housekeeping, and Tam Garland has taken over me. It takes four hours out of her day. Plus she has a job as well.

There are few graphics at the moment. This is on purpose so that it can be loaded anywhere. This is an inheritance from Satellite where that was going to clinics in Africa and Asia, and these were modest computer systems, and we couldn’t overload them. There are search engines for prior postings, and there's how it works. This is what the website looks like. This was early October, which had the number of postings for that day. You just click on it, and this is for Rift, and then the report comes up with all of the prior postings.

Something I had to learn was moderation. I'm an experienced epidemiologist. I've worked on a whole range of diseases. When I read a report, I'm far more interested in the mistakes in the report than by the knowledge because I know how the epidemiology works. So from the mistakes, I can see how they are handling or mishandling it. So I had to learn how to comment, and there's also the comment by Pelagius, who said that people won't think unless you add labels, except he did it a bit more rudely than that, and you have to add labels so people can see where the important parts are from the less
important parts are, and specialists tend to be very narrow in their knowledge, and outside their area of interest, they'll frequently know absolutely nothing, and you have to walk them through it and have to provide reliability. Do we trust this report? Do we not trust it or is it so-so until we can get something better, which is why I frequently was involved in blackmail?

I'd send a copy to the Chief Veterinary Officer saying, "Victoria, say we have this report ready to go out. If I don't hear from your people in 18 hours, it's going out," and I'd do it. And they quickly learned to respond quickly, and the CBO from Australia, I worked closely with a member of his staff, and in six months we got him so quick off the mark it's just been marvelous ever since.

(Laughter.)

And you have to encourage these government people to be proactive with their news. People learn that if you get it out first, you are then in charge of that news string. Everyone then is listening to you, and you are seen to be the authority. If the journalists get out first, you aren't. So get it out first. And obviously we have fights inside which you don't wish to know about, but we're continually arguing over what should go out and why did you cut this and why, et cetera. It is a matter of development.

Another aspect is we get misinformation, which we identified that was funny, and then there was Prairie Dog, and then there was a Hollywood Nutta (phonetic), and then we have disseminated advancing disinformation, and we're quite good at catching them. Now, I want to take you on to something that happened in May of this year, May and June, from Per Lausund, who is a senior veterinarian with the Norwegian military. To say that they're picked up, this addict who had died of anthrax and immediately I knew something was wrong. What you see here is the edited version of what went out. This is a shorter version, a rather pianissimo version.

And so whilst I was trying to work out what to say, because thinking about advising on terrorist events as they happen when you're faced with it, it's another matter altogether. So I was informing people in the Surgeon General's office, the FBI, the other alphabet soup, FAO, WHO, and key other people that I knew. I was trying in my own mind to work out what to say so as not to give advice to every wooly headed survivalist who would think it was right to kill a drug addict, and it's religiously correct, is it not, I mean? And so this was my comment on the back. There's a certain amount of red herring in there, but I was told by a good journalist friend of mine who when she read this she understood everything that I was getting at, and a colleague of mine who's responsible for security in the Bronx, he had all of his people warned. Down in Louisiana, we had a prostitute that had died of an overdose, and she was wheeled straight back into autopsy to check. It worked. Those who needed to know could read what I was getting at. We then had confirmation a few days later that it really was anthrax, and just at this same time, I read the BBC. I read a lot of newspapers on the web. We came up with this report of an addict dying in Glasgow, and I thought they must be related, you know.
So one of the advantages of being a moderator with Pro-MED, when you make a call to some public health officer in in this case Glasgow, they pick up the phone and talk to you. My students believe I know everybody in the world. It's not quite true, but a hell of a lot of people know me and return my calls, and in that way we were able to find out and keep in touch with the people in Glasgow as that problem developed. As they checked out anthrax, there was a problem over some misreading of some serology and where the samples actually went to, and in due course it turned out to be a clostridium novia (phonetic) infection, which I grinned to myself because when I was a veterinary student working in the investigation laboratory in Redding we had the place full of sheep, ewes, dead from this every spring, and as a vet, we see clostridium novia all the time, every spring certainly, but it had gone into a human hospital, and it took them a little bit longer to discover it. Now, novia got into that heroine has not been revealed. I don't think anybody knows. A team from CDC was sent over to help out, and they had a number of units set up in the U.K., and in due course virtually all of the cases were brought together, traced back, batch watched, and it came together nicely.

And it turned out not to be -- what happened in Oslo we still don't understand. The Norwegians have gone very quiet on that, but everybody paid attention. It came together well. This large problem in the U.K. was worked out. We got everybody up who should have known in this country and in some other places as well, and a lot more information happened that we wouldn't have got otherwise. It worked. Thank God, it wasn't a massive, great terrorist event. I was very glad about that, and this was the total part of the epidemic. In the different parts of the U.K. they faded out.

I saw in the BBC the other day that the Estonians had done a crafty bit of work and working with the Scottish police, they set a trap, and they caught a Scottish drug trafficker in picking up heroine in Estonia. So it is probably that is where that part came from. It casts a long shadow. It worked this time. It was enjoyable, and one of the things I must admit is that moderating Pro-MED is fun. It's hard work, but it is enjoyable, and when Tam was taking over my job, I said, "Do you really want to do it? It's going to eat up your day and every day you're going to make mistakes, and once a week, you're going to make a global fool of yourself."

(Laughter.)

And she, bless her heart has taken over for me, and she does a super job. We do need people. The members make it work because when we get something in, we can then send supplemental messages out to people who have identified themselves as willing to comment and have shown reliability in their commentary, and they'd get it, and then they get back to us. I sometimes get somebody who says, "You've made a fool of it, Martin. Why didn't you get in touch with me?" And I say, "Well, why didn't you put your hand up at the beginning and we'd have added you to our list of volunteers?"

So if you think we make a mistake, send us a message, and we'll just add you to our list of volunteers to read stuff early and make sure it's right, or you join us in being accused of getting everything wrong yet again.
Thank you very much.
(Applause.)

Marcelle Layton, MD, MPH

Outbreak Surveillance and Management at the State and Local Level: Current Realities

DR. HENDERSON: Our last speaker in this group is Dr. Marcie Layton, who is the Director of Communicable Diseases of the New York City Department of Health, and like it or not, a national expert on West Nile virus disease.

(Laughter.)

In addition to her concerns with West Nile, she is also responsible for all other infectious disease activities in the city and for disaster planning for the threat of bioterrorism. She's a medical graduate of Duke University with clinical and epidemiological training in infectious diseases at Syracuse, Yale, and CDC, and she will speak on the realities of outbreak surveillance and management at the state and local level. Marcelle.

(Applause.)

DR. LAYTON: Thanks. As was pointed out earlier, the technology gap exists at our local health department level, and to prove that point, I’ve been told that I’m the first speaker to use Kodachromes as opposed to Power Point. So on that note, can I have the first slide?

I've been impressed at how many times West Nile has come up this morning. I was last told about ten times it's been mentioned with respect to bioterrorism preparedness, and what I'm going to try and do over the next 20 minutes is rapidly overview our recognition and response to the West Nile outbreak in New York City last summer, and although it was a big story, it was actually a relatively small outbreak, and it doesn't address all of the issues that would arise during bioterrorism. But I do think that there are some lessons to be learned with respect to how our existing public health infrastructure can be strengthened to improve our nation's response for bioterrorism.

Just to give you some background, viral meningitis and encephalitis are two of 70 reportable conditions in New York City and New York State, but unlike many of the diseases that we track, the diagnosis is primarily clinical based on a characteristic syndrome of signs and symptoms and often not a positive laboratory test because full viral laboratory testing is not done. Because of that we're very dependent on physician reporting, and unfortunately, like many areas of the country, physician reporting is
incomplete. In New York City we averaged about nine cases of encephalitis per year prior to this outbreak and 170 of viral meningitis.

We recognize that data is not complete, but despite those limitations, there is some value to looking at our historical data. It's hard for me to see, but every year in August and September, we do see a seasonal peak primarily in viral meningitis. This is primarily occurring among young children, and when there is a diagnosis, it's primarily enteroviruses, a family of viruses that's transmitted person to person through infected stool. So when this outbreak was first detected last summer, that's what we expected it to be, common things being common. The other thing to notice on this slide is the 1999 data, which was our provisional data that was in the database the day the outbreak was first recognized, and I show this just to make the point that based on routine surveillance data alone, there really was no indication that anything unusual was going on in New York City based on historical trends.

At the city Health Department over the past several years we’ve been actively promoting the importance of physician reporting of unusual disease clusters or manifestations, both because of our concerns about emerging infectious diseases, but also because of our concerns about bioterrorism. And there’s really no better example of how powerful a single physician's report can be than this particular outbreak. I was actually the one on the receiving end of this phone call last August 23rd, a day I'll never forget, when I was contacted by Dr. Debbie Asmis, an infectious disease physician in northern Queens, who was concerned about two patients that she was seeing both of whom she thought probably had viral encephalitis, but one of them more than the other had severe muscle weakness associated with their presentation. And she was also concerned about botulism, and the neurologist seeing the case was also concerned about the possibility of Guillain-Barré.

She presented the cases to me, and for a number of reasons, I did not think these patients had botulism, did not recommend botulism testing, but encouraged her to send spinal fluid and sera up to our state health department lab for viral testing. We sent staff out to review these charts and kept in contact with her, and on August 27th, she called again because she actually only had a third case at this point, but all three cases had developed, in addition to the viral encephalitis symptoms, severe muscle weakness, and while I was talking to her on the phone, the neurologist at the hospital just happened to walk in, heard that she was talking to the health department, and mentioned that he was seeing a very similar case at a nearby community hospital.

So when I got off the phone, that phone call, I had four cases of an unusual encephalitis, when normally I only see nine cases city-wide in a year. So by definition, this required an outbreak investigation. This was more than expected, and it is usually my bad luck at the Health Department. August 27th was a Friday, and this phone call came around 4:30 in the afternoon. So a colleague of mine and myself spent the weekend at these two community hospitals, and through some active case finding, by Sunday morning had identified eight suspect cases, all in the same community.
Just to give you a sense of my initial concern and why it concerned us, these were all relatively healthy, older adults living at home in a small area of the city, a 16 square mile area of northern Queens, and their clinical presentations were basically identical. They all had a febrile illness associated with some mild GI symptoms, followed by the onset of altered mental status, and seven of the eight had this very severe, diffuse muscle weakness to the point of paralysis in over half of the patients, and it was that unusual characteristic that concerned us the most because it didn't really fit any known viral cause of encephalitis. And the laboratory parameters were very suggestive of an infectious and specifically a viral etiology as opposed to a bacteria.

For those who don't know New York City, this is the White Stone Peninsula of northern Queens, the same area blown up closer to me, and it just shows how close these patients lived to each other. None of them lived more than a mile or two from each other.

That weekend at the hospital, we played medical detective, interviewing these patients' families extensively to try and figure out what they had in common, if they had been in the same place at the same time or if they had any common associations. The first thing we were able to tell is that these patients did not know each other prior to this hospitalization, and then no matter what we asked, we really couldn't find any common links. They had not traveled anywhere in common, had not attended a common social event, eaten at the same restaurant or shopped at the same store.

As I mentioned, enteroviruses are what we'd expect to be in New York City at this time of year. Those are viruses that are transmitted person to person, and we were struck by the absence of any secondary illness among these patients' immediate household and social circle, and also since enteroviruses are carried by children in any community, that none of these patients had had recent contact with young children.

The only thing we could find in common was that all of these patients when we asked how they spent their days in the week or two before illness reportedly spent time outdoors in their backyards in their neighborhoods, especially in the evening hours doing things like gardening or smoking on their porch deck.

Well, that first week of the investigation was the most difficult and as far as raising acid levels in our stomach because we really weren't sure of what was going on. And similar to what we do for many outbreaks, our first step was notifying those who knew more than we did, and that Sunday morning, we actually notified both the arboviral and the enteroviral experts at CDC to get expert opinions.

We also notified our neighboring public health agencies to see if anyone was seeing similar cases, and they were not. Everyone we talked to agreed with us that the most important thing was getting a diagnosis. The same would be true for a suspect bioterrorist event. We really can't make public health or medical recommendations until we have a specific diagnosis.
So we continued to prioritize, obtaining spinal fluid and sera and sending it to our state health department lab for viral testing. We also began much more active surveillance city-wide by alerting the New York City medical community both by broadcast fax and E-mail. That was passive on our part. We just described this initial cluster and asked physicians to call us if they were seeing similar cases in other parts of the city because we were concerned that although the outbreak was recognized in northern Queens, that's only because one physician just happened to call from that part of town. And because we didn't want to completely trust physicians to call us, we also began very active surveillance by having our staff call infectious disease and neurology doctors at the 70 hospitals in New York City to see if anyone else was seeing similar cases.

And as this week unfolded, we were actually up to about 30 suspect cases by the end of the week, and because the other calls of encephalitis that tends to occur in outbreaks in the summertime are arboviruses or mosquito borne viruses, we did send an entomology team -- we actually had to borrow an entomologist from the Museum of Natural History because we didn't have one on staff at the time. We've since hired her -- but --

(Laughter.)

-- we used her and our staff to assess the area for potential mosquito breeding sites around where each of these patients lived, and it was the evening that this team came back and reported their findings that we became much more convinced that we were dealing with an arbovirus because patient after patient, they described something very concerning in the area around where each of these patients lived, whether it was a pile of old tires or a partially excavated swimming pool.

Well, our suspicions were first confirmed actually on September 2nd, when we got a preliminary report from our state health department lab that an antibody test in their lab was most consistent with what at the time was thought to be St. Louis encephalitis. We did not go public that day because we wanted to wait for CDC confirmation, but we used those 24 hours to develop contingency plans for mosquito control in the event that CDC confirmed it, which they did on September 3rd at two o'clock in the afternoon, and again, my bad luck. September 3rd was the Friday before Labor Day weekend. So I was very glad for that 24 hours to be able to mobilize a response. It would have been very difficult for us to do at the start of a three-day holiday weekend, and we were able to implement mosquito control in northern Queens over Labor Day weekend.

We continued active surveillance, had our first positive case in Brooklyn less than a week later, and it was that case, along with numerous suspect cases throughout the city that led to the unprecedented decision to begin mosquito control city-wide.

The identification of a human outbreak of encephalitis in the late summer requires, the public health response requires rapid mobilization of mosquito control measures. This was a public health emergency, and similar to other public health emergencies required a great deal of ongoing communication and coordination between a large number of
agencies at the local, state, and federal level. This was done both by group E-mails and conference calls.

New York City, as I mentioned, did not have an existing mosquito surveillance and control program. So it required us to pull together emergency contracts for mosquito surveillance and control. We also got a chance to practice our plans at least on a small scale for mass prophylaxis. Jerry Hauer purchased 400,000 cans of mosquito repellent, and we distributed them free of charge through various city venues because we were concerned about a run on city pharmacies when those headlines hit.

The biggest challenge was public health education. It's always going to be the biggest challenge. This was easiest that first weekend when the outbreak was localized to one small part of town. We were able to focus our efforts in northern Queens and actually send health department staff, hundreds of them, door to door with information sheets translated into eight different languages about the virus itself, the mosquito control protective measures that were needed, and also address concerns about the pesticides. But when we went city-wide, we really needed to rely on a public hot line. That was stationed at our Office of Emergency Management, but staffed by the health department 24 hours a day, ran for almost seven weeks, received 150,000 calls during that time, was the busiest hot line the city has ever set up, and in setting this up actually at its peak, we had 75 staff there per shift, including physicians and toxicologists as back-up, required a great deal of training of staff and oversight to maintain that.

Obviously there was a need to communicate and coordinate with the media. We did this through daily press conferences. They were almost always attended by Mayor Guiliani and our Commissioners of Emergency Management and Health.

And then similar to a bioterrorist event, there was a need to have direct communication between us as a public health agency and the medical community, to be providing more specific medical information, and we continued to use our broadcast fax and E-mail system that goes to several different offices in each hospital, and also set up a separate hot line for providers.

There also was a need to coordinate with a number of agencies. This is our Department of Sanitation helping to clean up a tire pile. We worked with our police department using their helicopters to map an amazing number of backyard swimming pools that existed in this part of the city, many of which had not been well maintained because of the drought that occurred last summer or two summers ago, and we would identify these by air and then send health department sanitarians door to door to clean them up, and this is just one of the many deep distribution centers that was set up with EMS.

Well, what was already unexpected, having SLE in your city, became unprecedented with the recognition of West Nile, and the recognition of West Nile was primarily due to the recognition that there was a simultaneous bird die off, and, no, this bird flying around isn’t a prop that I brought for my talk, but it primarily last year and this year affected crows, and that this outbreak or epizootic was due to the same virus. And it's
really thanks to the veterinary pathologists who recognized that these birds were also dying of encephalitis and sent these tissues for viral testing, leading to the recognition of West Nile as the cause of both the human and avian outbreaks.

There are a number of reasons for the delayed recognition of West Nile, and I'm not going to go into detail about them. Partly the cross-reactivity among these, this close cousins of West Nile and St. Louis, which I'm very grateful for, and also the difficulty that neither CDC nor the state were ever able to culture the virus from human specimens. But the biggest error in retrospect is that the bird die off was initially felt to be unrelated since arboviruses do not normally kill birds. It's their natural reservoir host. It was unprecedented to have either West Nile or SLE cause simultaneous outbreaks of human and avian disease.

Similar to what we would need to do for a bioterrorist event, our response, once we identified the cause, was to define the geography of the outbreak and also to continue active surveillance to evaluate the need for control measures. In New York City, we implemented a multi-faceted surveillance program with respect to human surveillance. We did both passive and active surveillance, passive surveillance through those almost weekly fax and E-mail updates that we sent to the city medical community that updated them on what was going on with the outbreak, but also reminded them out to report and not to send specimens to us for testing.

We continued to do active surveillance, actually expanded it during the peak of the outbreak, and had our staff calling nine different specialists in each of our 70 hospitals, adult and pediatric, general wards, infectious disease, neurology and intensive care, to make sure that we were hearing about every case.

We also had two back-up systems, a laboratory based system where we collected spinal fluid and also a retrospective system collecting hospital discharge data to be sure that we picked up cases that might not be reported by clinicians. And our environmental staff at the same time needed to implement both mosquito and bird surveillance systems.

We tried to provide physicians with clear criteria for reporting. Obviously the same thing would be needed for bioterrorism. For West Nile, we emphasized that a syndrome of the initial Queens cluster encephalitis was severe muscle weakness; also looked for any case of encephalitis, fever with paralysis, or the milder syndrome of viral meningitis.

This slide shows, as is always true with active surveillance, that you always pick up more cases than you do passively. Actually during the three months of this investigation, we picked up three times as many cases as we normally hear about in a year. Each suspect case needed to be evaluated and prioritized for laboratory testing, and then similar to what we would do for a bioterrorist event, all positive cases were interviewed to determine potential sites of exposure. Last year's outbreak, there were 62 cases primarily in the New York area, and there were seven deaths, and we actually worked closely with our Medical Examiner's Office to insure autopsies in all cases. I can't see
how well that slide shows, but this just shows that the human outbreak was most intense in the area of the city where it was first recognized in northern Queens.

And as I mentioned, the avian outbreak was much larger than the human outbreak, actually extended into both New Jersey and Connecticut, and there was a horse outbreak in eastern Long Island that was not recognized as being due to West Nile until some time in October. Well, everyone involved in last year's outbreak agrees that this represented a natural introduction of a virus into New York City, with the most likely explanations being that an infected bird, infected human, or possibly infected mosquitoes themselves traveled probably by airplane or potentially by ship.

However, the possibility of bioterrorism needed to be considered. It would have been negligent and also naive of us not to consider bioterrorism, as there were characteristics of this outbreak that met the criteria which should always prompt public health authorities to think bioterrorism. This was a cluster of unexplained serious illness with unusual manifestations, that severe muscle weakness that had not been reported before for either St. Louis or West Nile as a predominant feature. Initially there was no obvious common exposure. It was an unusual location for an arboviral outbreak. We had not had an arbovirus in New York City in over 100 years, since the yellow fever epidemics back in the 1800s, and there was also a simultaneous bird outbreak.

Although none of us involved, again, think that this was bioterrorism, the outbreak itself and our response raised some concerns regarding the implications for our nation’s preparedness for bioterrorism, and in New York City, there’s no question that our four years or more than four years of planning for a bioterrorist event definitely helped us both recognize and respond to this outbreak, but there are lessons to be learned. And I think, again, the biggest lesson to be learned with respect to both emerging infectious diseases and bioterrorism is the need for all of us, both the clinical and public health community to remain open minded to the unexpected as initially, again, those avian deaths were thought to be unrelated.

On a positive note, West Nile was detected because an astute infectious disease doctor saw something unusual and did the right thing. She reported it to us, and a responsive public health agency acted on that call, and public health agencies can't be aware of what's going on in their jurisdictions unless someone calls us, and we need to recognize that and actively foster strong relationships with our local medical communities. During last year's outbreak, the veterinary investigation unfortunately occurred largely in isolation from the human investigation and wasn't brought to our attention at the city health department, and we were the lead agency investigating the human outbreak until two days before the West Nile virus was identified, and that taught me that I also need to engage non-traditional public health partners, clinical veterinarians, wildlife experts and, as others have mentioned, epizootics where animal outbreaks may be early warning signs for human disease outbreaks, and we all need to recognize that many potential BT agents are also zoonotic diseases, such as anthrax and smallpox.
And although I'm proud that we detected the outbreak as soon as we did, I also recognize how lucky we were. At the time that our epi. investigation started last year, there were 19 patients hospitalized with West Nile in New York City hospitals, and 15 or 80 percent of them had not yet been reported to us. So if this one ID doctor hadn't reported the initial cluster, it's unclear when or if this outbreak might have been detected.

On a similar note, we, again, first became aware of the crow die-offs on Labor Day weekend when our hot line began to receive hundreds of calls, but we didn't hear that these birds were actually dying of encephalitis until three weeks later, and in retrospect, by going back and looking at some community newspaper reports in northern Queens, we found out or we now know that there were a lot of reports about bird die-offs in that area as early as late June, five weeks before the human outbreak began. So if the veterinary investigation had begun earlier and had been more aggressively investigated earlier, it's possible that the human outbreak might have been mitigated or even averted completely.

As far as surveillance, ongoing surveillance, similar to what would be expected of us as a public health agency during a bioterrorist event, there was a tremendous demand for accurate, up to date information obviously to guide control decisions and also to inform key partners, and this required the capacity on our part to simultaneously track and map a great deal of data, human, avian, and mosquito reports, both positive and negative, laboratory results, and there's no question that this was our biggest challenge, data management. It required the establishment of a sophisticated database to more easily track and analyze our surveillance data, and unfortunately we really didn't have a significant amount of information technology expertise in house. This was not easily available to us, and we actually relied on one EIS officer, who fortunately was assigned to New York City at the time to set this up.

During the '99 outbreak in the tri-state area, we all relied on a single lab at CDC, which happened to be in Colorado, so half a country away, to do all of our testing. They tested 2,000 specimens over this three-month investigation, and were open and actively working seven days a week, and this illustrates the need to both improve and regionalize our public health laboratory capacity so that we’re not in this situation again. CDC and the Association of Public Health Labs has recognized this with the establishment of a national laboratory response network, and I think there's been significant strides in enhancing our diagnostic capability for potential BT agents at the state and local level.

A number of speakers had mentioned the importance of surge capacity, and during the West Nile outbreak, our response at the communicable disease program was maintained from basically the beginning or even late August through the end of November. Our staff worked more than 12-hour days seven days a week for most of that time, and we did get some help. We got some reassigned staff from other internal programs, TB, STD, and AIDS, and also several CDC staff were sent to assist. No one stayed for more than three weeks, and it required us to continuously train new help as they arrived, and there's no question that from the surveillance and epi. perspective, the bulk of the response was
carried out by the communicable disease program staff, and even with the demands of West Nile, we were still needed and expected to carry out our core public health activities, such as managing cases of meningococcal meningitis and other outbreaks, which unfortunately continued to occur. At the time that this outbreak occurred last year, our program had only 13 surveillance staff, including field epidemiologists and public health nurses and three medical epidemiologists. But we are lucky compared to many programs in this country, especially at the local level. We're much bigger than most, and people need to recognize that public health capacity varies widely across the country.

Similar to a bioterrorist attack in a large metropolitan area, there's obviously going to be the need or will involve more than one jurisdiction, and there are challenges to being a part of a multi-jurisdictional outbreak investigation. At the peak of West Nile, there were 18 different local, state, and federal agencies involved. Coordination was not easy. It was primarily done via conference calls that lasted several hours, tended to be chaotic, and initially at least, it was unclear who was in charge. And this illustrates the need ahead of time for us to work out issues related to centralized coordination and decision making, the need for secure and efficient means for information sharing, and to have consistent methods and a common outbreak database for surveillance and laboratory tracking. During West Nile, each jurisdiction kept their own outbreak database, as did the CDC lab, a separate database, which made it very difficult to link results and summarize our findings. During West Nile, the public health response, again, required the rapid implementation of mosquito control in a city that did not have an existing control program, and our ability to do this was mostly due to our preexisting and very positive relationship with our local Emergency Management Agency.

Under the leadership of Jerry Hauer, we were able to facilitate an immediate and effective coordination of the response. Fortunately, our public health agency had some experience with the incident command system and emergency operations centers through numerous table talk exercises, anthrax hoaxes, and real city emergencies, such as ice storms and blackouts. And these clear lines of responsibility and authority allowed the city to rapidly mobilize equipment and supplies, establish emergency contracts and oversee the logistics of their response. Okay. I'll talk even faster.

The most difficult aspect of any emergency is obviously the need for communication to all those who need to know, and though I think our press office and the mayor's press office did an excellent job of making key officials available, it's easy for the media with our dailies to both sensationalize the news a little bit, and also politicize it. And obviously there's a need to insure effective communication not just with the media, but with a number of partners. The medical community, we need good links with the medical community. They need to get their information from us.

The public with the need to mobilize hot lines, have pre-prepared materials translated into different languages, and also to insure that key government officials are informed. That was a problem during West Nile. We really need to work with them to make sure they're supportive and help relay our message to their constituents. And, again, it goes
without saying the capacity to handle the media effectively and with the unified voice is key. Luckily during West Nile, there was a small number of cases. There was no need for mass care, mass prophylaxis, such as during the 1918 influenza pandemic or during the last smallpox outbreak in New York City in 1947.

So to conclude, similar to what occurred with West Nile, during a bioterrorist attack, there's no question the front lines of defense will be the clinical and public health community, and insuring our nation's preparedness will require enhancing awareness and training of clinicians, including veterinarians, to recognize the characteristic features of potential BT agents, and also the importance of reporting to their local health authorities. They need to know who to call, what to report, and how to reach us.

Also, we need to rebuild or build our public health infrastructure so that state and local health departments can be responsive when physicians call. The solutions are not high tech. We do not need fancy trucks or space suits. What we need is much more basic. We need staff expertise in infectious disease and epidemiology and information technology, reference lab capacity, the ability to respond 24 hours a day, electronic communication links, and good relationships with emergency management and local law enforcement.

This is my last slide, and I think this point has been made, that all of these funds for bioterrorism preparedness really have sort of a double value, the double Green Stamps value, as coined at the JFK School of Government executive session on domestic preparedness that I'm fortunate enough to participate in, and that all of these funds will make us better prepared, as happened with West Nile to respond to natural infectious disease outbreaks. I just want to end by saying in the past funding for public health infrastructure tends to be crisis driven, as occurred with West Nile, and unfortunately it's not maintained in the absence of an ongoing threat, and that there really is a need to emphasize the need for a commitment to continue and enhance these funds at the federal, state, and especially the local level. Every little of this money has crept down into local health agencies, and that this investment will allow us to cope with both natural and deliberate emerging infectious diseases.

And on that note, I apologize for going over, and thank you.

(Applause.)

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**Ken Bloem**

**Treating the Sick: Capacity of the U.S. Healthcare System to Respond to an Epidemic**

The department representatives like we had in the previous panel, community based agencies, Red Cross, local Rotarians, home healthcare agencies, possibly even the media or security services, and as well, potentially many other public health organizations and
community organizations, many of whom are represented by you in the audience this afternoon. So recognizing from the outset that we have before you some, but not all of the critical players in a response to a bioterrorist event, the question before us to our panelists is: could our health care system adequately respond in the event of a bioterrorist attack? Are the pieces in place? Are the necessary players coordinated, aware, prepared for the threat? Will there be adequate coordination and back-up between government agencies, civilian and military, and our private, non-governmental health organizations? Do we have appropriate federal and state policies supportive of this coordinated or even integrated response? The format of our session, which will adjourn promptly at five o'clock for an exciting evening reception and dinner and presentations, will be as follows:

I'll introduce our speakers. I'll make two minutes of introductory comments. Our speakers then, without further introduction, will speak each for 15 minutes. Then we'll open it up to questions, which hopefully we'll have many.

Our five speakers are:

Jim Bentley, Senior Vice President for Strategic Policy Planning at the American Hospital Association. Jim is truly one of the leaders of the AHA, prior to which for 15 years he was one of the leaders of the Association of American Medical Colleges. He spent five years in the U.S. Navy Medical Corps service, among many other activities. He's been a member of the Board of Examiners for the Malcolm Baldridge National Quality Award. He's published in a wide variety of journals. He was educated at Michigan State University and at the University of Michigan.

Dr. John Bartlett, Chief of Infectious Disease at Johns Hopkins University. Dr. Bartlett received his M.D. from the Upstate Medical Center in Syracuse, completed his training in internal medicine at Peter Bent Brigham and at the University of Alabama in Birmingham. He's enjoyed faculty positions at UCLA, at Tufts. At Hopkins he's been the principal investigator for over $30 million of research funds, has written more than 600 articles, 13 books, and is truly one of the giants in his field.

Jeff Rubin has been involved in health care administration planning at the level of disaster medical service planning of which he is the Chief for the State of California, a state, by the way, that truly under his tenure has been tested time and again. He's had leadership positions in public health programs, in primary care clinics, in emergency medical services, and others.

Admiral Robert Knouss is Director of the Office of Emergency Preparedness of the U.S. Public Health Service. Dr. Knouss was trained at the University of Pennsylvania, and prior to that at the University of Wisconsin. He entered the Public Health Service and was first Chief of the Physician Education Branch in NIH and Director of the Division of Medicine in the Health Resources Administration. Among his numerous assignments, he's directed the Public Health Service's refugee health activities in the Cuban-Haitian and in the Southeast Asian refugee crises.
He was for ten years deputy director of the Pan America Health Organization, and in his more distant past, he was a staff member for the Senate Committee on Labor and Human Resources.

Brigadier General Bruce Lawlor is the first Commanding General of the Joint Task Force, Civil Support, located in Norfolk, Virginia. General Lawlor was educated at George Washington University, subsequently received his law degree at George Washington, a Master's in national security affairs from Norwich University; a graduate of the Harvard National Security Fellows Program. He has taught at the U.S. Army War College, served as a consultant to the Defense Sciences Board. He has a highly distinguished military career that includes major assignments and commands in Europe, in Vietnam, and among his military awards and declarations include the Defense Superior Service Medal, the Legion of Merit, Defense Meritorious Service Medal, the Republic of Vietnam Gallantry Cross with one gold and one bronze star, and the Vietnamese Honor Medal, first class.

Now, the number of speeches that you've heard today is many, and to battle against what Dr. Poste elegantly described as induced lethargy, I've been encouraged to add a note of shall we say pungency in the hope that our speakers and you, the audience, will focus as much as can be on the big issues, to focus on the forest, if you will, rather than to perhaps get lost in the trees.

So in setting the stage for our presentations and discussions, let me provide just a few personal observations. I speak to you now as a hospital administrator, a manager who's led institutions on both coasts, as well as in the Midwest, and here are some personal observations, hopefully not overly provocative. If so, apologies for any overstatement.

The physicians that I have worked with aren't trained to diagnose anthrax, smallpox, or plague. In fact, they've never seen a single case. The CEOs that I know, that is, CEOs of hospitals, just don't have bioterrorism on their screens. Bioterrorism, after all, is a low probability danger with no federal funding when my CEO colleagues deal daily with 100 percent certain dangers which have significant financial ramifications for their institutions, in addition to dealing with staff shortages, shrinking hospital margins, rapidly runaway pharmacy costs, to mention just a few.

Thirdly, in some U.S. cities, in some of those where I have served, the public health departments and the hospital leaderships don't talk to one another, at least certainly at the senior most level. In fact, in my opinion, I think they live in parallel universes, not knowing each other's names, not having met one another, not knowing each other's telephone numbers, not truly knowing each other's responsibilities or problems.

Fourthly, federal policy is based on a premise that the feds will act only in support of, as I understand it, local civilian efforts. Now, this policy just may, it seems to me, be flawed from the outset in that it assumes, first of all, that there are local plans for local effort, and secondly, that those local plans, in fact, could manage for the necessary 48 or 72 or 96 hours, before, in fact, federal support would come in.
Many of my colleagues in hospital leadership positions are unconvinced on the premise of this policy. Furthermore, federal policy profoundly underestimates, in my opinion, the lack of surge capacity in the U.S. hospital sector. The manpower shortages that affect current, that is, daily Cortidian (phonetic) operations. For ten days, for example, in last December, 1999, during a relatively mild flu epidemic, three-quarters of Los Angeles' emergency departments were so full that ambulances had to be rerouted.

Now, as a leader and as a part-time student of complex organizations, I am lastly a believer in simplicity, simplicity insofar as routine operations are concerned and all the more so in times of crisis or disaster. However, as regards the full panoply of federal and civilian agency response plan to bioterrorism, well, I must confess even with an advanced degree and having heard numerous descriptions of the federal response plan, I am still confused. The complexity, the alphabet soup of agencies, units defies at least my common sense.

My hope is that our panelists will disabuse me of some of these impressions or at least that we will set the stage for an energetic discussion to follow.

Jim Bentley and then without any further introduction will be followed by Dr. Bartlett and others.
(Applause.)

James Bentley, PhD

Challenges for Hospitals

What we want to talk about here in at least this particular session is what happens when despite the best detection, the best prevention, the best information, people get sick in a bioterrorism attack and wind up going to the hospital. The hospital because it's 24 hours a day, 365 days a year, and it's where you and I and our friends and neighbors assume we're going to get care.

The question before us is: what are the challenges facing hospitals as they confront the environment you've heard described so well this morning and afternoon?

I'd like to share three things with you in the 15 minutes that we have available. First, let's talk about -- and the first slide -- three things or the first of three things that are really bothering the hospital community in terms of knowns today.

The first one is the financial crisis that our hospitals face in terms of what they may think of as the perfect storm. Like the book or movie you may have read or seen which brings together three weather patterns together, we currently have an unprecedented change in the three major payment systems that support hospitals. The Balanced Budget Act passed in 1997 has extracted significantly more money from the Medicare payment
stream than Congress intended, and whether or not they're going to fix that in the remaining days of this legislative year is anyone's guess.

Secondly, most states have moved from a Medicaid payment system for the low income citizens to a system of using managed care plans, and in doing that on a per person basis they said we will spend no more before moving to managed care than we do afterwards, even though the administrative costs of managed care add 15 to 20 percent to the cost of the program so that that 15 to 20 percent had to come out of the cost of caring.

And thirdly, private payers concerned about their cost and competitiveness have been extremely diligent in holding back on their payments. For the hospital that now says, "I want to spend on behalf of my community significant sums of money preparing for bioterrorism or a similar event," that is a red flag to the payer community of saying, "We overpaid you. There's room to negotiate downward because no one pays for planning and preparation."

We are in the midst of a major and significant work force shortage throughout the hospital community. Every ten to 15 years for the past 40 years, someone from the American Hospital Association or the American Nurses Association could have stood up here and described how we had a shortage of nurses, particularly at a time when the economy was doing well.

That case exists today, but it's not longer the core problem. We have a shortage that's not just nurses. It's pharmacists, it's technologists, it's technicians, it's housekeepers, it's food service workers. It's throughout the entire establishment, and that shortage is the real constraint on capacity and surge. The shortage is not only short term, to be eliminated perhaps if the economy softens, but it is long term because we face a demographic shift in which the Baby Boom generation had more people going into health careers proportionately than the smaller, subsequent generations coming along.

And third, as we work with young people, we find that involvement in health care careers has moved from a favorable occupation 30 years ago to an unfavored occupation or set of occupations today, and so we're not recruiting well.

So financial problems, work force problems, and if we have too much of one thing, it's regulatory burden on the institutions. This list is a partial list of the regulations currently out there requiring attention by the executives in the nation's hospitals. Every one of those lines lists something that a federal agency believes is appropriate to require the health care system to do.

The difficulty for the health care system is that the sum of those regulatory initiatives exceed both in cost and management capacity the ability of the institution to adapt change and manage. And so we have as the hospital moves forward and looks a bioterrorism a situation in which funds are tight, staffing is short, and regulatory burden for other areas is high. When the CEO and his team or her team sits down and then says,
"Let's look at bioterrorism. Let's look at a biological event," what are the unknowns? Here's a partial list.

- What's the substance or agent?
- When and where might it strike?
- On what scale will it spread in our community?
- What personal protective gear will OSHA require?
- What will EPA require in the way of disposal of contaminants?
- What will be the impact on the still coming stream of current patients? After all, if you are a mother about to give birth to a child, you may not find going to a hospital that has a large number of infected patients a very tolerable idea.
- And what do we know about the science and procedures for addressing this?

In most cases when the hospital executive sits down with folks like in this room and asks those questions, we generate more questions and very few answers on which they can begin to plan.

In the face of that, the Office of Emergency Preparedness, Dr. Knouss' agency, gave us a small grant about a year ago to bring together people from the federal government, some in this room, people from hospitals throughout the country ranging from CEOs to people responsible for equipment and materiel in the institutions, begin to look at what would we find in a mass casualty situation.

A couple of general conclusions. One, mass casualties by definition will overwhelm the capacity of hospitals and the health care system in this country. We have for 20 years in the interest of cost containment striven to reduce capacity and flexibility. A mass casualty incident with great numbers of new patients will take us beyond the capabilities to address in any normal sense.

In that environment the hospital needs to react in three levels. First, it has to react to that overwhelming capacity as an organization in its own right, its own disaster plan, its own accommodations and changes. Secondly, the hospital has to react as a part of the community's health care system, the physicians, the public health agencies, the laboratories, the school health nurses, the visiting health nurses, the nursing homes. And third, and perhaps most difficult, because we have not had a lot of experience in this country, the hospital must react as a part of a community-wide effort that extends far beyond the health care system as one begins to look at police and fire in terms of public safety roles, schools in terms of perhaps feeding and housing roles in a bioterrorism incident. And so we have the hospital trying to work at three separate levels.

Now, when we got the group together, and we have about 60 recommendations from them, you can get the entire report if you care to download it. It's only about 70 pages on our website, which is www.aha, for American Hospital Association, .org, and you go to member services and click under it and there is the report. The recommendations for hospital preparedness centered in four areas: the need to prepare for a community wide
response, staffing, communications including the need for a single voice for the community, and public policy.

I'd like to emphasize staffing and public policy in the last few minutes because I think there are a couple of examples there of the kinds of concerns that don't often make it to the top of the list of a meeting of this nature. You can see in the light gray some of the things we often talk about. I'd like to ask you to focus on the bottom item, the one in blue. As we've in the past two years brought together hospitals and talked about mass casualty or mass disaster incidents and asked them what was the real, most important and most unexpected bottleneck. It is care for family members of the hospital staff.

Seventy to 85 percent of the hospital work force is female. Most of those people are heads of household or are responsible for the care of family members in that household. Lots of disasters, an airplane crash, a truck blows up, a bus goes off a highway, are very short incidents. They're here. They're gone in 24 hours, minus a couple of people who stay in the institution. Hurricanes, floods, bioterrorism incidents by contrast are going to be long duration events requiring that staff stay, remain, and return, and their ability to do that consistently depends upon the ability of their family to be protected and cared for.

Hospitals have tried two patterns that haven't worked. One pattern has been to say you may bring your family to the institution. Then you'll know they're safe. That's probably not a welcome strategy in a bioterrorism incident. Similarly, saying to the staff as some hospitals have, "Go home. Take care of your family and return," may not be a successful strategy to the staff member who goes home, turns on television, and sees whatever the media focus is in terms of uncertainty, risk, and the next scary story. We cannot tell our hospitals and their staffs that there is a national decision that the staff members and their families will somehow have priority in terms of immunizations or antibiotics, and it's very -- let's say it the other way -- it's very likely that at least some hospital staff will question whether they want to put themselves in harm's way if prior to an incident we're not able to staff staff whether our society has valued them and protected them.

So I would ask you in addition to all of the sophisticated topics, all the electronics, all the detection equipment, the social organization of the community, the ability to sustain the hospital staff at work in our members' judgment becomes one of the critical factors as to whether the hospital can survive or not.

There are areas of public policy that look to be quite detached from bioterrorism or biomedical warfare, if you will. One of them here is the Emergency Medical Treatment and Labor Act. That's probably something as you've worked on bioterrorism you've not thought of, but this is what it requires. One, the hospital must screen and stabilize every patient who presents him or herself even if the emergency department is closed. Two, it has a bias of caring for the individual over the community, and it doesn't allow the community to separate hospitals, if you will, in an infectious incident into hospitals that are clean and hospitals that are exposed and tell the clean hospitals not to admit, not to
care for an exposed patient, and vice versa. Both categories simply have to see, stabilize
and screen any patient who makes it on the property. And, third, there is no concept of
an exception circumstance such that a mayor, governor, or other official could waive the
general rules of the Emergency Medical Treatment and Labor Act in the public health
interest of the community.

Now, the act was passed for very good purposes. It was designed to prevent a hospital or
physicians in a hospital from refusing to see a patient who did not have insurance and
simply sending that patient on to another hospital. A very legitimate purpose.

But in the context of a bioterrorism incident and the ability to differentiate hospitals and
make community wide or community level decisions, EMTALA gets in the way just as
we see in other places there are limitations on what the hospitals can do.

So the bottom line here that I would raise to you is three things. Number one, hospitals
already face severe challenges, and they're really not looking for more unfunded
mandates. Number two, there are issues like care of families or federal statutes like
EMTALA that get in the way. Number three, as the hospital's CEO and leadership team
sit down with the trustees and try to balance today's requirements for care and needs
with tomorrow's possibilities, I would like to ask you to rethink one phrase that we've
heard in this room throughout the day, and that is weapons of mass destruction.

There is no more harmful term to interesting the hospital community in preparedness
than weapons of mass destruction. It holds out no hope. It's a very politically charged
term. It is a very negative term. And if as you address the issues of mass casualties by
bioterrorism or by any other cause you can find a term that offers people the prospect of
hope, the prospect of participation, and makes it reasonable for a board of trustees to
say we will put money into tomorrow because it's in the interest of our community
rather than put money in tomorrow to deal with weapons of mass destructions. The
words being used are important, and as we work with hospitals and communities
around the country, the words currently being used, particularly weapons of mass
destruction, are reducing preparedness and reducing interest.

Thank you very much.
(Applause.)

John G. Bartlett, MD

Mobilizing Professional Communities

Well, I'm John Bartlett, and my charge is to discuss mobilizing professional
communities. I want to thank the organizing committee for inviting me to participate.
I'm a member of that committee.
(Laughter.)

There's 600,000 doctors in the United States. I'm going to talk mostly about doctors because that's the community that I know the most about, but I would not for a moment deny the equal importance of nurses, paramedical personnel, and the other people in the health care team.

But I've talked to a lot of physicians in various parts of medicine, and I would have to say that, to be brief, they all are aware of bioterrorism. The great majority understand that it's an important issue. A limited number think that it's an issue for them, and almost none know about local plans or have participated in local plans for preparedness. And so my first slide here summarizes this question. Why do physicians reject participation in what everyone here is gathered to talk about?

Managed care is one of the major issues, and we've heard a bit about that already in terms of what it means, but I've talked to a few people that work in managed care groups, which is now a major portion of the physician work force, and what they get is 15 minutes a patient for seven and a half hours a day for five days a week with a schedule that's made three months in advance. That's 30 patients a day, 150 patients a week. If they miss an hour, they have to make it up. Our meeting today is on Tuesday. That's my clinic day. I have to make up nine units at some point.

The second issue is it's a low probability event, and I think everybody knows what that means. So for the physician in Cincinnati, bioterrorism is important because it will probably occur someplace in the United States, but the probability that it will occur in Cincinnati is regarded as very low. I don't mean to pick on Cincinnati. I'm from Baltimore. So you have to be careful.

They tell me they're not trained to do this. They're not paid to do this, and they're not required to do it, and the reason they're not required to do it is because it's not been made a mandate or a high priority by people in authoritative positions within medicine. And Jim Bentley and Ken Bloem have already talked about that issue. There's also an information avalanche. That's an awful lot for doctors to try to consume. I personally take 40 journals, but I only try to keep up with infectious disease. It just is an awful lot of information.

Physicians in general, at the bottom I've noted two idiosyncrasies of physicians. One is they tend to be fiercely independent, and people that deal with physicians probably know exactly what I mean by that. Sometimes they're compared to teenagers. The only way to get them to do something is to tell them not to do it.

(Laughter.)

And then they would do it, and they tend to prioritize the individual patient because that's what they do. That's how they spend their life. They don't tend to think of patients as populations. They've never done that, and it's unlikely that they would be easily
persuaded to think in those terms.

Now, I wanted to go on to say something about where they fit. We've already heard about this. So I don't need to belabor the points, but I thought the West Nile virus epidemic was important instruction in a couple of places. First of all, Dr. Asmis was the alert physician who called attention to this on the basis of two unexplained cases of weakness and cerebral spinal fluid, pleocytosis, and called Marcie Layton who implemented the program for detection that you've all heard about that eventually uncovered an epidemic.

Now, it turns out that this is perhaps an -- I don't mean to imply at all that this had anything to do with bioterrorism, but it's perhaps instructive in terms of the way it played out.

Where do you want the physicians to be participants in this? Well, in this scenario they were critical in the detection, and they would have been critical or were critical for managing the cases. This was aberrant because there was no treatment, no prophylaxis, and no patient-to-patient transmission. So some of the challenges that we know about for the health care system and the management would not apply here. So this is a marriage between public health and the practicing community in which there are distinctive roles, but critical interaction that is absolutely mandatory to make it work.

So what is the role of the physician in practice? First of all would be the recognition of the case, either as a single case or as a cluster, and I'll talk more about that in a minute.

The second is in policy making, but they bring their expertise in the terms of medical management, and then for medical practice, it will be medical care for the patients who are sick and then the distribution of any sort of prophylaxis.

And finally is sort of the issues dealing with the legal and ethical component of this and the credibility of physicians. By and large, I think the American public hates doctors, but they like their own doctor. Well, it's true. The lawyers always tell me medical people hate layers until they need one, and then they like them. In terms of how to engage physicians to be better participants, I've suggested these things. First of all, they will continue to think that this is an issue for someplace else. It's a low probability event for wherever they are, and most of them will be right.

However, whatever we learn about bioterrorism can also be applied to influenza and the movie we saw as a great example of how that could play out. West Nile virus is an example. E. coli 157, a variety of different type of epidemics in a system that has almost no surge capacity that you've talked about.

Credibility. Physicians, by and large, listen to peers, and they have that attachment to a peer system that is probably unprecedented in professions. So Sid Feingold says this is how you treat an enterobic infection. You just do it. You don't ask questions. If D.A. Henderson says this is how we should respond, we tend to line up and say, "What do we
do next?"

There are some people who have that kind of established reputation in medicine, and I'm not sure what gains it. Lily Weinstein had it. I've given you a couple of other examples of it, but by and large it's reputations that have been hard earned, but very deserved.

Physicians tend to listen to their professional societies. They have an attachment to their society. It's viewed as their peers, and they will pay attention, and they will also pay attention to organizations for which they have enormous respect in the CDC and several other organizations would be in that classification.

Physicians don't like to go to committee meetings. They don't like to be on committees. When I took charge of my division I said we would have committee meetings when people wanted them, but they always had to be before six o'clock in the morning or after six at night or on a weekend.

(Laughter.)

And people always found ways that they could get their work done without having meetings. This has to be a group that is dealt with with extraordinary efficiency, and in terms of what is efficient, I think perhaps the development that is most prominent is the point of care decision tools that give physicians information at the bedside. It's information within one or two minutes. It will be with some hand-held device. It will be like a Palm Pilot or a CE or something like that. It's likely to be in general use within a year.

In terms of rewards, you can either reward the physician or you can penalize the physician. To reward the physician, you could put it on the boards. People study for the boards. Whatever is on the boards they're going to learn.

You could pay, and what I mean by pay, I don't necessarily mean monetary. It could be paid in time, pay in job description, but by and large, as we have heard, this is a part of the puzzle that at this moment is unfunded. There is no source or resources that I'm aware of to do this.

And the penalty would be JCAHO and the mandate to do this, which will always get the attention.

Now, if we had a Palm Pilot program, something that's right in the physician's hand at the time that he sees 30 patients a day, what could we put on it that would say, "Think bioterrorism. Call this number"? Well, I worked on this list. I worked from several other lists and came up with what's on the slide. We have a lot of patients who die with pneumonia. It's about 40,000 a year, but I have to say I never, never see a young previously healthy adult die of pneumonia in the year 2000. It doesn't happen. So if that did happen, I would be very worried. Summer flu is self-explanatory.
Critical illness. What could take a member of this audience who's basically health from being healthy to moribund or critically ill in a period of a day or a few days? Toxic shock syndrome, Neisseria meningitides, meningitis or bacteremia, Rocky Mountain spotted fever. The list is short. By and large, healthy people do not get critically ill fast.

The wide media stinum, of course, specifically suggests inhalation anthrax. The rash of smallpox can only be confused with chicken pox. There’s no primary dermalogic disease that looks like that. Viral hemorrhagic fever does not occur in this country. Dick Johnson tells me that the only thing that might be mistaken would be a return of dengue if it happened, but the capillary leak syndrome should alert us all.

Or you could have a laboratory diagnosis, not a clinical diagnosis, but inhalation anthrax never occurs; smallpox never occurs; glanders never occurs. It just does not occur. If it ever occurred, then it should call attention to this as a possibility.

The hemorrhagic fever I talk about, and non-endemic tularemia or plague, and I've covered most of the Class A organisms and a chunk of Class B as well, and those are individual cases, and then, of course, is the more obvious, which are the clusters that are unusual, severe or unexplained.

So that's what I would put on the hand-held device in order to have physicians better participants in that early part of the equation.

Now, in terms of the societies, I mentioned that physicians by and large entrust their societies and participate in their activities. The Infectious Disease Society of America has 6,000 members, and about 3,000 of those are practicing physicians, and as an example of what they have done in the area of bioterrorism, there is a committee called the emerging infection committee that's headed by Mike Hauster, whom we all know. The co-chair of that committee and the head of the subcommittee on bioterrorism is D.A. Henderson. They've written a draft of a white paper which expresses outrage to our colleagues in other places who participate in waging war with microbes. There's an EIN at work that I'll talk about. They're developing educational materials in concert with the CDC, SHEA, state health departments, and so forth.

There is a CID which is clinical infectious disease. The society journal, which has a section devoted to bioterrorism. It's presented at annual meetings. It's included in guidelines when it's appropriate, and they have a major role in this conference.

So in terms of a couple of things that I just mentioned, this is the second here, but I also wanted to mention the fact that there's a couple of other relevant people here. For the section on biologic weapons, it's Dr. Henderson, Dr. Inglesby, and Dr. O'Toole, and then you can see Mike Osterholm and Larry Strausbaugh, as well, who I'll talk about momentarily.

Here's our guidelines on community acquired pneumonia. There are 300,000 copies of
this that were sent out by request. So it's gotten a wide distribution, and we think in order to do this right you've got to be in people's face. So in all of our guidelines where it's appropriate, there is something dealing with bioterrorism if it's relevant to the topic. And then this is a portion of the program in 1999, a workshop for practicing physicians on bioterrorism, who's headed by David Relman, who is the chairman of the program.

The Infectious Disease Society also has an emerging infection network that's headed by Larry Strausbaugh, which is a field force. It's 900 physicians trained in ID in all parts of the United States who have received information regarding what to look for, who to call, and what to do. They're funded by the CDC in a cooperative agreement. They're in their fourth year, and they exchange information by fax and Internet, and they're wired now to bioterrorism, and it's a field force, if you will, and in some ways it's quite unique.

Now, I should also mention that SHEA also has a bioterrorism plan. They have some of the similar underpinnings, as does the American College of Emergency physicians who have written a paper dealing with specific recommendations for the health care profession relevant to that group.

And finally I should mention the Center for Bioterrorism, which represents a network that communicates extensively with physicians, as well as others, and their activities include a quarterly newsletter, which can be received free by anybody that requests it. They have a website. They have a number of publications in good journals, as well as white papers dealing with methods to manage anthrax, smallpox, plague, botulism. Tularemia is about to come, and then they have the reviews that are mentioned in a variety of journals that really reach a wide readership.

There are 250 to 300 lectures a year. They've arranged a number of conferences, including this one.

In terms of their website, the activity is shown here. I'm not sure that either the people at the center are aware of these numbers. They get about 1.5 million hits so far this year. That's a very deceptive number because it doesn't mean very much.

The visitors session is 67,000; unique visitors is 23,000. The average is 162 a day, and the average visitor session is incredibly long for a website and averages 30 minutes. That's about twice what it is with any of our other websites.

And finally, where do we stand with regard to the issue of the test? Well, I call Harry Kimball, who's President of the American Board, and, you know, the American Board of International Medicine exams are like a military secret. I mean they're not going to say anything. So he gave me this statement.

(Laughter.)

The ABIM recognizes the increasing importance of bioterrorism. But actually that may say a lot more than what you think it says.

So those are my ideas about how to reach the physician audience. Let me just mention
what I think are the most important summary points. This is an area that as far as I know is almost completely unfunded. We heard before 0.0046 percent of something, and this is probably lower than that in terms of the total allocation at least as far as I know. Most of what I've shown has been stuff that people have done with their own resources and their own energy in time that's fairly precious, and it represents the effort of the American Board, the medical societies, the center that's sponsoring the conference and a lot of volunteer efforts by a lot of different people.

In terms of education, I think we really need to continue to be in the face of physicians so that they are aware of this, even though they may not chew and digest it, and that's probably best done through the medical journals, speeches, and then we probably have to have this now incorporated as some part of a medical school curriculum. Quite frankly, I don't know anybody that's really done that.

There may be the necessity of using a carrot or a stick. The carrot, of course, would be pay or some other reward. The stick would be to have it as part of the JCAHO requirements, but there may be something necessary in order to get the participation that I've talked about.

The societies that I've talked to are doing a pretty good job of making sure their members are hearing about this and have access to the right information. Some are moving faster than others, but all of the relevant societies seem to be doing something.

And finally, in terms of how to recognize and respond to problems, my own view is that trying to teach physicians through journals and speeches and so forth in this area the way it's currently being managed is going to be very difficult without resources to do it, and the only way I can think of to do it that will probably make any sort of impact is to have it in the point of care device where the recommendations are given with quite great clarity, with some specific recommendations about what to do.

That completes my remarks. Thanks.

(Applause.)

Jeffrey Rubin

Institutional Networks: Regional Responses to Disasters

I was just told to cut a minute off. Actually I'm going to cut a minute and a half off. I want to do something that I need your cooperation on. I don't want anyone to say a word. I just want you to stand and stretch for 30 seconds.

(Applause.)
Okay. You've been very good. You can sit down now. You just practiced the first principle in disaster planning, response, and recovery. That's flexibility.

(Laughter.)

This afternoon in the remaining time what I'd like to do is talk to you a bit about California's experience and the approach that we're talking in working to develop regional and state wide response networks to disaster, particularly in regard to cooperative strategies with hospitals. I ask you to set it within the framework of the overall disaster, medical and public health, environmental health planning, response and recovery system. That system, I think, is important in that it's an all hazard system.

What we're talking about today, bioterrorism, pandemic influenza, are unique portions of a particular kind of disaster or hazard that we must face where the public health community comes into the fore, and we need to learn how to work better to integrate them into that overall system. The system begins at the local level, the hospitals, the physicians, public, environmental health, fire, law enforcement, and emergency management. I'd like to focus, again, specifically now on the hospital side of the picture. This is my vision and that of our office.

To get there, we believe it's our role to promote disaster medical preparedness and response planning and exercising and training and development within the State of California with the industry so we can forge better regional, state-wide, and at the local level community-wide partnerships. On the next two slides, you're going to hear some of the same information that you heard from the previous two speakers, and I ask you not to think that that's redundant. Actually I think it's important. It shows the other side of the coin, the provider side of the coin, from the hospitals' and physicians' perspective, as well as the fact that on the government side we have to understand what they're going through. If we do not, we're doomed to failure. It also shows that we as bureaucrats can actually learn over time.

I think the last point here, and it was made by Jim earlier, and the previous speaker also regarding physicians, is that we really haven't done a good job in reaching out to hospitals and selling our idea of the importance of preparing for a terrorism event here in the United States. We really haven't done a good job in selling emergency preparedness to hospitals and the health care industry, and I think we have a lot to learn and a lot to work with with our partners in the health care industry to make strides in this area. The results have not always been optimal, and I can use our state as an example, but I know unfortunately there are others around the country. In the Loma Prieta earthquake, we had a hospital pick up in the air a couple of inches and sit back down again. That cause simultaneous internal and external disaster. They had written plans to deal with that, and they had written plans on how to manage that kind of a response.

So in the intervening years before the Northridge earthquake, rather, we helped them by working with a group of hospitals and county governments in developing an incident
command system for hospitals to help manage a disaster response. In the Northridge earthquake, our seismic safety commission documented those hospitals that did use the hospital emergency incident command system, had an easier time and did a better job in managing the response. Unfortunately, some hospitals weren't using it, and there were more difficulties that they experienced. We had hoped that we had really worked out a lot of the issues in planning and response for the hospitals in an emergency, but a couple of years later when we had 165,000 people evacuate due to flooding, we found that two hospitals refused to leave. As a matter of fact, they went and took in extra patients and moved them all up to a higher floor. If the levies had broken, I have no idea how we would have gotten them out of there.

A year later we had the influenza season, and what happened there essentially is that we had hospitals, again, not working within the system that we had all tried to put together. They were calling the National Guard asking for nurses. They were asking county governments to declare local emergencies. So obviously we have a long way to go.

There's three different approaches, and I think the two previous speakers mentioned them. You can throw money at the issue. You can mandate it. Again, the carrot and stick, or you can look at shared goals that we buy into collaboratively. In California, being Left Coasters and being all inclusive, we have to take a holistic approach. Let me call it that.

(Laughter.)

We do believe there is some need for additional funding, whether it's in the planning and preparedness end of things, whether it's in the response in. You know, we cut a deal with FEMA following the Northridge earthquake to reimburse hospitals for some of the -- and clinics for the extra services and staff that they brought in, supplies, and unfortunately the hospitals were never reimbursed. We can't continue to do that. We have to figure out a way to reimburse them for the activities and the services they provide.

We need to figure out what the proper role is of this whole weapons of mass destruction arena and how hospitals relate to it and how we can utilize some of that monies to better prepare them. There is a role for mandates. Because of our experience in past disasters, we are working with our Department of Health Services, which licenses health care facilities, to upgrade our requirements of health care facility disaster plans.

We also have a new Seismic Safety Act. Actually it's a couple of years old. It's just been extended as far as implementation date to build better and stronger and safer buildings. And the new JCAHO guidelines which most of you are aware of regarding environmental care, we think they're absolutely critical because for the first time they move the hospital industry and health care industry closer to the emergency management industry, and we talk the same language, which I think is very important.
But I think we're going to see much better results if we have shared goals. We've tried in California over the last couple of years to hold annual medical and health disaster conferences focusing on hospitals in the northern and southern part of the state. They have almost 500 people attending. Last year, the first year we did our annual state-wide exercise, 400-plus hospitals, 56 out of 58 counties, 100 ambulance providers. We just finished the exercise a week ago, and we're counting up the numbers, but it looks like it will be pretty close again, again bringing the hospitals into concert with the government's need to plan for and train for disaster response.

We're very proud of a subcommittee we have developed for the California Health care Association, our state hospital association. In working on developing model HAZMAT protocols, in model bioterrorism annex plans for hospitals, they're the ones developing it. We don't mandate it. There's an ownership there. There's three or four major hospital systems representing almost 200 hospitals on this group, and we think if it comes out of the industry itself we have a much better chance of selling it within the rest of the health care industry and the state.

We're also continuing to promote the hospital emergency incident command system. We think it has a lot of benefits. It's available for free from our website. We'll send you a free video.

We believe that regional, community-wide, cooperative agreements are important. In Portland, Oregon, in Reno, Nevada, here in the Washington, D.C. area, they've made these kinds of approaches to dealing with how the hospitals can together work to share resources in time of need, and I think that that's absolutely critical. In a typical hospital in Sacramento, you may find a nurse who works in three different and separate health care systems. We've got to train the staff in a common way because they'll be in different places.

We have to have shared communications systems. That was talked about earlier. We have a system we're using in eight counties serving 18 million people, the Ready Net system. It comes from the Health Care Association of Southern California. It's used daily for EMS diversion, multi-casualty incident, hospital status, ED availability. They used it during the Democratic National Convention to do surveillance. I think this is a step in the right direction.

And also the Health Care Association has developed a model for standardization of emergency codes. Again, nurses and staff working in different facilities; we need to have standardization wherever possible. We think if some of these efforts pay off that we're going to be better prepared. There will be better awareness, more widespread awareness, improved planning, improved training, and staff preparedness. That will benefit all of us. And we firmly believe this cannot be done by an individual, an individual organization, an individual health care provider or government entity. We have to work together.
We don't have all the answers. We're not even sure if we have some, but we have some thoughts on it based on our experiences, and we'd be very glad to share them with you in detail. Thank you for your attention today.

(Applause.)

Robert Knouss, MD
National Disaster Medical System

Today I want to spend a few minutes just telling you a little bit about what the Office of Emergency Preparedness is all about in the Department of Health and Human Services, and the fact that when one of these events happens, there is an infrastructure that's available to at least begin the federal response and to try to amass some resources that might be appropriate to address the problems that might be created for the health care delivery system.

Our office, the Office of Emergency Preparedness, is really responsible for a variety of responses or responses to a variety of events in which local and state health systems are overwhelmed, and that might be as a result of natural disasters. It could be transportation disasters. For example, we do all of the victim identification when we have commercial airline crashes; for counterterrorism when we might have a terrorism event that would overwhelm local health care system's ability to response; and technological disasters, such as the Y2K if we would have experienced some significant shortfalls in health care capacity during the millennial change.

Now, the federal response plan was referred to earlier. It was referred to as something that’s fairly complicated. Actually, I think the federal response plan has made something very understandable out of something that could be very difficult to understand. And essentially the federal response plan says that during any major disaster in the United States, there are 12 essential functions that have to be performed in order to be able to have an appropriate response to the consequences of that disaster, and they involve everything from mass care to transportation needs to urban search and rescue to environmental health, to environmental issues, to health and medical services. And the health and medical services piece is called emergency support function number eight, and our department is responsible for that, and we have 12 other departments that work with us in providing their resources to assist in meeting the challenges that would be faced by the health care system in the event of a significant disaster creating mass casualties.

Now, actually ESF-8, which is referred to, has four principal functions: preventive health services, environmental health services, medical services, and mental health services. There are a large number of different functions that are mentioned, but basically it falls into those four categories. Now, two of those are really resource intense,
both the medical services that might have to be provided to mass casualty victims or mass casualties or mental health services both during the acute phase or in the long term after the disaster, and those two resource intense responses are largely accommodated through what’s called the national disaster medical system, which has been in existence for the last 15 years. It’s a public-private partnership. At the federal level it’s made up of a partnership of the Department of Health and Human Services, the Department of Veterans Affairs, the Department of Defense and the Federal Emergency Management Agency. And it was created to address two kinds of overwhelming medical care requirements. One is from a civilian disaster where we need to address extraordinary community needs, and the second is in a military contingency in which we might have a large number of casualties that could not be accommodated by the Department of Defense or Veterans Affairs.

Various departments have different functions in this system. The Department of Health and Human Service, which has the lead for the system, is responsible for providing primary care both at the scene and at places where people might be distributed if the local health care system cannot accommodate them. The Department of Defense is responsible for patient evacuation, and both the Department of Veterans Affairs and the Department of Defense are responsible for providing definitive care. And now that is not through their own facilities, but through hospitals that they have asked to join in the national disaster medical system from the private sector that are in their vicinity where their facilities are located.

Just to elaborate a little bit more from a medical response point of view, we have between seven and 8,000 volunteers, health professionals around the country organized into teams which are affiliated with the national disaster medical system. About 35 people from each one of these teams is at least the requirement for the initial response. So that because we have so many teams, we can actually field a very substantial health care work force in the event of a disaster. But we’re talking now about a disaster that's in a localized area, not a disaster that is covering essentially all of the country at the same time where they are equal health care burden -- I hope time hasn't run out just because my watch has fallen -- health care burdens around the country, and they represent a variety of medical skills. They’re locally sponsored teams. They’re available to the states if states have a need for them, and they are community based.

Now, just to give you an idea of the extent of these teams, we have 27 primary care teams that can respond within a 12 to 24 hour. There are three teams on the West Coast and three on the East Coast that are on call at any one time. We have four national medical response teams, one located here in Washington, one in Winston-Salem, one in Denver, and one in Los Angeles, that can respond to the unique requirements of a chemical or biological weapons attack. We have burn teams which are essential, particularly in these kinds of scenarios, if we would, for example, have a mustard gas attack, because of the extensive burn treatments that would be required, and we have disaster mortuary teams, which are teams located around the country that can assist in meeting the extraordinary burden of fatality management in a mass casualty situation. This gives you an idea of the distribution of the team just to show you how broad an
asset this is and yet locally based around the country, little known, but extraordinarily important.

Last year these teams were deployed in the field for 340 response days. Two hundred and twenty-five days of the year they were out in the field at least responding to one or up to four different disasters at the same time.

Now, the lead responsibility for definitive medical care rests with the Departments of Defense and Veterans Affairs. These resources are among existing hospitals that volunteer to participate in the national disaster medical system, and there are 2,000 such hospitals around the country offering as many as 100,000 beds in the system ranging everywhere from specialty beds to general medical-surgical beds. These are coordinated from 60 or 70 coordinating centers around the country, and it means that at any one time within a 24-hour notice we could move patients from one part of the country to another part of the country into beds that are committed in this system. To give you an idea of where these coordinating centers are located, you can see they are in all of the population concentrations in the United States, including Alaska and Hawaii.

Now, during the change of millennium and during the exercise that I think many of you are familiar with called top off, it became patently clear that we truly have a capacity problem in terms of being able to take care of mass casualties in the United States. This has been said very directly and alluded to on multiple occasions now throughout this conference, and in particular by some of my colleagues who spoke before me.

And I want to really express my great appreciation both to the center and to the American Hospital Association for their efforts to try to join with us in addressing some of these critical needs that we have. For example, during top off, an exercise that was held just a few months ago both in New Hampshire and in Colorado, it became clear that very rapidly should any kind of significant biological weapons release occur, that we would overwhelm the local hospital system. The demand that would be placed on that hospital system in that local area would be so substantial that it would essentially paralyze the ability of that locality to be able to offer health care services.

Now, recently there have -- well, not so recently. Over the last few years, there have been several studies that have been published, and I’m extrapolating from a study that was published by Kaufman and Meltzer, and I’d be glad to give you the reference if you’d like or the address on the web, to be able to reference some of the projections of requirements that would exist for the health care delivery system should we be faced, for example, with an anthrax attack. And we’ve extrapolated the data from that study and said if you were a metropolis of about 500,000 people like Washington, D.C. is and you had about 3,000 hospital beds available, which is about what we have on the average in cities of this size around the country, the number of potential cases from the release of a line source of anthrax could be as much as 250,000 casualties or people exposed, and out of that, we might have as many as 150,000 potential casualties or deaths occurring from the release of that anthrax. Now, if that should occur, just imagine the demand, the immediate demand that’s going to be placed on the health care delivery system that will be so overwhelming that it will paralyze that system.
Now, what we are trying to do is look at the options that are available for the health care systems to be able to respond, and part of that work is being done through what I will describe in a moment, which is our metropolitan medical response system planning efforts around the country and in the largest metropolitan areas.

But there are fundamentally three basic options of being able to expand capacity, and you can talk about a lot of different scenarios, and you can talk about a lot of different details, but when you boil them down, there are basically three ways of being able to approach these problems. One is to expand local capacity through the addition of alternate sites for care. Normally as an adjunct to an existing hospital so that the patterns of referral can be maintained, but as was cited earlier, the major problem, as Jim Bentley mentioned, is going to be the work force. It's not just going to be the facilities and the equipment. It's also going to be the work force.

Our second major alternative is home care, and this is something that really has to be looked at very seriously: how we might be able to adapt to a home care scenario in the event that we had mass casualties of the kinds that we're talking about with a bioweapons attack.

And the third is evacuating patients. Now, this has been a solution that works well when you have an isolated disaster and you can move people from a place of relative scarcity of resources to a place of plenty, but the challenge, again, in all of these instances is going to be adequate numbers of health professionals.

Now, one of the things that's happened to us is that in our exercises, and I'm going to just put on a few more slides, is that we have concluded all of our major national exercises within a couple of days after the release of one of these weapons so that it never has really demonstrated the stress that's going to be placed on our health care delivery system, overwhelming it and potentially paralyzing it. So one of the things that we're doing now is we are working with cities around the country to develop metropolitan medical response systems. It's not just cities. It's the surrounding counties and jurisdictions that can join together and develop a plan locally for being able to deal with the health care consequences of the release of a chemical or biological weapon. And to give you an idea of the breadth of the approaches that have been taken is this is a representation of the cities and metropolitan areas around the country we're hoping eventually that we can get to 200 cities. If we get to a little over 100 cities, we will have covered a population of about 150 million Americans. If we can go to 200 cities, we will have covered the vast majority of Americans, except those living in essentially rural areas. And what we expect will happen, what we are really trying to accomplish with this effort through our office and the national disaster medical system is to be able to bring communities together at the local level, parts of the local governance structure that haven't worked together before, and that is to really bring together our first responders, our law enforcement communities, our emergency management communities, our public health communities, and our medical and mental health service communities, to sit together and plan how a comprehensive response to one of these attacks might
actually be organized and occur and how the extraordinary health care demands might be able to be met if one of these events ever should occur.

Thank you very much.
(Applause.)

Major General Bruce Lawlor

Department of Defense: Supporting the Health Care System

Good afternoon, ladies and gentlemen. I'd first of all like to thank Johns Hopkins for inviting me here to speak. I want you to know I make this presentation with some trepidation. Everybody else on this panel has got an M.D. after their name, and I'm up here as a simple soldier. I'd like to tell you though that before I came to the Joint Task Force, I was at the Pentagon, and for those of you who are at the Pentagon, you know today that there's a great deal of construction going on out there. They're basically gutting the building, revising it, revamping it, a tremendous construction project, and I had a great deal to do with that. About a year ago when I was there, I was walking down the stairways, and there was a bottle there, and I thought, "Well, someone's going to get hurt," and so I picked that bottle up and out popped a genie.

(Laughter.)

The genie looked at me, and this being an era of constrained resources, said to me, "I'm going to give you one wish."

(Laughter.)

And I looked around at this ratty, old Pentagon building that was built in a hurry in about six months during the war, World War II, and I said, "You know, you have a tremendous number of Americans working here doing tremendous work for the country, sacrificing, working long hours, trying to protect our liberties and our freedoms. Why don't you, Mr. Genie, build a new, revised Pentagon? Make this place a decent place to work." And the genie looked at me and he said, "Are you nuts?"

(Laughter.)

MAJ.GEN. LAWLOR: He said, "Do you realize the amount of the environmental impact statement that will have to be written, the amount of money that the Congress is going to have to appropriate, the technological and engineering feat that this would require?" And I confess I thought about that a little bit, and it was kind of overpowering, and so I said to the genie, I said, "Well, okay. Instead of that, why don't you make me an
interesting and dynamic public speaker?" And the genie says, "We can take this probably and do it in sections, and we can get the Congress" --

(Laughter and applause.)

MAJ. GEN. LAWLOR: So with that preface, let me move quickly through some thoughts that I would like to offer for your consideration. I'd like to talk a little bit about who we are as a Joint Task Force, and then give you some thoughts about some of the things that we're thinking about and hopefully invite you to think about them with us.

I command a Joint Task Force that's stationed at Fort Monroe, which means that it is composed of Army, Navy, Marine Corps, Naval personnel. I have some Coast Guard personnel. We have some police officers that work with us. Admiral Knouss has been kind enough to help us out with one of his people. And what we do is we think about this problem all the time. I mean that's the only mission we have is to think about how would we as a defense organization, as a Department of Defense, try to assist state and locals if we were asked to do so and we were given or ordered to be in support of another lead federal agency.

Now, it's been discussed as I've been here today the federal response plan, in which there are 12 emergency support functions that have to be performed in the event of a disaster. My organization has the mission from the DOD perspective of trying to support every one of those 12 organizations if they need us, and so really what we do is we try to think about ways that we can take DOD assets and, based upon the requirements that other federal agencies identify for us, we try to see if we can help and fill those requirements.

We adhere very carefully to five principles that the Secretary of Defense has promulgated, and I'd like to mention them briefly for you because I think they're very important, and it helps to focus what we do in people's minds. The first is that we are always in support of another lead federal agency. The Department of Defense is not in charge at an incident site. We are not in charge, frankly, of anything at the incident site. We will take instructions from the lead federal agency. In most cases it will be the Federal Emergency Management Agency or it can be the Department of Health or Health and Human Services.

We will take our instructions from them in terms of what we are to do and the priorities that we are to do them in. And so we are never in charge of anything within the United States. And part of the reasons for this is that we believe that the use of federal forces, federal troops within the United States is a very serious thing, and these principles that we adhere to are designed to insure that it is done only with the greatest of care.

The second thing that we have working for us is a very shortened chain of command. I report to the Commander in Chief of Joint Forces Command, a four-star General Kernan, and he in turn reports directly to the Secretary of Defense, and what that means is that we have civilian oversight very closely watching everything we do. Within the
Secretary of Defense's Office, there has been a special office created, an Assistant to the Secretary of Defense for Civil Support, headed up by Ms. Pam Burkowski, and her job is to provide day-to-day supervision and oversight of everything we do, and that includes procedures and plans and actual operations.

Thirdly is that we have been specifically charged to conduct all of our operations in conformity with state, local, and federal law. Now, that seems like it's obvious. It seemed obvious to me when I first got this job. It seemed obvious to many Americans until about two weeks ago when we learned about Palm Beach in Florida, and now we understand that sometimes it is more complex to try to figure out just what the rules of the game are because there are state rules and there are local rules and there are federal rules, and someone has to make the decision on how to integrate all of those rules. So we do that.

The third thing that the Secretary has stated is that the primary mission of the Department of Defense is to fight and win the nation's wars, and what that really means is that we are not reorganizing ourselves in order to accept this particular mission. What we do is we look at the existing capabilities within the department, the war fight capabilities, if you will, and try to tailor them so that they will assist if we are asked to do so.

And the final thing that we're doing at the JTF based on the Secretary's guidance is to involve the National Guard in the forefront of the DOD's response efforts because they are connected to the states and to the communities. So that's a little bit about who we are and what we're doing. And now I'd like to talk a little bit about the bioterrorism problem and give you some thoughts that we see from our perspective.

How you define this problem is very important because the definition of the problem oftentimes will set the parameters of your solutions, and we think that perhaps defining the problem as a medical problem or even a public health problem may not be the best solution because there are a variety of areas that impact this response as we see it and as we see ourselves involved in it.

Now, first of course is the medical response, and you've all heard about the overwhelming requirement for assistance in the event of a catastrophic CBRNE, chemical, biological, radiological and nuclear high yield explosive incident within the United States. DOD can help, but in order to help, we have to be careful in terms of our planning or you will find that the assistance that we can provide will not be as immediate as you would like to see it and may not be in the quantity that you like to see it, and there are three reasons for that, and I'll talk about them very briefly.

The first is the force structure itself. The Department of Defense has been going through a downsizing exercise since about 1990. To give you an idea, to tell you about the Army which is what I know the best, since approximately 1990 the Army has been reduced by 40 percent, and so the force structure itself is no longer there. And what has happened is because the primary mission of the Army and all the services is to fight and win the
nation’s war, there has been a focus to make sure that the tip of the spear is sharp, and in order to do that, sometimes you sacrifice some of the support requirements or the supporting units that you have, and unfortunately those supporting units are the very units that probably would be needed in the event of one of these domestic incidents. And so many of our hospitals are now clinics, and many of our clinics no longer exist. We rely extensively on the civilian medical community for health care throughout the military, and those assets simply are not deployable. So that’s one of the issues.

More importantly though is the issue of our culture. Our medical system is designed to establish medical facilities at the edge of the battlefield and then echelon their way to the rear areas with each succeeding echelon providing more definitive care, and our strategy has always been to stabilize and evacuate. I think Admiral Knouss talked about it, to take the patient away from the danger area and transport him or her to some area some distance away in order to provide definitive care. That is contrary to what we are thinking about here. Here we’re talking about the need to bring medical care, definitive medical care, to the actual incident site, to the danger zone, and that’s contrary to the way DOD does business. And so we’re rethinking that process. How do we go about doing that? And trying to figure out how we organize ourselves.

The final reason is our force structure. Our force structure is designed to operate in a very austere environment and to be self-sufficient, and so what you get when you get an Army mobile surgical hospital, for example, is a series of skills, skill sets, doctors of different kinds having different types of degrees and skills, nursing with different skills.

You also get the infrastructure that’s needed to support that facility because the unit is designed not to operate in the suburbs of Cleveland or Baltimore or Los Angeles, wherever. The unit is designed to operate in the austere environment like the Saudi desert. And so when I ship one of those units somewhere, I’m not shipping just people and medicines. I’m shipping beds, blankets, medical equipment, the kitchens, all of the facilities that’s needed to support this unit in an austere environment.

And so how do we look at this? We think that perhaps a way to approach it is that we need to start defining the type of care that’s needed over time as the crisis develops. What is the type of care that the health care community prognosticates that we’re going to be required at certain times as the crisis develops and winds down? And then once we’ve made that decision, we need to begin to look at what are the specific kinds of skill sets that you need and medicines that you require, and let’s bring those skill sets and medicines to the site without moving the rest of the infrastructure.

I can move knowledge, and I can move medicines a heck of a lot faster than I can move cots and kitchen equipment. It takes literally days to move and set up an Army facility, whereas it takes hours to move some personnel and some medicines. And so we’re looking at conversion models where we can take what we have by way of medical care and use the existing infrastructures within the communities, hopefully located somewhere very near an existing hospital because we believe that people are going to self-evacuate to the places they know. So if we can somehow figure out a way to use
existing facilities on the ground at the hospital site or near the hospital site to bring our care, we think we can respond quite rapidly.

Another area that I would ask you to think about, and I'll close this down quickly, is the psychological impact that a CVRNE event will have in the Untied States. Recently the Journal of the American Medical Association had a series of articles that talked about the kinds of things in America that people are expected to experience if one of these events occur, and it sort of has a scale of greater need or greater problems for us. We talk about helplessness and hopelessness, and then it starts to change, and you see anger. You see panic. You see violence. You see riot, and the problem becomes in order to provide definitive health care, in order to bring these services to a community, we first have to stabilize the community itself. So I’d ask you to think about as you think about the entire medical care problem, to think about stabilizing the psychological environment within the community because for us to do our jobs, for the community to do its job, we first have to make sure that we have a safe environment in which to deliver these services. So that is an important issue.

Finally, let me talk to you a little bit about the political issues that we see because they are very, very important and very critical to us as folks that are attempting to assist. We're not going to make any of these decisions, but we need to have these decisions made by our political leadership. And one of the things that we have seen in the exercises that we’ve been a part of is a noticeable lack of participation in some cases by the political leadership in the really important decisions that have to be made. For example, limited medicines. Who gets it? What's the priority? How are you going to put a program on the ground that will be understandable and that will not cause the very kinds of psychological problems that we're concerned about occurring in one of these incidents? It's a prioritization issue. Who gets the shots, which is another way of saying who doesn't get them? And that's very important. Which parts of the city will we first be directed to try to provide care for? We've run some exercises where you begin to see natural divisions begin to emerge, rich versus poor, black versus white, and these are the kinds of difficult, difficult political decisions that we have to begin to decide how we're going to handle.

The care of our deceased. How do we care for large numbers of deceased? We've been looking at this. One of the things that we know within DOD is that we no longer have the capacity to provide that kind of service because that, too, has been downsized, and so how do we, if we are confronted with the death, let's say, of five, 6,000 people, how do we process that? How do we process the remains in a way that's dignified and respectful? That's not an easy decision because it not only is a decision in terms of priority, it's a decision that involves religious beliefs, the beliefs concerning evidentiary collection, licensing problems, and it's a very difficult issue that we need to also address.

The final thing I’d like to talk to you about, and I’ll leave you with this thought, is the issue of quarantine. We hear a lot about the question of quarantine, and we think that's also a health care issue that the health care community really needs to think about because quarantine in our judgment -- and we've looked at that -- has an enormous
number of problems associated with it because once you isolate a person, you have assumed responsibility for that person's care and feeding and warmth and shelter, and all of the things that that person is required to have in order to survive.

And I would leave you finally with my friend Bubba. Now, I love Bubba. Bubba is in my imagination a hard working American, loves his family, loves his country, loves his God, and he'll give you the shirt of his back. He'll do anything he can to help, and Bubba has an ambulance, and that ambulance is a Ford F-150, and Bubba is going to do what he needs to do to help his family and to help other people.

And so when you talk about quarantine, think about Bubba and think about how far you're willing to go and who's going to enforce it because it is not a role for the Department of Defense to be doing quarantine enforcement. And the last time that I know of that quarantine was done in this kind of a situation was in Yugoslavia where the only effective way to quarantine their folks was to take over hotels and put barbed wire around them and have the military enforce it. And I have to tell you that's not the American way of doing business.

And so let me leave you with this thought. I try not to be a Chicken Little because I really don't believe in Chicken Little. This is a wonderful country. We have enormous wealth. We have great capacity. We have dedicated health care professionals, dedicated medical people, and we're going to get through this thing, just like we've gotten through every other challenge in the last 225 years. We'll get through this one.

Thank you.
(Applause.)

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Ambassador Richard Butler

International Leadership in the Control of Biological Weapons

DR. O’TOOLE: I hope you were enjoying the conversation at dinner. I am Tara O’Toole from the Johns Hopkins Center for Civilian Biodefense Studies. And it is my great honor to introduce our evening speaker. Ambassador Richard Butler is entitled to call himself a citizen of the world in view of his distinguished career spent in pursuit of peace and worldwide disarmament. He was, in fact, born in Australia and is a permanent resident of the United States. He has held many important posts in Australia's Foreign Service, including Ambassador to Thailand, Ambassador to Cambodia where he was deeply involved in negotiation of the Cambodian Peace Agreements. He represented Australia to the International Atomic Energy Agency and in 1983 was appointed Australia's first Ambassador for Disarmament. He led the Canberra Commission on the Elimination of Nuclear Weapons and in 1996 managed the U.N.’s adoption of the Comprehensive Test Ban Treaty.
For a change of pace from weapons of mass destruction, he was in 1994 president of the Economic and Social Council of the U.N. and in this role he established the Global AIDS Program, U.N. AIDS. He tells me that in his view immunology is to public health as arms control is to international peace and security. He also served for five years as Australia's permanent Ambassador to the U.N. and of course from 1997 to 1999, he held the formidably serious post of Executive Director of the U.N. Special Commission charged with disarmament of Iraq. He is the author of The Greatest Threat, Iraq, Weapons of Mass Destruction and The Crisis of Global Security which was published this year. Please welcome Ambassador Richard Butler.

(Applause.)

AMBASSADOR BUTLER: Tara, thank you very much for that very kind and generous introduction and beyond that, thanks to the great Johns Hopkins University for holding this meeting, the second of them, on this vital subject and for giving me the great honor of being here and being able to take part in your proceedings.

The subject I've been asked to talk about is international control of biological weapons and I guess in some ways that's appropriate because I've spent over a quarter of a century of my professional career involved in international efforts to control and reduce weapons of mass destruction. But I do have to enter this disclaimer as I start my remarks. I am not a biologist. I hope you won't hold that against me. As I glitteringly display to you my ignorance of the subject that I think probably 99.9 percent of you in this room are the experts at, please forgive me. My claim, my reason for accepting this invitation is because I deeply believe in the business of controlling weapons of mass destruction and I know enough about their biological expression, biological weapons, to know that they constitute the greatest threat to us that is visible today and will be with us for some time. And when I was asked, therefore, would I come to this truly important conference and talk about the international aspects of controlling biological weapons I set aside -- I actually as the organizers can tell you, in my first response I asked, are you sure? Don't you want a real biologist? And they said no, we want you to talk about what you've done and where you've been. And I said well, because your cause is just and the subject is so crucial, I'll have a shot at it. That's my extended apology and introduction. You're all now suitably primed. The bar has been set really low --

(Laughter.)

-- and I can just relax and say whatever is on this piece -- I use graph paper because this is a scientific meeting, right?

(Laughter and applause.)

So I'll tell you what I'm going to do. Those are notes. It's not a set speech. I'm going to open my heart to you and tell you some really true stuff that I believe to be true and I know from personal experience and I'm going to chance with you and it's my gift and tribute to you because of who you are and what you're doing. I'm going to chance with
you for the first time anywhere some ideas that I've been working on, on how we might try and cut this terrible knot that we face with respect to the biological weapons convention and when I've finished having my shot at it, I believe we will be able to have at least a brief period of discussion and I would welcome that.

So as I said, I'll start by opening my heart by telling you a true story from my time in Iraq. Because this story, apart from being interesting, has got in it some of the key elements and problems that you and we are all dealing with, with respect to biological weapons. The subject of this story is Iraq and its biological weapons program. It starts in 1991 when the Security Council after Iraq's ejection from Kuwait, when the Security Council simply required that Iraq have taken away from it any biological weapons it had created and the means to make them, the language in Resolution 687 which is law, it's international law under Article 25 of the charter, the language was that these things must be and I quote, "destroyed, removed or rendered harmless." And what was specified was all biological weapons, other weapons as well, chemical and nuclear, but I'm talking about biology, all biological weapons, all places where they were made and all means and materials used in their manufacture.

To make this possible, the first step was that Iraq was required to give declarations to the Special Commission that the Council had created to carry out the work of disarming Iraq, the Commission that I came to head. Those declarations were the first of a three part step that was to bring about the destruction, removal or rendering harmless of Iraq's illegal weapons. Declarations, verification, and destruction. So the declarations were crucial and bear this in mind as you consider your wider subject.

Declarations, crucial. Fundamental facts are required. And the cooperation in this case of the State concerned was required because they alone could author those declarations. Now what Iraq did from the beginning was it entered an utterly false declaration. Quite simply, Iraq from the beginning said, "what biological weapons?"

(Laughter.)

We have none. There was one piece of paper in pencil in Arabic that referred in passing to some relevant research. But their declared stance was that they had no biological weapons.

We pursued them for four years, increasingly confronting them with evidence to the contrary and it took four years before they moved to their second position which was to say, "oops, we lied."

(Laughter.)

"We did have some biological weapons, but we fall on our swords. We put our hand on the Koran and tell you, none of this was offensive. This was an entirely defensive biological weapons program."
Before I leave here tonight, I want someone to solve a problem I've had the last few years, that I've had deeply. Please explain to me what in the name of God is a defensive biological weapons program?

(Laughter.)

So we said. "okay, you've got a defensive biological weapons program. Give us a declaration on it." And they did. And they gave us a document which then in the subsequent four years we asked them repeatedly to clarify it, to improve it, to add to it, to make sense of it because it was utterly without meaning. It was internally contradictory. We discovered some documents on a chicken farm in 1995, believe it or not, they call them the chicken farm documents. One million pages of them. You know, from that guy who took that ungifted decision of running away to Jordan, he happened to be married to Saddam's daughter. He ran away to Jordan and after a few months accepted the statement that all is forgiven, come home.

(Laughter.)

He had a chicken farm and he was also in charge of the WMD program and there was a million pages of documents at that farm and we got hold of them and we learned more about their biology program and by the time I was pursuing them vigorously on the biology issue, I kept saying to Mr. Terik Aziz (Phonetic.), the Deputy President of Iraq whom the great man had put in charge of the anti-UNSCOM industry. It was the second largest ministry in the government of Iraq, the first being the Minister of Defense. And I started to pursue Aziz about this declaration saying that it was so unconvincing and he then started to argue with us saying we were overly fastidious, we didn't accept their statement that it was merely a defensive program and it hadn't been very sophisticated. One of the documents they gave us to prove that it hadn't been very sophisticated was a document that showed how few PhDs in biology they had in Iraq and that proved that it couldn't have been a serious biological weapons program and so on.

Now I'm wasting time.

(Laughter.)

I just get fascinated by this stuff. I mean it's just -- does anyone -- it's like a Fish Called Wanda, you know? It's like that.

(Laughter.)

The Monty Python Show.

(Laughter.)

So I said all right, you don't take my word for it. We'll submit your declaration to study by international experts and we did that on four occasions under my watch. Four times.
We put the Iraqi biological weapons declaration to international study and four times these experts reported to us that it wasn't worth the paper it was written on. To be quite specific, they said Iraq's declaration on its biological weapons program does not form an acceptable basis for verification. That's the jargon we use. There was no way that we could verify in any acceptable way the nature, size of their biological program. But through our own resources we were able to establish that they made the whole range of BW agents, that they had weaponized them, including putting them into missile warheads. They had even gone into fields, the rationale for which was inexplicable in battlefield terms and I'm thinking in particular of aflatoxin. But I think we now have some sense of why they were making aflatoxin, because people in the south of Iraq and I gather, I hope Christine Goslin won't mind me mentioning her from Liverpool University, who's second to none in this world in looking into what Saddam has done in the north of Iraq. There is evidence of growing rates and disturbingly high rates of liver cancer in population areas in Iraq that don't favor Saddam. So it would appear, the implication is that there was a purpose to aflatoxin and it was genocidal. But they made the whole range of biological warfare agents and we have reason to think, partly through Dr. Goslin's work, probably used some of them at least internally in Iraq. We had evidence that I presented to Terik Aziz (Phonetic.) of him testing of biological weapons, possibly on Iranian prisoners that they took after the Iran-Iraq war.

And then finally, two things to wrap up the Iraq portion of my remarks. Finally, on an exquisite occasion in Baghdad -- is that an oxymoron? No. On an exquisite occasion in Baghdad, Terik Aziz (Phonetic.) opened his heart to me and I'll tell you frankly exactly how it happened. I had become so thoroughly sick and tired of the bullying and the heckling that had taken place in a meeting that had been taking place in formal circumstances, that when he asked me personally, just the two of us, to have coffee afterwards, I decided I didn't want any more of that, so I chanced my arm by saying tell me, wise man, tell me, great man, your impressions of the region. How are the politics in the Middle East? Tell me what you think about things? And he loved it. And he did. He told me what he thought about all matter of things. And some of it was chilling, but above all this, this man who had lied to the world for four years about Iraq's biological weapons program and I had said to him across the table on one occasion, you, Deputy Prime Minister, lied to the Security Council. You lied around the world when you said Iraq had no biological weapons program. To which, as an aside, he said well, that was a mistake, meaning not the lie, but that they got caught.

This man had lied in that fashion. In private, in private, he said to me, of course, we made biological weapons and this is in my book, so I'm not spilling this out of school as it were. He said of course we made biological weapons. He said we made it in order to deal with the Jews. That's what he said in private. I know that sounds dreadfully anti-Semitic and of course, they are. But for those of you in this audience who would take that extremely personally and I certainly took the deepest offense at it, let me also point out to you that he also used the ethnic name for the Iranians, at all stages called them Persians. You see, Terik Aziz (Phonetic.) can't use the political terminology for the State of Israel. He has to call them the Jews. And he can't use the term Iranians. He has to call them the Persians. At all times, ethnocentric in approach.
And he told me that yes, of course, we had made biological weapons and we made them in order to use on the Jews. I was then supposed to forget that when we went back into formal session outside that room, when he would go back to saying what biological weapons?

(Laughter.)

Now, finally, on the 8th of August 1998, when everything came to an end with UNSCOM, it did so after I had made an extraordinary and new offer to him in order to bring to account all of the existing WMD systems of Iraq including biology and the most extraordinary part of my offer had been in biology. I had said to him, I propose to leap across the place where we've been stuck for years trying to work from the bottom up to account for the amount of gross media that you imported from outside, to account for the manufacturing processes you used, the filling of various munitions and so on, where we had been stuck in a quagmire of argument about how much media, what facilities, etcetera. I said I propose to leap over that as we try to bring the period of the disarmament of Iraq to a close. I said here's my deal. Give me the finished weapons. Give me the munitions and the warheads that have been filled with biological agent and the evidence I need that says that's all there is, and I will destroy, remove or render harmless those weapons. After all, it's weapons that we're principally concerned about and I will tell the Security Council that we're done with the weapons of the past and provided we can then maintain the monitoring system to see that you don't make more of them in the future, I'll be prepared to include that in the final disarmament account for Iraq.

And he was very interested in that. He said, but when on the 8th of August 1998 they put their final demand on me to declare Iraq disarmed, or else, and I across the table utterly refused. I said I will not because I cannot because you haven't given me the materials I need to do so. The key thing that he had not given me was an answer to that proposal. The key weapons category that I discerned by their level of deception that they wanted to retain was biology. They've retained their no how in the nuclear field. They retained a certain quantum of chemical weapons. I know that. And they were already beginning to rebuild their missile capability. I took that up with them and they told me to get lost. And that's all now established, absent inspection for the last two years. They're back on track in all weapons areas. But if you judge a person by their behavior, rather than their language and if I look very carefully at what Iraq did in those closing, difficult days of 1998, I am bound in logic to conclude that the area of weaponry that Saddam Hussein was most desperate to protect from us was biological weapons, that this is his weapon of choice. His retention of that capability is what he was prepared to trade off against the welfare of 22 million ordinary Iraqis, I mean the lifting of sanctions which would have followed had I been able to do what I proposed, that is, get the extant biological weapons off them and destroy them. The evidence of their behavior is a deep attachment to biological weapons.

Now the Iraq case is important because Saddam Hussein's persistent addiction to weapons of mass destruction, his track record of using them makes him a singular
character in the contemporary world. And the thing that has to be highlighted in this context in terms of now as I move to talking about international control is that he has done what he has done in the development of weapons of mass destruction from within the arms control regimes. He was a few months away and some now say no months at all that he had, in fact, developed an atomic, nuclear explosive device, but I believe he was a few months away from successfully completing a nuclear explosive device when we intervened. This was done while Iraq was a member of the Nuclear Nonproliferation Treaty. He developed his biological weapons capacity while a signatory to the Biological Weapons Convention. Because it's more recent in time, Iraq is not a party to the Chemical Weapons Convention, but it was a party to the 1925 Geneva Protocol and was instructed by the Security Council, under law to join the Chemical Weapons Convention, yet Iraq developed chemical weapons. And this case is therefore a serious one because of its special features that I've just enumerated as we look at the business of international control on biological weapons. And there are lessons that can be learned from this case.

Now turning to international control. I envisage two approaches towards control of biological weapons. One is from the top down and the other is from the ground or the bottom up. You must think I'm deeply attached to bottoms up or something because this is the second time that I will have mentioned that.

The top down is actually almost exclusively international in character and what I'm talking about-- sorry, it's almost exclusively international and it certainly is substantially in the public sector. The bottom up approach is much more significantly national, but can be the subject of international standards and it is very substantially carried out in the private sector.

Now I'm going to illustrate what I mean. The top down approach is what we have on the whole today with one notable exception, that of enforcement, but I'll come to that. The top down approach is the classic way in which for the last almost half century, remember Allamagordo (Phonetic.) was in July 1945 and it was the beginning of the modern period of weapons of mass destruction. And in January 1946, the United States made the first proposals, the Baruk (Phonetic.) Plan to the United Nations for the control of atomic weapons. So we've been going now for about 50 years in this vein, designing top down, international approaches to the control of weapons of mass destruction.

And they have these characteristics: first of all, the establishment of a global norm. That's point one, a norm. A simple norm that says this weapon is inadmissible in civilized society, expressed in various ways, but essentially that the creation, use, deployment, transfer to others, etcetera of the weapon in question is inadmissible. That's the norm you find in the NPT. It's the norm you find in the CWC and in the BWC.

Secondly, the creation of a commitment, typically in the form of a treaty or a convention, same thing, a contract, if you like, but they call it a treaty or a convention, a political commitment to give effect to that norm. It's simple. You establish the norm. The next question that leaps off the page is well, how do you give effect to that norm? The answer
is you invite nation states to sign up, to sign the treaty and say we will never possess, make, use or transfer to others this inadmissible weapon. But then the next question that also leaps off the page, the question and I can tell you for all my years in arms control negotiations is the second most important question. I’ll come to the first most important question in a moment. The second most important question, the one that immediately follows as soon as you start to negotiate a treaty is how will we know if everyone is keeping that commitment? In other words, by what means will we verify that commitment made in a treaty to the norm that is the fundament of that treaty. So it’s a three-legged stool. Norm, commitment, verification. And typically, a means of verification is drawn up which involves an organization, inspectors, reports, declarations and so on. So the treaty partners can see that those who have entered into this commitment are keeping the commitment and it is believed that when all see that this is happening, that a climate of confidence will be established and will grow as each day passes where reports come in saying nothing happened. That's the toughest business about being in disarmament. The best news is no news and you can't get anyone to write about it or talk about it on television to say that guess what, nothing happened under the NPT this year. No one is going to write that story. But that's the best news. Like a couple of people I spoke with with drinks here tonight who had been down in Sydney for the Olympics from the standpoint of possible biological terrorism there and nothing happened and I said well, you succeeded. And they deserve applause for that. But no one was told that because that's the nature of arms control verification and measures.

Now the first most important question that follows from this three legged structure and it's the most difficult one of all and it's one that I will emphasize greatly in the next few minutes, it's the missing one, is enforcement which would turn this three legged stool into a much more solid four legged table of norm, commitment, verification and then in the event that means of verification show or other means show that a treaty partner, like Saddam, is cheating from within, is breaking the law, then there needs to be an assured credible means of enforcing commitment to the treaty. And it is the absence of that which is in my opinion one of the most serious deficiencies into today's structure of control of weapons of mass destruction and in the case of the Biological Weapons Convention, we don't have either that fourth leg or the third leg. We don't yet have an adequate means of verification of the commitments that some 140 States have now made under that convention, let alone any reliable predictable means of enforcement in the event of an infraction such as the flagrant infraction that has been committed for over a decade now by Iraq.

I will return in a minute for what this means and what my first time in public proposals are, but first, I'll just talk quickly about the other approach which is from the floor up, the bottom up approach that is necessary to future biological weapons control.

You know this better than I do because this is the field where most of you work. These are the things I said that are largely in the private sector and they're largely within nations. And I will mention four key loci, key points where control needs to be developed and maintained. It is already in existence in good measure in countries like
this great country. I don't know whether it exists in Florida. I had to say Florida sometime.

(Laughter.)

The first of these key points is the points where there are decisions taken by individuals about access to the knowledge of how to make biological weapons, whether that's in universities, research establishments, on the internet. What I'm going to say here is very far reaching stuff and deeply appreciate that, but I've got say it. One of the key barriers to making any weapons of mass destruction is that if you don't have the knowledge, then you can't do it. So there are key places in domestic society in this and in other countries at which decisions are taken on who will have access to the knowledge. That's the first locus of control.

The second, the same principle applies with access to the materials. There are key places where the materials required exist and decisions are taken as to who has access to them. And this is a big problem because as you all know very well one can order dried anthrax spores on the internet today, if you've got what a university accreditation number or whatever, something like that. Now these are key places where -- was that not true? You're laughing at that. Isn't that true? From the Maryland Laboratory, just up the road, right, good. Give me their address later.

(Laughter.)

Now there are also key decisions and this is really tough. There are key decisions taken by people in the economy with bearing on who gets access to the relevant materials and knowledge. And their decisions could well be taken solely on that ground, that if we sell this process or this technology, this, I believe, will be increasingly the case in the future where the processes involved are potentially very expensive or great earners of revenue, that there will be significant temptation to simply sell the process in order to make money. These are key points at which control needs to be established.

And finally, there are the points at which decisions are taken by politicians or leading or decision makers in the military on whether or not biological weapons should be created or held in reserve or transferred to others, etcetera. Now, those decisions lie far beneath the overarching norm in international structure that I was describing a moment ago with the possible exception of the last category of decisions by politicians and leaders of the military, they're all largely in private hands. This is something that challenges us more deeply with biological weapons than with any other field. They make biological weapons control vastly -- sorry, I'll put it the other way around. The order of difficulty involved here makes nuclear weapons control seem like a piece of cake in comparison to biological weapons control. But any serious system of control of the proliferation of biological weapons within a given country and therefore under the purview of any compliance system under a treaty and therefore internationally would actually have to include control at those points in decision with respect to knowledge, materials, economy and national, political and defense related decisions.
Now these latter are deeply complex, but I'll just say one sentence about them. They require us in the future to completely abandon the line of distinction that has previously existed between what is the duty and role of the public sector, the government, through treaties and so on with respect to controlling a dangerous substance, in this case, biological weapons. And the role and responsibilities of the private sector. They cannot be as conveniently compartmentalized as they were in the past with respect to some other weapons. Any sensible regime of control in the future will have to see virtually co-equal participation by government and private sector, if we're going to have a snowball's chance in hell of getting this difficult job done.

My subject has been international control, principally, so I'll return to that. But it has bearing on domestic control and now I'm going top ut to you my new thoughts. Seven key requirements, seven things I think are required if we're going to have a chance of defeating this demon of the potential spread of biological weapons, both in State hands and in non-State, in other words, terrorist hands.

First, the norm that these weapons should exist nowhere needs to be strengthened. It is stated fairly unambiguously in the biological weapons convention and elsewhere, but I believe it needs to be strengthened and stated more sharply, and I specifically propose that the position of biological weapons or action unambiguously designed to produce them should be categorized as a crime against humanity.

Secondly, and this has consequences that we may wish to discuss. I doubt that anybody in this room would challenge the assertion that I've made in substance, these weapons are in and of themselves a crime against humanity. What conceivable human purpose can biological weapons serve? The point I'm making by saying that they should be listed amongst the crimes against humanity of which genocide is one that is to set up the following circumstances. Secondly, this would then enable the community of nations to conduct themselves accordingly. When it became clear to that community that a State or a non-State group was seeking possession of those weapons or had them, there would be complete justification for taking whatever action was necessary to remove those weapons. That implies that fourth leg of the table that I mentioned, namely, reliable enforcement and that's my third point.

There must be developed consistent, credible, reliable enforcement of the norm that says no person should have biological weapons. And that means, if necessary, by military means. And what I am proposing -- although I strongly doubt that if what I am proposing were accepted, if this were a norm that the possession of those weapons were a crime against humanity, that the nations of the world were unified in that purpose and it was credible that when they were faced with an infraction, a crime against humanity, they would take whatever action was necessary to deal with it, I doubt that would almost ever have to be military action, but it should be there if required.

My fourth point is that for that purpose we need to strengthen the means of verification because I've talked about credible reports of infractions of this norm, this crime against humanity and that requires urgent action better than it's been taken up to the present
time. It's presently under way in Geneva, I gather. When a new Administration takes office in this country, it requires, above all, because we are the only ones who can do it, for the United States to take up this challenge first with the Russians and then with others, to insist that this is serious. This is a crime against humanity. This norm in the treaty is real and it is a matter of great priority to develop the means of verification to show whether or not a crime is being committed or compliance is being maintained.

And my next point, I think, fifth point is that there should be a place where these reports are judged to take the heat off of an individual country like the United States and there, I propose that there should be a council like the Security Council, but in which there are no vetoes, a council of nations, the business of selecting who they are would not be such a difficulty, which sits ad hoc to receive the reports of the verifying agencies that all is sound under any given WMD Treaty. But in the case of biology, to be the place where reports and verification of compliance with the biological weapons convention are received and if like the Sydney Olympics, they're all good reports, fine, but occasionally, when they're not, the discussion and decision making could take place in that council, the Council on Biological Weapons, the Council on Weapons of Mass Destruction, if you like. Decision making could take place, including the decision to authorize the use of force to put down the infraction involved.

My next point and last, I think, seventh point, no, sixth point is that the private sector must be engaged in this, the biological weapons area more than any other, must include engagement by the private sector in maintaining the norm, in providing reports to the authorities of attempts to acquire criminally prohibited substantives and so on. And that for that purpose and this is my seventh point, relevant national law needs to be made in each case to give effect to this international obligation. So that in the United States, relevant national law with respect to the biological, brackets, crimes against humanity, brackets, convention, would be made in the Congress, requiring companies dealing in substances or knowledge related to biological weapons to report, to behave in accordance with the crimes against humanity law and to report regularly to the United States' authorities on attempts made to acquire from them prohibited substances or processes. And that under the means of verification of the treaty concerned, the BW Crimes Against Humanity Treaty, of course, some of these organizations would be the subject, periodically, under an enhanced verification system of challenge inspection or regular inspection, etcetera.

Now, is this all very heavy? You bet. Is it pie in the sky? Absolutely not. You ask yourself what's at stake here and it's a piece of cake. I'm mixing up my pies, obviously.

(Laughter.)

It's easy. It's easy in comparison with the downside. We have it in the pharmaceutical industry, an industry which is replete with poisons which we dish out in small doses because then they're good for you. But it's controlled adequately and I don't think, is there, a substantial black market or criminal market in pharmaceuticals? It can be done. is there? In the Third World, right? Or here? Well, maybe I'm wrong about that.
I believe it can be done, but I believe above all, that any sensible analysis of the costs and deficits means that we must assume, as part of our national and international life that as we move ahead into the wonders of biology and biotechnology, that we take with us this small additional cost, this small add-on that will keep us safe.

If anyone says to me that it's too complex, these tiny little kitchen size laboratories that are going to spring up all over the world doing all kinds of extraordinary things, it's just too big, it's too complex. Anyone who says that therefore we should walk away, we can't do it, we just have to see where it all lands, we'll get robust disagreement from me. I will never agree to that solution. It is better to try to get this done, even though there will be failures than to simply walk away. I think to fail to do something that is right simply because it's hard is the lousiest possible reason for failing to do something that is right. The other difficulties are well known to you, above all to you. Immensely difficult because of the ubiquitous nature and the (Inaudible) nature of the technologies involved.

The other significant difficulty in taking the high road in arms control is that it always involves some self-denial. It always does. If we were to push others to do this, we will have to do it ourselves. Talk about maintaining a capability as a deterrent would not be on, indeed a symmetrical deterrence which I think is a bogus idea would need to be addressed. And if we push others to do these things, they will extract a price from us, whether it's a financial price as the North Koreans are now charging us for not making missiles and a bomb or the Russians clearly would want compensations, politically and economically in other ways. There is some self-denial involved, but the benefits of going this route exceed the cost that we would pay. The ultimate self-denial is to throw away the over used idea and I’ve heard it all my life in arms control, not to say it explicitly, but repeatedly, is that arms control is absolutely great, terrific idea, as long as it's for the other fellow. That's the ultimate self-denial that we would have to accept.

So my answer to the problem that you set me tonight, what do we do about international control of biological weapons is outlined far too long. I apologize for that, but necessarily sketchily in what I’ve just said to you. In a nutshell it involves refusing to give up on something that is immensely complex, simply because it's hard, insisting on doing something that is right because to fail to do it could be a complete disaster. And I ask you in considering the idea of going the whole distance and calling biological weapons by their proper name which is a crime against humanity, I'm asking that we take the high route, set the bar higher, leap over all those crummy arguments that we used to have with the Iraqis about barrels of growth media. As I said to Terik Aziz (Phonetic.) forget that, just show us the weapons, that's what we want. Take that approach. Leap over, not ignore, but set a whole new context for managing the detail by going to the top and saying these things are utterly inadmissible. They constitute a crime against humanity and we will therefore do all the things that flow from that.

Thank you very much.

(Applause.)
Challenges Confronting Public Health Agencies

DR. O’TOOLE: I am very happy to introduce the first speaker, Dr. Margaret Hamburg. Dr. Hamburg is Assistant Secretary for Planning and Evaluation at the Department of Health and Human Services, where she serves as the Principal Policy Advisor to the Secretary of Health. It is in large measure through Dr. Hamburg’s leadership that HHS has come to have a place at the national security table in the federal government. She has been a strong voice and a superbly informed and thoughtful advocate for medicine and public health concerns in the highest levels of government during her tenure. Dr. Hamburg’s interest in catastrophic terrorism is well earned. When she was Commissioner of Health for New York City -- a position she served in for six years -- the World Trade Center was bombed, and she had several other adventures in her Commissioner position as well as other positions in government service, which are detailed in your folders. She’s a graduate of Harvard College and Harvard Medical School and was trained in internal medicine at the medical school that used to be called Cornell. It gives me great pleasure to introduce to you today Margaret Hamburg.

(Applause.)

DR. HAMBURG: Thank you. I appreciate that very generous introduction, and I’m very pleased to be here and have been truly stimulated by the last day’s presentations and discussions and look forward to the rest of what will be a very full and very interesting day.

I was asked to address the topic of challenges facing public health agencies. As public health agencies prepare to counter the threats posed by biological weapons, what are their competing demands and responsibilities? What resources are available? How does this new mission fit with the profession’s traditional objectives and capacities? And what, importantly, do we need to do?

There are so many in this room that have important perspectives on this topic, and I suppose that I was asked to address it because of, as Tara was saying, having served both as a local health officer and now a perspective from the federal government.

Also, as she noted, I do have a very real sense of the reality of terrorism. It's not a theoretical question, and I vividly remember the disruption, devastation, and death that occurred in association with the World Trade Center bombing. But I must say I can only be struck by how much worse that devastation and the associated morbidity and mortality would have been had it involved the covert release of a biological weapon.

Certainly, as Health Commissioner, I did have the opportunity, as Tara indicated, to grapple with a wide range of these outbreaks and epidemics, small and routine outbreaks, and much more exotic and larger outbreaks; the threat of imported disease in an international hub like New York City, the impact of newly emergent diseases ranging
from problems like cyclospora to HIV/AIDS, which I think today we tend to forget how, in some ways really novel it in fact is, it didn’t exist when I started my medical training. And as a first-year student at Harvard Medical School was sort of told matter-of-factly that, really, the future of medicine was chronic disease in the era of antibiotics and vaccines. But watching this extraordinary epidemic unfold was a large motivator in taking me out of my original career path, which was academic medicine, and actually I wanted to do neuroendocrinology and somehow found myself at a podium today talking about bioterrorism.

But certainly the experiences as a local health officer have been critically important to me as I’ve taken on a broader role in the federal efforts in addressing emerging infections and bioterrorism and the program that the Department is trying to develop, and have really come to believe that the issues that we’re addressing today are among the most central for the future, both in terms of protecting and promoting the health of individuals and communities but also in terms of our nation’s security and that of the world.

At the outset, I think I should say that my bias is to approach these issues as a continuum of infectious disease threats, both naturally occurring and intentionally caused. Bioterrorism clearly represents the extreme end of that continuum, both in terms of its potentially catastrophic consequences for health and because of the disruption and panic that it will cause. So I want to talk this morning, in the time that remains, about some of the important challenges that addressing the problem of bioterrorism places squarely before us, and some of the key areas of unfinished business, the key areas of focus today and into the future, and address them, if I can, in a sort of balanced way that recognizes the perspectives of local, state, and federal public health agencies. Addressing these challenges will be essential for local, state, and federal efforts in trying to counter the threat of bioterrorism. But addressing these challenges will also strengthen the ability of public health agencies to meet their responsibilities to respond to naturally occurring infectious disease threats, both routine and extraordinary.

I believe that the first challenge remains communicating the importance of the threat and the unique and critical roles of public health agencies in concert with the medical and scientific community. Yesterday, Richard Falkenrath said that he thought we should put the era of consciousness raising behind us and get on with the business of actually doing things. Well, I certainly agree that we must get on with the business of doing and not just talking, but we continue to need to get policymakers, legislators, and program planners to understand that the threat of bioterrorism is really different. They need to really understand it in the context of epidemic disease. As all of you I think clearly understand, the paradigm is different than that for conventional terrorism or a chemical or nuclear attack. It requires different investments and different partners. I wish that we could stop giving that speech. Sometimes in meetings I feel like a broken record. I wish that I could really agree with Richard that we had succeeded in that goal, but I think that we still have considerable work to do. Until the concept of what the true nature and scope of a bioterrorist event would be is fully
recognized, our nation's preparedness programs will continue to be inadequately designed. The wrong first responders will be dressed up, and we'll fail to fully build the critical infrastructure we need to detect, manage, and respond to a real bioterrorist event. The wrong research agendas will be supported, and we'll never grapple with the long-term consequence management needs that such an event would entail.

Frankly, if we look at what's been developed in the context of bioterrorism preparedness, urgent public health and medical care issues have been underdeveloped and underfunded. Of the 1.3 billion currently going into counterterrorism efforts, a very small percentage is going into the support of things that should be considered as core elements of a coherent program to address needs posed by a bioterrorist threat. The framework is there, but we need to strengthen and extend such things as ensuring a robust public health infrastructure, including surveillance and lab capacity; the pharmaceutical stockpile for civilian use; innovative approaches to expanding the capacity and flexibility of the health care system in a catastrophic crisis; and an appropriate research and development agenda -- both at the basic level of genomics pathogenesis in the human immune response as well as the development of new drugs, vaccines, and detection methodologies.

Also, a focus on prevention. As Amy Smithson pointed out yesterday, we are currently missing critical opportunities to support collaborative research efforts with former Soviet bioweaponeers and redirect their talents into pro-social, constructive, biomedical research activities; and I think as Richard Butler's talk last night underscored, the need for fuller engagement of public health and the biomedical community in designing constructive, positive strategies for non-proliferation of bioweapons.

I do think as I reflect back on experiences of recent years that there is a greater understanding and awareness of what public health is and why it's important. I think that's been stimulated by a number of recent events. Certainly, in New York City, the resurgence of tuberculosis, and the resurgence in a more frightening form of multiple drug resistant TB, changed the debate, and I saw the mobilization of a political will to address public health concerns that really had not been present before, because for the first time the potential economic impact and social impact of epidemic disease was strongly felt by critical leaders. For example, during the height of our epidemic in New York City, the correctional officers threatened to go on strike because they believed -- and not inappropriately -- that there were risks of TB communication to them working in New York City's unfortunately vast system of prisons and jails. Well, had they gone on strike, that would have been a major disaster and political crisis for City Hall, and events like that certainly helped them mobilize their attention and concern to the public health problems involved. Similarly, the headlines "Killer TB on Subways" in the York Post helped them feel that they might have some public support for putting more money into TB. But certainly that experience told us that once you could really get the issue framed in a way that was meaningful to key political leaders and policy leaders, it could mobilize the political will and ultimately the financial support to put critical programs into place. And, thankfully, in the case of TB, it wasn't a complex program. It was costly, but all things considered it wasn't that costly to put in place the kinds of appropriate measures
and effective methodologies, like directly observed therapy, that allowed us in just a few years' time to dramatically turn the tide on tuberculosis and to reduce the rates of drug-resistant TB by more than 95 percent. So it really, you know, was a very important demonstration of the effectiveness of public health.

West Nile I think was the most recent example of just how effective public health response can be and the broad ramifications, political and economic, if you don’t address it in a very straightforward and supportive way. And, of course, bioterrorism -- bioterrorism has brought public health I think into a new place at the table and gives us an opportunity to really make enormous strides forward.

So I think that the continuing first challenge, or a challenge very high on my list, is this issue of continuing the awareness about the importance of public health, and then translating that awareness into real programs.

We need to continue to emphasize the basics at the state, local, and federal level, in terms of trained epidemiologists and infectious disease specialists, surveillance capacity, including appropriate lab capacity, enhanced information technology expertise and capabilities, and improving that important working relationship between the medical community and health departments that, as Marcie Layton showed yesterday, were so essential in identifying the West Nile outbreak and the rapid response. And that, of course, is a two-way street. Physicians and the health care providers need to know what to report and to whom, and when they report they need to find a responsive health department that gives them critical feedback that affects their ability to care for patients. It is a two-way street.

And I think we also need to recognize that at every level of government there must be accountability. There's a tendency to think, let the federal government pay for this all. And certainly when I was at the local level I fell into that mode of thinking, and we spent a lot of time trying to think about ways to get more federal dollars, also how to enhance our state match for certain activities, how to get somebody else to pay for our programs. But in the final analysis, at every level of government the activities and the responsibilities of a public health agency are somewhat different, but they are critically important and we have to integrate those functions and we have to have a robust and sustainable system of funding where at every level there’s a sense of accountability, that the leadership in those communities understands the importance of the activities and is committed to funding them, and understands that if they don't they are not serving the people that elected them and put their administrations into place. And that is a continuing challenge.

Obviously, as Assistant Secretary for Planning and Evaluation, I have to stress the importance of comprehensive planning, planning at the local, state, and federal level. There will be no one size fits all plan that can be produced at the federal level and put on the shelves. It needs to be something that is done by localities and states in collaboration with the federal government. And, obviously, the specifics are unpredictable. It will
depend both on organizational systems unique to specific states and localities and also, of course, the characteristics of the pathogen involved and the circumstances of the exposure. The challenge of planning is, of course, enhanced by the fact that bioterrorism, in particular, is a low probability but high consequence event. It's often hard to engage attention because of all of the many reasons that were discussed at yesterday afternoon's panel. And it's also going to be very hard to sustain efforts into the future.

But effective strategies must build on existing systems. We don't want to develop a whole ancillary system for responding to the bioterrorist threat. We want to integrate our thinking and planning into this continuum of infectious disease threats and potential disasters. We want to not find ourselves in the situation of in a crisis trying out a plan for the very first time, but we want to try to find the systems that work in routine activities, identify what we need to do to amplify or modify them to be appropriately responsive for these more acute and catastrophic situations. For example, clearly, for many reasons, we don't want to rely on the traditional systems of surveillance. We need to be innovative and creative in our thinking about much more real-time surveillance systems that will allow us the opportunity to do that rapid detection that will lead to appropriate and effective interventions and response.

And, of course, we need to constantly be integrating new technologies as they emerge into our strategies for response. Partnerships are key, and bioterrorism obviously raises new challenges. They’ve been discussed already to some degree, but it's hard enough when we're talking about responding to infectious disease outbreaks to get the medicine and public health community to fully work together in the ways that are so critically important. So now we're talking about working with law enforcement and the intelligence community and partners that historically we haven't worked a great with and that in some ways we're not so comfortable with. But it's clearly critical to our success, and it I think is something that many communities have demonstrated effective ways of partnering, and we need to learn from them and we need to continue to work at the state and local, as well as federal level, to make sure that these partnerships are real and enduring and not just dependent on relationships that develop between individuals.

One thing that has been striking to me in my current role that really makes it hard for our department to be fully at the table in national security discussions is our inability to deal with the issue of classified documents, and our inexperience dealing in the world of security concerns. We are currently in the process of developing secure video conferencing capability, which will really allow us to have real-time communications in a crisis, or on a routine basis, with the key partners in the security community, talking about sensitive issues. But for the longest time, an enormous amount of activities went on. We were not part of those discussions. We were not at the table. And we even had a hard time obtaining a secure fax. I think as a nation we need to really think very carefully about how we classify items and the framework for security, because certainly we've had some recent experiences that tell us our systems aren't fully working. But it is clear that if we want to be true partners in this, we have to become much more sophisticated.
And at the federal level in Department of Health and Human Services, it’s hard enough, both having sharp enough elbows to be at the table in person as thinking and planning and discussions go forward, but this issue of being marginalized because of our inability to function in that world I think also needs to be addressed. And I imagine at the state and local level it’s going to be even more critical over time. Certainly, when I was Health Commissioner, the issue of having a security clearance and dealing with secure documents was just simply something that never came up. But in terms of some of the kinds of stuff that we’re thinking about now, I think, you know, we need to really look at that and address it in a much more focused way.

Controlling disease and caring for the sick will require a very full engagement of the public health and medical community. I don’t have the time now to elaborate on some of the critical points that came up yesterday with respect to the pressures on providers and the hospital community that limit their ability to prepare in some of the critical ways that we need in looking to the future and the infectious disease and bioterrorist threat. But we cannot ignore them -- the enormous downsizing that has occurred, the competitive pressures to cut costs, the just-in-time pharmaceutical supplies and staffing approaches, the limited capacity for certain specialty services -- respiratory isolation beds and burn units -- that may become critical in a biological or a burns chemical terrorist crisis needs to be recognized and addressed.

But we also, of course, have to understand the costs incurred to these institutions and individuals, and that there is enormous and upfront investments if they are truly to prepare. And in some ways, if you are institution, a health care institution in today’s society, to both make those investments is a high-risk undertaking, but then you’re also sort of setting yourself up to incur a series of costs that you don’t know whether they’ll be reimbursed or not after the crisis is over.

So I think we have to find better ways to strategically support our health care institutions, both because of the implications of a bioterrorist attack but also because of the known threats to the system in the form of routine flu seasons that are currently overwhelming our system’s capacity to respond.

So we need to really think about developing programs that may target dollars for this kind of disaster, planning and relief, providing training, providing templates for preparedness, and trying to develop strategies in collaboration with other critical partners for providing ancillary hospital support in the event of a crisis, whether it’s through the army field hospital model or going back to what was done in the 1918 pandemic flu, where you took over armories or school gymnasiums or whatever. But we need to really focus in on that. We really need to support local and state planning efforts to assess community assets and capabilities, and we need to look at what are the federal supports that can be brought to bear in a crisis.

I’ve gone overtime, but I have to mention we still have an array of legal issues that are unaddressed, and we talk about that more in the next panel. But it ranges from such basic ones as the issue of declaration of emergency -- what are the existing authorities?
Are they public health, or do they rest in other domains that will be relevant? What are the authorities that still need to be established? Other outstanding questions about the ability to isolate, quarantine, or detain groups or individuals; the ability to mandate treatment or mandate work; restrictions on travel and trade; the authority to seize community or private property, such as hospitals, utilities, medicines, or vehicles; the ability to compel production of certain goods. Also, the question of the use of certain pharmaceuticals or diagnostics that are not yet approved or labeled for certain uses in a crisis. All of these questions involve many different levels of government, many different laws and authorities, many complex ethical issues intertwined. And we need, in a systematic and coherent way, to look at this array of pressing issues and concerns. And not just what laws are in place or could be put in place, but then also what policies and procedures would be necessary to actually implement them.

I've got a couple of other areas I want to quickly mention, and I'm waiting for Tara to give me the hook. The media -- we absolutely have to find effective strategies for dealing with the media. It's such a critical partner, so key to our efforts in a crisis to communicate important information and reduce the potential for panic. Working with them in a crisis means working with them now, a process of ongoing and continuing education, and also the critical development of a trust relationship, so that when we provide them information, or can't provide them with information, we don't have to become defensive but can move on and address the critical issues before us.

And the final thing is the issue of limited resources. The nation has never been comfortable with issues of rationing or triage. Some of it goes on already, and we all know it. But it will be very stark in the kind of crisis that we're talking about at this meeting. There may be delays in getting drugs and vaccines on-site, or we may simply not have them. We're going to have to make hard decisions about who gets access to drugs. It may not be -- it will not be simply about maximizing the preservation of life, but it will be about maintaining critical infrastructure and supporting key workers, including health care workers. And so we're going to have to really think about whether we have a set of priority groups for the use of scarce resources, what that's going to be. Clearly, just an enormously charged, complex undertaking.

We have been thinking about it in the context of pandemic flu, where we know there will be vaccine shortages. And we need to think about it in the context of bioterrorism as well. We need to bring together a broad set of stakeholders, need to involve every level of government, and we need, as a nation, to become comfortable with this situation that we'll almost certainly find ourselves in.

Well, I've gone overtime. I apologize. And, clearly, I've just only touched on some of the critical challenges before us. They are complex and difficult, and we will probably never find completely acceptable or effective solutions. But we are on a critical path. All of us are partners in that effort, and I'm very, very grateful to be part of this and to know that all of you who are here today are going to be continuing this important work forward.
Thank you.
(Applause.)

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**Thomas Inglesby, MD**

**Lessons from TOPOFF**

DR. INGLESBY: We're all here. Good morning. Welcome to the portion of the national symposium entitled "Containing Epidemics of Contagious Disease: Making Difficult Decisions." My name is Tom Inglesby. I am an Assistant Professor in the School of Medicine at Johns Hopkins University and a Senior Fellow at the Johns Hopkins Center for Civilian Biodefense Studies. I will serve as this morning's panel moderator. Over the next 90 minutes, this distinguished group of panelists will describe to you some of the most important factors that decisionmakers would confront in the management of an epidemic. They will bring their substantial expertise to this problem. The format will be as follows. I will make brief introductory remarks, and then prior to each of our panelist’s talks I will give them a proper introduction. Let me just now say before you are Tom Glass, Mike Osterholm, David Fidler, and Laurie Garrett. But in the event people come in late, I'd like to introduce them right before they speak. We'll hold all questions until the end, and we will try and buzz along. Unfortunately, we didn't allow Dr. Hamburg to start until late, so we probably will adjust by 15 minutes, but we'll see as we go. We'll try and stay right with this.

First slide, please.

I will begin this morning's panel with a review of the TOPOFF exercise of May 2000. And the reason I think this is an appropriate start -- the reasons are three. The first is that TOPOFF provided the most comprehensive test of our medical and public health system to respond to a bioweapons attack to date. It revealed valuable lessons as to how the U.S. might deal with future epidemics. And by these measures alone, the exercise must be called a success.

The second is that the issues presented by our panelists will all be very much a part of what happened at TOPOFF, and a discussion of TOPOFF might help put them in context with each other. TOPOFF has been mentioned a number of times already in this symposium, so I think this is just a moment to step back and kind of understand again what happened.

And, lastly, TOPOFF will provide for us a good context for the scenario that we'll follow this morning that will begin at 10:15. My remarks are taken from an article that was written by my colleagues Rita Grossman, Tara O'Toole, and myself, and that article will be in the back. Obviously, time is brief, so it allows only presentation of major points. That article, in turn, was derived from the observations of 11 senior participating...
officials who either were observers, participants, or controllers in the exercise, some of whom are in this room today, and we are very grateful to them.

And we also should note at the start that this exercise brought out the best in medicine and public health at the state and federal level in Denver, and many people tried very hard to do their best for days and nights on end during the exercise. Actually, this is the wrong slide carousel. Would you go to the other talk for me? This is the 10:30. Thank you.

(Laughter.)

DR. INGLESBY: Foreshadowing. Just to tease. Let me move on.

TOPOFF -- in an effort to assess the nation's crisis and consequence management capacity under extraordinary conditions, the U.S. Congress directed the Department of Justice to conduct an exercise engaging key personnel in the response to large-scale terrorist attacks. The resulting exercise took place in May 2000 and was called TOPOFF, named for its engagement of top officials of the U.S. Government. It was the largest exercise of its kind to date -- $3 million in direct costs, much more than that in indirect costs.

The exercise took place in three cities. The chemical weapons attack event took place in Portsmouth, New Hampshire; the radiological event took place in the greater D.C. area; and the bioweapons event in Denver, Colorado. The Denver component, as you all well know by now, involved the release of a covert aerosol of a plague biological weapon, and induced the response of many parts of the medical and public health system, including a number of hospitals in the Denver area, county and state health agencies, emergency management agencies, CDC, the Public Health Service, and the Office of Emergency Preparedness.

This list is not inclusive but is illustrative of the size of this epidemic -- or, excuse me, the size of this exercise. Epidemics will come.

Constraints of TOPOFF -- just one slide on possible limitations and understanding of what this exercise could not do. This is a very complex exercise. Part of it was certainly player driven, and it depended on the participants' responses to questions and events. And part of it, because of the complexity, needed to be predetermined before the event.

So part of this was predetermined, and so it should not be seen as all of the events were derived from participants' decisions. The second limitation was that many of these eventualities in the exercise were notional, and that is to say that they occurred on paper only. And, again, this was because of the complexity and size of the exercise. Examples of this with the laboratory diagnostic testing process occurred largely on paper. Another example was the delivery of the national pharmaceutical stockpile. That was a simulated event; that did not actually take place. And the third was the logistics of medical care at hospitals. Again, while occurred --
many of the hospital leadership were involved; again, most of the logistics were notional in that these hospitals needed to continue to do their routine care.

Two issues of great importance that were not tested in TOPOFF were the public's reaction to a plague bioweapons attack and the media's reaction. Now, they were written into the script, and I think the exercisers did a good job of presenting what might have happened. But these did not occur in TOPOFF for obvious reasons. And, finally, notwithstanding any of these limitations, it's important to note that we think, and the majority of the people we spoke to believe that this exercise truly was a success and revealed lessons, even though it had certain limitations. And we'll present some of those lessons now.

But, first, a review of the exercise. Exercise day one. A covert release of a plague aerosol had been released at the Denver Performing Arts Center on May 17th. The release was undetected, and so the exercise begins with this hypothesis on May 20th. So this is day one of the exercise. Increasing numbers of persons are seeking medical attention at the Denver area hospitals for cough and fever. By early afternoon, 500 persons with symptoms have been reported, with 25 deaths. Plague is confirmed by the state laboratory and CDC. A public health emergency is declared. Hospitals in Denver implement their emergency plans, call in staff. Their personnel begin to wear masks. Antibiotic and ventilator shortages are reported, and hospital staff begin to call in sick.

The governor issues an executive order by the end of the day restricting car, bus, rail, and air travel into and out of 14 Denver metro counties, and seeks to take control of all antibiotics that can be used to prevent or treat plague. Citizens are told to seek treatment at a medical facility if feeling ill or following any contact with a suspected case of plague. Those who are not sick are directed to stay at home. The public is told that the plague is spread from person to person. By the end of the day, 783 cases of plague have occurred; 123 persons have died.

Day two of the exercise. There are reports that hospitals are now running out of antibiotics and ventilators. A Push Pack from the national pharmaceutical stockpile arrives carrying a large cache of antibiotics -- again, notionally. At a Denver airport there are substantial difficulties moving it from the airport to the places in Denver that will need those antibiotics. Plague is now being reported in other states and in England and Japan, and by the end of this day 1,800 cases of plague have occurred throughout the U.S., London, and Tokyo, and of these 389 have died.

Day three. Medical care in Denver is now described as beginning to shut down. Insufficient hospital staff, beds, ventilators, and drugs, are available. The public is now advised to wear masks. Person-to-person spread of plague is occurring as determined by public health officials. The CDC advises Colorado to close state borders to limit further spread throughout the U.S. Colorado officials express concern about their ability to get food and medical supplies into the state. And by noon of the third day, there are 3,000 cases of pneumonic plague, and 795 persons have died.
On the last day of the exercise, day four, there are an estimated 3,700 cases of plague, with 950 deaths, though if you'd speak to different officials there are conflicting numbers, and we believe this would be the case in reality. Some officials believe that at the end of the exercise there were more than 2,000 deaths. And at this point, the Denver TOPOFF exercise was ended.

The lessons of TOPOFF. There were certainly many, and we will focus on the ones that were most striking to us, largely in the medical and public health arena. And they can be distilled into four large areas.

The first are lessons in leadership and decision-making; the second, priorities and logistics for resources; the third are the crises at health care facilities; and the fourth are -- involve principles for disease containment. Leadership and decision-making. I think, as Dr. Bracken said yesterday, leadership matters, and that was clear in TOPOFF. The Colorado governor was unable to participate in this exercise, and so his committee of astute senior advisors de facto played the role of decisionmakers for the exercise. And this committee was composed of senior public health and emergency management officials, but the absence of an elected official was believed by many to have significant impact on the exercise.

The absence of the legal and moral authority that an elected official had was felt to have important consequences, including perhaps the results of the most important decisions, such as how scarce resources would have been triaged, whether to impose travel resources, and other things that we will talk about momentarily. The committee we believe acted in ways that were quite professional and skilled, but, again, it is not clear if those decisions would have been reflected in the elected official.

Decision-making processes were problematic. The governor's committee operated in -- with the community by very large conference calls. At times, as many as 50 to 100 persons were on conference calls. As you all know, if you've been on a conference call with more than two people, this is a tall order. These calls led to what was described as highly inefficient, indecisive, and significant delays in action, as you all might anticipate. Many of the participants in the calls had never worked or met each other, and at times it was not clear who was in charge of the call. The calls were literally running one into the next, taking people out of their usual roles and putting them onto the phone.

There was a clear tension between the need to make the right public health decisions and the need to make decisions urgently, and this tension played out in many ways. But one observer remarked, "With thousands standing outside hospitals awaiting prophylaxis, some officials were citing papers. In this type of crisis, one needs to make decisions quickly. You don't have the luxury of time to do more research." And this is an obvious tension in public health emergencies.

The last here is the coordination of emergency management. A number of different emergency operations centers were set up by state and federal law enforcement and emergency management agencies. Many of the people who participated said it was
unclear to them how these emergency operations centers would interact with each other, would interact with hospitals, would interact with public health officials, and so it was not clear that this system of EOCs, as they were called and are called, was useful in this exercise. Not to say that they could not be configured in that way, but it was difficult for the people on the medical and public health side to understand that.

Next order of lessons involved priorities and logistics for resources. With local sources of antibiotics depleted relatively early in this exercise, initially there was no consensus about priorities. Now, that was resolved relatively quickly when the governor's committee decided to offer antibiotic prophylaxis to EMS officials, police officers, hospital workers, and their families. The decision to treat families was intended to allow medical and emergency responders to come to work and to maintain their willingness to work with families at home protected. Decisions about priorities quickly became much more complicated as the epidemic was found to be expanding.

There was disagreement on which antibiotics should be given and whether antibiotics should be given only to contacts of plague patients, or whether they should be given to the general population. What is the strategy? One observer, again, commented some experts only wanted to administer antibiotics by textbook criteria. In a real scenario, decisions about antibiotic prophylaxis would be a political decision, not a medical decision.

We don't necessarily endorse or refute any of these opinions, but I think they're important. These were senior participants in the exercise. The logistics of antibiotic distribution were difficult. Simulated components of a stockpile arrived in Denver promptly, but the distribution of antibiotics was problematic, as Dr. Copeland said yesterday. At one point, the antibiotics were being unbundled by a single individual and put into plastic baggies. Now, part of this was the exercise, but obviously when the antibiotics arrive a rigorous, robust plan needs to be in place to accept them. Antibiotics were to be distributed at a central antibiotic distribution facility. One such facility was exercised in this exercise. One hundred forty people an hour would have been able to get antibiotics. At this rate, if you do a couple of calculations, and you make a decision to treat most of Denver, you would imagine that hundreds of such facilities would need to be stood up quickly.

In addition to that, the actual process of getting antibiotics is not as easy as it looks. No written guidelines were handed out with antibiotics. People were allowed to take their own antibiotics. There was not so much oversight about how to get antibiotics. And one official said that it appeared to him that it would require hundreds of people in a secure facility like this to actually get this job done.

The next category of lessons -- crises at hospitals. Even at the outset of the epidemic, hospitals were quickly seeing far more patients than they could manage. In the beginning, two, three times normal, up to 10 times their normal volume, were showing up at hospitals; notionally, again, as hospitals needed to continue their usual functions, but 10 times on paper. Antibiotic supplies quickly became a problem, ventilators were
short, as were places to put sick people. People began to have great troubles. There was one quote, "There were not enough places to put sick people, to triage people, or to manage dead bodies." Security at health care facilities would have been a major issue if this had been a real event.

And a fourth category of lessons -- the need to develop disease containment strategies and principles, perhaps the most thorny of issues and the most commonly stated in the people that we spoke to. Again, initially, it was believed that there was insufficient priority put on the containment of the epidemic. Quickly people began to react to sick people, which is understandable. But as a beginning principle, it was not clear that people needed to begin immediately with the concept of, "This must be contained and ended, and our researchers must be directed to those purposes."

Changing context brought changing consequences. Even early in the crisis, antibiotic prophylaxis and isolation were the principle containment measures. But as the epidemic was seen to be rapidly expanding, a series of increasingly intrusive containment measures were ordered, including travel restrictions, including directions to stay at home. One observer said they told one million people to stay in their homes. How would we have enforced this?

By the end of the exercise, people had been asked to stay in their homes for 72 hours, without discussion of how the public would have gotten food or medicine. Towards the end of the exercise, the governor’s committee was -- it was proposed that state borders should be closed. There was not unanimous consensus about what should be done about that, but, again, another statement, "With state borders closed, how were we planning to feed four million people?"

It was stated that a citizen might reasonably be expected to say, "The government has just told me I must stay in my home, so it now has an obligation to provide to me antibiotics and a mask to protect me." But there were certainly not enough antibiotics or masks to fulfill such an obligation. One official said that it appeared to him that sufficient legal powers were in place to take all of these measures, but the problem wasn't legal powers; the problem was deciding when and what was the right thing to do.

And so, in conclusion, what is needed, or what should we do in response to the TOPOFF exercise? We could distill them down into these seven points. The first, political leadership is important in the management of a large-scale epidemic, especially one involving a bioweapons attack. Efficient decision-making would be critical and would not only require the leadership of elected officials, but also the sustained counsel of the proper expertise, like the committee that was set up in Colorado, to provide the expertise to the governor.

The second, to make proper decisions, we will need better information sources, conduits, and analytical capacities. The information that was coming into decisionmakers at TOPOFF was fed to them by the exercise controllers. It is not clear that they would have had anywhere near the power of information that they got in this exercise to make decisions. So we need real-time information tools for epidemic
management that allow officials to collect information, to analyze it rapidly, to move from paper and pencil to the information technology tools that we have available in the rest of our society.

Priorities for scarce resources should be thought about and considered well ahead of time. A well-designed and managed pharmaceutical stockpile is certainly important, but equally critical is the local capability to distribute, and the decisions to -- on how to distribute scarce resources.

Public health resources were certainly in high demand. And as Dr. Hamburg has said on other occasions, we must not double, triple, or quadruple count the same person during the same activity. Participants in this exercise should be praised for what they did. They worked hard to do everything they possibly could to stop this epidemic, but in reality it's clear that we would need a mechanism to augment public health resources, especially personnel, in the event of a large-scale crisis. And local public health agencies are beginning to consider that.

Hospitals would need to have plans in place. Obviously, I can't add to the panel that took place yesterday. Incentives need to be set up to make hospitals able to withstand some kind of surge like we're talking about now.

There is an urgent need to formulate clear, scientifically and politically clear principles for disease containment, and that will be a subject for a later this morning scenario.

And, lastly, dual use systems.

Let me end with this final quote. "At the end of the exercise, many issues were left unresolved. It is not clear what would have happened if it had gone on. There were ominous signs at the end of the exercise. Disease has already spread to other states and countries. Competition between cities for the national pharmaceutical stockpile had already broken out. It had all the characteristics of an epidemic out of control."

So I'll leave you on that fairly sobering note, and now turn to the panelists who will provide you with great, deep knowledge of many of the areas that we just glanced quickly over.

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**Thomas Glass, PhD**

**Understanding Public Response to Disasters**

DR. INGLESBY: Our first speaker this morning will be Dr. Thomas Glass. He's an Assistant Professor on the faculty of epidemiology at the Johns Hopkins School of Public Health, who is a social scientist and epidemiologist with special expertise in public
response to disasters. His former faculty position over much of the past decade was at the Texas A&M University, Hazard Reduction and Recovery Center. He was a principal investigator on an extensive National Science Foundation funded study of public response to 10 mass casualties disasters. He has held faculty positions at Harvard, Yale, and now Johns Hopkins. His talk is entitled "Understanding Public Response to Disasters." He will discuss from analyses of prior disasters, what can be stated about the public response to disasters now. How should expectations of public response influence our planning efforts? Dr. Glass?

DR. GLASS: Thank you, Tom. I’m very glad to be here. I suspect that I am actually the least distinguished speaker at this conference, but I am an academic. And as Dr. Falkenrath observed yesterday, this gives me some license, as an outside observer, to bring a different perspective to the table. So, in essence, we are now moving from Tom's talk about exercises and the world of "what if" to the "where the rubber meets the road." And I’m going to talk to you briefly about what can be learned from the study of actual technological or natural disasters, with the eye to what can be learned for preparation for potential biological weapons release. These conclusions are necessarily speculative and subject to the limitations of these data.

First of all, a quick overview. I want to do three things in this talk. One is to describe in broad terms the results of a comparative study of 10 natural and technological disasters that we undertook at Texas A&M University some years ago. I'll try to condense these to the most relevant important facts, and I’m going to tell stories rather than give you data, because I think they are often more compelling.

Secondly, I'd like to draw out the implications of this reasoning for bioterrorism research.

And, third, just to state up front the essence or theme of my remarks, and that is that there is -- despite the temptation to think about preparation for biological weapons release, solely in professionalized terms, it would be a terrible mistake to ignore or underestimate the role of the public. And, in fact, I think there has been a relative lack of attention to what it is -- what role the public plays in all of this during the context of our discussions, with some notable examples. In fact, I'd argue what the public does, what the lay public does, both individually and collectively, will make the greatest difference in the ultimate outcome.

We did this study between 1984 and '94, and it was funded by the National Science Foundation. It was really one of the first studies done in this way. We sought to study 10 events comparatively. We had a quick response team, including an engineer to look at the built environment. We had social scientists and epidemiologists, survey researchers, and our idea was to look multidimensionally at the various response processes in mass casualty events, to try to get a sense of what the general patterns are. The goal was to conduct this multi-disciplinary study to try to learn about pre-hospital care, hospital-based care, characteristics of buildings and structures and what difference that made, and the role of victim response.
And this was a rather unique study of its time. In fact, very few people have actually empirically, at least university-based researchers, have actually looked empirically at response to mass casualty events. Here you can see the events we studied. They include both large and small events, natural and technological events, and what I would call single-site versus multi-site events -- a distinction that I will come back to later.

In the far right-hand column you see a summary of the casualty figures. In all of the events we studied, the common refrain from all of those studies, from an epidemiologic point of view, was it’s a miracle that more people weren't killed. The World Trade Center, six people killed. Loma Prieta earthquake, 62 killed. Hurricane Andrew, 34 killed. I can still remember the day that I drove down into the Homestead area and witnessed the degree of devastation of the built environment there, the residential communities, and I found myself absolutely astonished, given the numbers of people that we estimate to have been in Homestead that night, that there were only 34 casualties. The common story behind each of these events is that victims respond to these events resourcefully and collectively in a way that mitigates disaster, in ways that surprise people. And I'll talk more about this in a minute.

Now to the five main lessons that I think we learned in the context of this study. Disaster planning doesn't always go as planned. Disasters are not chaotic, but things don't usually go as planned. Formal response systems tend to break down. Communication systems notoriously fail. Plans are not implemented in the expected way.

Dr. Rubin’s remarks yesterday about hospitals not functioning within the system is something we saw over and over and over. Now, this is not always a bad thing. When we do top-down planning, we tend to set up overly rigid planning frameworks, and sometimes it’s better that hospitals and individual EMS personnel, etcetera, freelance, because sometimes that emergent flexibility is something that is very, very useful.

There is a tendency to plan for the wrong things. In most disaster drills, particularly in hospital community -- community hospitals, we tend to prepare for heavy trauma, lots of heavy trauma. That's what we expect. That's what we plan for. In our experience, the vast majority of injuries after disasters are minor. Disasters tend to be, for the most part, primary care events. There were more people at Hurricane Andrew injured in cleanup than during the actual event itself. While all hospitals and emergency systems, EMS systems, conduct disaster drills, they don't usually include the externalities to make real disasters challenging.

So drills are done -- rarely done when the staff isn't expecting them, or at night, or during bad weather, or when vital personnel are on vacation. Drills rarely are designed to include communications failures, and I think this is one recommendation that comes out of our study is that you need to prepare for communication failures, because they are almost ubiquitous. And drills don't take advantage of the fact that the hospital infrastructure and the personnel are often directly impacted by the event itself. Drills tend to be mandatory for nursing staff and house officers, but I'm not speaking here of Top Off and the high visibility drills. But in exercises in smaller places, the senior
medical staff tend not to go. And as a result, the disaster event occurs, and the typical convergence on the hospital -- here come the psychiatrists and all of the various other personnel who hear about the disaster and converge on the hospital. And the medical director of the facility takes command in the ER, but has not been to the exercises, doesn't know the procedures, and things get rather mixed up at that level.

An example of this is the crash of USAIR Flight 405 at LaGuardia Airport, March 1992. In that event, they had done a disaster drill of a similar event, exactly in the same location that the plane skidded off the runway one year earlier. However, in the drill, there was no traffic because people weren't flooding to the airport upon news of the air crash, and so the -- in fact, on the day of the event, the incident commander was not -- it took him two and a half hours to get to the airport because of traffic. They hadn't anticipated that. The actual event occurred at nighttime, so when the first responders got to the plane they tried to radio back to the MS commanders, but they couldn't tell them where on the runway exactly the plane was, because it was dark and they had always drilled during the day.

So it's a reminder of the idea that exercises need to think about externalities, and that there will always be limits to what can be learned from these exercises.

Lesson number two -- victims respond with collective resourcefulness. Mistrust of the public's ability to participate effectively in EMS response is widespread. Disaster planning has tended to emphasize centralized high-tech DMAT, USAR, and other kinds of highly professionalized groups. The result of this tendency is that professionals treat the public as an unwanted nuisance, as part of the problem. I call this the yellow tape effect. In other words, EMS personnel tend to try to establish a kind of physical and psychological perimeter around an event demarcated by that famous yellow tape. And this event is supposed to be a fence keeping the public out.

Now, this is overall a useful and functional strategy in a typical emergency, but in a disaster, when by definition the resources and capacities of local formal EMS responders are insufficient to handle the needs of the problem, then this yellow tape phenomenon becomes a tremendous difficulty, because what it does is it relegates the public and the lay bystander to a secondary role.

Overall, the evidence suggested victims tend to respond effectively and creatively. What we saw over and over in disasters was that victims formed spontaneous groups that have roles and rules and leaders and a division of labor. This is the phenomenon of collective -- emergent collective behavior talked about extensively in the literature on the social science side. And this makes it possible for ordinary citizens to do extraordinary things. An example, in the sewer explosions in Guadalajara, Mexico, which was a tremendously violent, nasty explosion leveling 5,000 homes, citizens formed search and rescue teams that performed in amazing ways. They used automobile jacks to lift rubble. They used garden hoses to get air into void spaces where people were trapped. And, of course, the majority of people rescued in that event were rescued by ordinary folks and not by the military, the Red Cross, the Green Cross, etcetera. Incidentally, there was a high degree
of cooperation there between civilians and formal EMS responders, something that would not have been likely to occur in the United States.

Number three -- and, of course, this is potentially something we could disagree about. But, in fact, the literature shows -- and our study shows -- that panic is relatively rare. There's a lot of talk about panic, and there's a general assumption that the public would panic in a bioterrorism event. My question is: where do the data come from to support that? In the events that we studied, we were amazed to interview victims and health care workers who commented repeatedly on the absence of panic, complaining, or irrational behavior. Many emergency department workers said, "Gee, I wish things worked this smoothly all the time." Most people talked about an eerie feeling of calm that came over people during life and death moments. Panic happens in disaster movies, but typically not in real disasters for reasons that probably are based in evolution.

What we witnessed is ordinary citizens are amazingly capable of avoiding deadly harm. One exception to this rule about panic is the case in which strangers are entrapped in a fire. The classic example of this is the Coconut Grove Night Club fire in Boston, which, interestingly, happened in 1942 on this very date. In that event, 491 people were killed. So knowing that, the one event that we've studied that we figured there would be a lot of panic was the World Trade Center bombing. There were thousands of people stuck in these vertical columns, these stairwells. They were dark. They were filled with smoke. There was no lighting. There was no sound. We figured this was a recipe for panic. If we were going to see panic anywhere, we would undoubtedly see it here. It took people hours and hours to get out of these buildings because they were stuck in this vertical column of victims trying to get out.

We did observations and we did a random sample of 415 people who were in those stairwells, and we found by their reports, as well as other data, that panic was actually quite rare. And, in general, people said that there was relatively little panic, and that people were generally cooperative and friendly.

And, of course, we reasoned that the -- we decided that the reason for this is that people entered these stairwells in kind of strata, a people who knew one another, because they entered the stairwells in their workgroups. And this is one of the lessons that we came away with, was that personal -- preexisting personal knowledge of one another, being in a situation with people you know, inoculates against panic and dysfunctional behavior.

Now, the question of whether there would be panic after a bioterrorism event is a very complicated question, and I don't claim to know the answer. I will say two comments about that, though. Number one, the historical record on the 1918 pandemic in general does not bear out projections of panic. Number two, whether or not groups or individuals panic may have a lot more to do with what we, the professional community, do in the way of preparing and providing information to the public than any inherent tendency within the public.
So I think in general our tendency is to withhold information too long for fear that it will cause panic when, in fact, it’s the absence of information that is most likely to cause panic. This is a very complicated issue, and I’m not trying to oversimplify it. But that’s, in general, a place to start.

Lesson number four -- the majority of lives will be saved by the public. In disasters, we talk about the -- we used to talk about the golden 24 hours with respect to earthquake preparation in particular. I suspect -- in our findings, the most people who died died very, very quickly. And the result is those who were going to be saved were injured in a more minor way, and the vast majority of people who were injured and rescued were injured by bystanders and not formal EMS providers. Now, again, I’m talking here about earthquakes, hurricanes, etcetera, where the EMS system gets very disruptive. And I’m talking about multi-site incidents.

The dominant pattern is that EMS professionals tend to arrive late to multi-site events, due to disruptions, communication, traffic, and other kinds of problems. An example of this -- the Nimitz Freeway, the Loma Prieta quake. We studied that event quite extensively. The EMS response was slow. They were getting 911 calls by the thousands. 911 is not set up for disasters. It’s very difficult to prioritize when you have literally thousands of calls coming in simultaneously, saying, how do you triage the incoming calls, from a 911 perspective, during a disaster?

There were about 150 people on the Nimitz Freeway. It was -- despite the fact that it was publicized on TV during the World Series, about 50 people were killed instantly, or relatively quickly, about 50 people walked away from -- on their own power, and about 50 were rescued. Of those 50 who were rescued, 49 were rescued by lay bystanders, workers who were working in an industrial facility below the Nimitz Freeway, who did amazing things like they made backboards out of road signs, and did these rather amazing things. And then they waited several hours for EMS to finally arrive in that situation. You may remember that one person who was excavated by EMS. It was widely televised by CNN. But, of course, by the time they got there the majority of people had been rescued.

Lesson number five -- other social factors to be considered. Trust -- where do -- people will go where they trust health care facilities, especially in a disaster situation. The truth is that we tend to assume that people are going to go to the VAs or these tertiary care hospitals, when indeed people tend to trust local hospitals more.

Rumors will fill the information gap. Sometimes these rumors are conspiratorial, and sometimes they are very destructive. And whether or not these rumors are destructive will have as much to do with how and when and from whom we release information.

The press problem has been remarked upon a couple of times. One theme is the characteristics of social relationships, preexisting social relationships, tend to be very important and ought to be considered. Quickly, implications for bioterrorism -- and I’ll just run through these relatively quickly. I know time is short. First of all, victims will
self-transfer and self-triage. There will be no perimeter, for the most part, for an event of this type. The boundaries of the event will be permeable. People will come to the hospital on their own. And, of course, what will happen is what happens in all disasters of this type, is that the emergency rooms tend to fill up with the least severely injured in the initial stages, because it takes the more severely injured people longer to get there. So we need to plan for this.

Number two, we need to anticipate that emergent systems will arise. And we need to plan for what people are going to do rather than what they are supposed to do. And if this is the mantra that we learn from our study, I would say that’s it. Hospitals will be heavily stressed. If you look at the numbers, if we have numbers presented yesterday, if we have 100,000 casualties and 300,000 -- I’m sorry, 3,000 hospital beds, you do the numbers. What we're going to have to do is develop -- and I think there is a strain or a thread of denial that runs in our thinking. If there’s a massive event, it’s not simply going to be a matter of moving people to other hospitals, and it's not going to be a matter of developing clinic relationships. Home care and other kinds of models, as occurred in 1918, are going to have to be seriously considered. The public response will shape the extent of the epidemic through patterns of evacuation, self-help, collective action, and rumorung.

Finally, so how do we involve the public? The idea here is that I believe in all our conversations at this conference about partnerships, I’ve heard very few people say we ought to make partnerships with the public, with the general public. How do we do that? Well, public service announcements. Why not? We need a public communications strategy. We need a strategy for what it is we're going to do if an event occurs and we need to notify the public. And that's going to have to be very clearly thought about. That is going to be one of the most crucial features of response to this kind of thing.

Excuse the alliteration -- pocket-sized PPEs for the public. This is something that I haven't heard anybody talk about. We need to decentralize the capacity for response. We need to work with civic organizations, churches, neighborhoods, corporations. These are the organizations people trust. This is where people live and reside, and these organizations can be mobilized as a kind of infrastructure of a scaffolding around which the public can participate.

Publicly, we need to collaborate with the media. The hero in Hurricane Andrew was a radio announcer on an AM talk show who everyone listened to in Homestead. And this guy rather amazingly told people to get into their bathtub and put their mattress on their head. This guy saved more lives than anybody. We went to -- we interviewed many, many victims, and we went to many, many homes where the entire home was destroyed, and there was a bathtub and a mattress over it. And the people spent time during that hurricane with their little AM radio, with radios, listening to this guy who talked them through this. So as much as we talk about the press being a potential difficulty, we need to also see them as potential allies.
And, finally, we need to train EMS workers to cut the yellow tape in a disaster, and to be trained to work with the public and not see them in some sort of adversarial kind of function.

Thank you very much.

(Applause.)

Michael Osterholm, PhD, MPH

How to Vaccinate 30,000 People in 3 Days: Realities of Outbreak Management

DR. INGLESBY: Our next speaker is Dr. Michael Osterholm, who is known to many of you. He's the current Chairman and CEO of ICAN, Inc. Prior to this position, he served in various capacities for 24 years in the Minnesota Department of Health, 15 years as the State Epidemiologist and Chief, Acute Diseases Epidemiology Section. He's an Adjunct Professor at the Minnesota School of Public Health, University of Minnesota School of Public Health, written more than 185 papers, 18 book chapters, countless publications on bioterrorism. He served as a personal advisor on bioterrorism to King Hussein of Jordan, has spoken widely on the subject, and has recently published a book on bioterrorism entitled "Living Terror." His talk entitled "How to Vaccinate 30,000 People in Three Days: Realities of Outbreak Management." Dr. Osterholm?

DR. OSTERHOLM: Good morning. Thank you, Tom. Thank you also for the invitation to be here today. Let me just say, parenthetically, in follow up to last night's discussion - - Tom mentioned my role with King Hussein -- if there's any doubt whether Iraq has small pox, His Majesty told me a month before he died that he knew Iraq had small pox. So there is an answer to that; some were doubting that last night. There's no doubt in my mind.

But today what I'm here to talk about is the issue of, how do we begin to look at response? And what you're going to get from me today is really a collective experience. There is no textbook. There is no chapter written. There is no one way to define it. As much as I congratulate the New York City Health Department for their work with West Nile Virus, it only brings back memories to me where in 1984 I was in charge of spraying malathion on 287 Minnesota cities, over 45,000 square miles, because of an outbreak of western encephalitis. Our group has worked up the single largest food-borne outbreak in this country with 320,000 cases of salmonellosis associated with Schwann's ice cream. And today I'm here to talk to you about the issue of meningitis outbreak and a very large immunization program.

Not any one of these experiences give us the answers. All of these experiences give us a common vision of what the future might be -- a vision that, I might add, that to date I
am concerned that we have not really learned from the local to the state to the federal level.

What I’m here to talk about today is an outbreak that occurred, as they usually do, on weekends. A phone call came in on a Saturday morning, on Super Bowl Sunday weekend in 1995, to Dr. Richard Anella, who’s in the audience here. I quickly received that call. Three students in the community of Mankato, Minnesota, all from one high school, had been hospitalized in the previous 12 hours at the local hospital with suspected Neisseria meningitidis infection. All three of them were in serious to critical condition.

What then transpired over the next month was actually two separate clusters involving ultimately 10 cases and one death of Neisseria meningitidis, resulting in an immunization program where over 30,000 of the residents of Mankato, Minnesota, were ultimately vaccinated. There are 55,000 residents in the community.

As some of you may not be aware of, Neisseria meningitidis, particularly group C, is the strain that we worry about most in cluster outbreaks that had occurred particularly during that time in the mid 1990s, and usually involving college campuses in particular.

What I want to talk about today briefly is the overall view of the panic and fear that did occur, and why I think it so distinguishes itself from the acute event, like an explosive device or a natural disaster like an earthquake or a hurricane, whereas I think a biologic event does, Tom, give a very different sense of potential for panic and fear -- issues around surveillance and medical care of the communications systems that are necessary, vaccine and antibiotic distribution, public relations, political considerations, medical community relations, and cost.

But before I can really comment on those, let me walk you through the experience as we had it unfold for us. As we talked about, we had a situation where by Saturday morning we recognized that we had a particular outbreak occurring. We continued to work through this on Saturday. With Sunday, a new admission had come in Sunday night, although at that time was not yet one of the three cases.

We actually had a meeting with the local medical community, the hospital, the local public health, and we actually did bring the media in very early, along with elected officials. And we decided, because of this issue, that we would need to vaccinate students in one of the two high schools in that town, in particular where all three students came from.

We ultimately expanded later in that night’s discussion to all high school students, all junior high students, based on this particular potential for explosion you might say. An actual immunization clinic was planned for two days later. It took us that long to get the vaccine in, and, fortunately, we were able to get vaccine. However, things continued to unfold as the week went on.
The immunization clinic which we held on Tuesday morning was quite remarkable. We vaccinated 1,000 students in 35 minutes. Public health does have the ability to do some remarkable things. We had six lines set up, and I'm going to tell you that because that all happened within the context of a school setting under a very controlled situation with a very well-defined system for obtaining consent. You can't do that in the general public. It's the difference between how you handle prisoners and how you handle the general public, you might say.

(Laughter.)

That's a big difference.

(Laughter.)

And that's an important point, because you might want to extrapolate those numbers from that particular point.

As the week went on, we actually had five students that had become ill. We also had -- four students, excuse me, and a 64-year old woman who had a lot of contact with the students; and, therefore, we felt that this person was part of it.

We thought things were winding down. We immunized 3,300 people against meningitis, using a combination of the public health system, the hospital-based system, volunteers within the nursing community, and so forth, and set this thing up. This was a challenge, just to do this in the amount of time. The panic and fear was not yet there. People were concerned but not yet there.

But then, just as we thought this was winding down, on Friday morning I received a very dreadful call, and, in fact, a student, a junior in the high school at that time, walked into the hospital under his own power at 7:30 on that Friday morning with what was obviously rapidly-developing meningitoxemia. At 10:30, they pronounced him dead. It was one of those situations where the panic and fear -- and now, by the way, another student was just now being admitted, and this individual, by the way, had been vaccinated. He had gotten his vaccine on Tuesday. It obviously had not yet had time to take effect.

I also wanted to here, as the panic and fear took over, this was one of those situations where you talk about taking care of the caretakers or the Health Department people. This particular boy that died -- actually, I spent a fair amount of time with his parents that afternoon -- happened to be exactly the same age as my daughter. I wanted so desperately to go home and kiss her goodnight that night. I couldn't. I went to bed at 2:30 that morning and got up at 5:00 like everybody else to get ready for the additional efforts. And we often don't appreciate what toll that takes.

We had the classic news issue. Unfortunately, this happened during the month of February, which, many of you know, in this country is sweeps month. And so this
became the sweeps month story for all of the midwest media. We had satellite trucks all over through town. That was not such a problem in the sense on a whole they were doing a pretty good job with the media, particularly the local media. But there were many examples where just a single media mistake made major issues.

On the Sunday night of this particular weekend, one reporter doing a live standup report got confused and thought he had heard the Mayor say they were going to close all of the schools. So he reported that live on TV at the 10:00 news on the number one news channel in the State of Minnesota, and we then had to deal for the next three days with what the confusion was around this one reporter's error. And I think there is also a big distinguishing feature between live media and print media. And I would urge, as we talk about media, we don't lump them into one category. I think there's a big difference there that's very important.

We had a weekend of watching and worrying. This was -- we were going to now vaccinate additional individuals. Every student in the Mankato area was now going to be vaccinated. This was an auditorium full of individuals, much larger than this auditorium, and the panic and fear began to develop as we talked on that Saturday afternoon. I think the issue of what people are looking for in times like this -- they're looking for someone that they can feel confident and reassured in. I'm not sure that I offered that voice at that time, but it was ironic that I had just helped complete writing the American Academy of Pediatrics Red Book Committee, or Committee on Infectious Diseases, guidelines on how to deal with meningitis. And I had never been at one like this before, and I just got done writing the guidelines before that. But it gave some people the sense, we must know what he's talking about; he wrote the guidelines -- even though they didn't know I was making it up as we went.

(Laughter.)

But I think that's a very important message, that you've got to have somebody that people believe is in charge, and somebody that can help. This particular father you see here was an individual who was extremely angry, wanted the schools closed. We figured that, as the epidemiology had shown in many other instances, that the transmission of Neisseria meningitis likely was through intimate contact, saliva sharing, and so forth, and that the places where that often occurred was in the shopping malls where they shared pop and sodas, and beer at beer parties, and etcetera, etcetera. And, in fact, ultimately, we could trace most of these students back to a single party that had occurred -- the students that were cases. What was amazing is this particular individual right here kept his daughter home that next Monday, along with 14 other daughters, who all went to his house and had a party there all afternoon sharing pop cans. Again, what people may perceive as risk reduction may be risk enhancement, and what you're saying is risk reduction may not be believed. And so you often have to deal with that issue.

We tried to get or regain a sense of normalcy after this immunization program. This is now February 17th, two weeks later. And I only set the tone here because now our staff
has been going non-stop for basically 23 days, 18-hour days. We no sooner get done, we’re ready to go here, and an outbreak of invasive streptococcal group A disease occurs in Rochester, Minnesota, in an area around there. Seven cases occurred very quickly. Four patients died. We did not even have a moment to ourselves. We literally went to Rochester, and now we’re in the middle of this big outbreak, which was a second huge news media story for sweeps month. And we still had people working 18-hour days.

We were just getting ready -- we got that one wound down, and we got people pretty comfortable with that, and then kind of all hell broke loose. The last Friday of February, as we were just winding down the invasive group A strep situation in southeastern Minnesota, a second case -- a student outside of the school district -- and then a third case in a college student. There was a college in this town -- then occurred on that particular Friday and Saturday. And so we never skipped a beat. We went right into it, and at that point it was clear that the outbreak was no longer contained in these students. It was in the community. It was much larger. Not knowing what was going to happen here and in other communities where group C meningococcal outbreaks emerged like that, they continued to often be big. And so we knew we had to vaccinate largely the community, particularly those under age 35.

We then moved to do that, and in a period of four days we ended up vaccinating 26,000 people. We thought originally it was going to be 20,000. It ultimately ended up as 26,000 people. The logistics were a nightmare, in terms of attempting to basically get us put together here, and what was the necessary materials we needed. What you saw happening here was long lines occurring. We actually put together a single site to do this at, which was an Army Reserve location. We did that because of traffic and because of the fact that we could get at it.

One of the issues that -- it was addressed earlier -- was in this case we also gave rifampin, along with immunizations. Rifampin is an antibiotic. All of this came in large containers, and in Minnesota you have to be a registered pharmacist to dispense medications. We had to get special dispensation to have people literally sit hand-counting rifampin, and actually also making it up into simple syrup for pediatric doses, which was a nightmare. We literally called in every pharmacist we could find in the State of Minnesota to get involved with this situation.

The long lines in Minnesota are not that bad, unless it is the middle of the winter where the elements are substantial, and we had lines that were blocks long. We had traffic jams that occurred. We actually worked out a transportation system to get people to move in from other locations and park and then come in and get back out again. Within the first day, also realize that people have other human needs --

(Laughter.)

-- and that you don't often think about those kinds of things that were very important. We ended up getting 6,000 people who got their shots on the first day. Ultimately, over a four-day period, we vaccinated 23,452 individuals. With the original 5,800 and some
we vaccinated, we came out at 30,000 people. The outbreak stopped. But what did it mean? Well, first of all, we did have a lot of panic even in this situation. We actually had truckers that would not come through this community, and because this community was on a main highway in Minnesota -- for weight-bearing purposes, those trucks can only go on certain highways. We had truckers that literally went 210 miles out of their way to get from town A to town B, just so they wouldn't have to drive through the community. Panic was clear and evident, and it's because partly it's an infectious agent, which hits all of our psychological buttons, and part of it was the fact that it also was something that dragged on, and no one knew who was next, when was it going to hit, where was it going to hit.

So I would -- unlike Dr. Glass' examples, which I think are very good ones, biologic agents take on a whole new dimension to them than something that happens right now and we're into consequence management thereafter. What were some of the issues that we learned? Panic and fear was clear. And in this case, where we didn't have a respiratory transmitted agent as such, we were able to convince people that there was some nature to the saliva contact, etcetera, that helped. I can only imagine where there wasn't enough antibiotics or wasn't enough vaccine, and we had a respiratory-transmitted agent, the panic and fear that we saw here would be mild.

Surveillance and medical care must be kept up and ongoing. I can tell you that any time something like this happens, anyone who had a flu-like illness came in. Every person thought that their son was that kid dying, because that son woke up one morning with a fever, the same way that that boy that did die woke up with a fever. The emergency room was overwhelmed in this community. We actually had to set up a separate emergency room for the hospital. That was a major triage issue. And we were sitting there constantly trying to figure out who was really a potential case and who wasn't. Remember, this occurred right over flu season, and so we had the two sitting on top of each other.

In terms of communication systems, I can only tell you that we typically really don't understand what communication means from an electronic standpoint or from a person-to-person secure standpoint. And in terms of just trying to communicate with professionals who are already overwhelmed -- it wasn't just the electronics of it. If they are working 18 hours a day, how do you get them to take half an hour out or whatever to give them an update, to make sure they know and to have them be a stakeholder in what's going on. So you have to force communication. Some people may think that sounds crazy. You have to force it, so people know what's going on. And as far as the general public, we had to set up a phone bank. We brought down two different phone systems in a period of one day, and very few of us have really thought far in advance of, how would you set up a multi-line phone system that would not bring down a particular exchange? You've got to have that in place, and then you've got to know how you're going to staff it. We actually had -- every nurse at that hospital literally was working 18-hour days, both as a nurse on staff and then volunteering in their off time to man the phone bank, along with public health, to answer all of the calls.
We have a situation in vaccine and antibiotic distribution. That was the right slide. You have the issue of the source. We were fortunate to be able to get meningococcal vaccine flown in from Pennsylvania, although we did have all of the same problems of weather. It was in the middle of the winter. We actually almost had a flight missed because O'Hare was snowed in. All those kinds of things.

You have the issue of cost. This ultimately, just the vaccine part of it alone, cost the State of Minnesota $1.2 million. My entire budget for the section at that time was about $2.2 million for the entire year. At first we thought we were going to have to eat that cost. Fortunately, the state legislature did an emergency appropriation. The hospital was never reimbursed. The hospital took a heavy hit. It was a major hit on them. And to this day, they had to eat it as a community.

In terms of the issues of packaging, and so forth, I mentioned earlier that we paid very little attention to that. That is a key issue. And the federal stockpile has to listen to the local people tell us -- tell them how they need it, how it's going to work best, in terms of just getting it out there. If you have to spend twice as much time to get it ready to give as you have to give it, that's a problem. Also, the issues of storage and security, we weren't really in a problem situation here, but I can only anticipate that in future outbreaks where vaccines are in short supply, or antibiotics, that will be an issue.

And then, finally, in terms of administration, let me just show you a whole series of things. Having enough professional staff -- we ultimately involved over 600 people in this outbreak response. To be able to actually have the physical location, you've got to find a place that, from a traffic pattern standpoint, from a security standpoint, from all of the elements of having thousands of people converge it, you can deal with. You actually have to have crowd control. You saw the long lines there. This wasn't a panic and fear situation, as it might be in some. But very few people really understand what it means to have crowd control in that kind of setting where lines can last for hours. We had people that literally waited out in the cold for 10 hours to get their shots, with young children. And so the point is, how do you deal with crowd control in a setting like that, where you can expect nervous, panicking people are only going to get more frustrated?

You have the issue of eligibility. We actually had people who were scared away from this community. We had people who came in 30, 40, 50 miles to get vaccinated, because they knew it was going to hit their community next. How do you determine what eligibility is? You don't have time to sit there and argue. But if you're trying to measure out a very limited supply for a very high-risk group, much as we're trying to do with the influenza immunization right now -- and we're not doing a very good job of it because we've got a lot of healthy 20-year olds getting vaccinated right now in workplace settings -- how do you do that? And that's an issue.

The area also, then, of consent, particularly for minors, is a very, very big issue. And then you run into the issue of contraindications, and what are you going to do with that.
Let me just close off here, then. Public relations is a key piece. I think all of the comments that have been made about the media, and so forth, are very important. We need to be able to deal with that.

The political considerations -- we were lucky in Minnesota that several of us were well known to the political leaders. We involved them early on. The governor of Minnesota, who was a former participant in the first symposium, was someone that I had worked with closely, and so he, of course, kept telling the media that he was very convinced we were doing the right thing, and that was good.

But I know in other situations where you can get a political crosswire going between a local and a state that can bring the whole thing down like this in terms of questioning.

And finally, last but not least, is just the medical community relations. Remember, we've all been talking about how the medical community is not involved in this planning. Well, they typically are too busy.

But now when it's in their backyard, and they need to be the local authority, they need to be seen as the trusted voice, how do you communicate with them quickly that you're going to do this program, and yet they've got to be part of it, but they don't know what's going on, and yet they've got to support it.

And working with your medical community at that time is kind of like trying to drain the swamp when you're up to your ass in alligators. That is something that's got to be done now, not later. You've got to get the medical community on board.

I would just close by saying, in response to an outbreak of meningitis in Minnesota, pushed one of the premier state health systems in the country to the edge. I've done a survey of state epidemiologists, an informal one. I think that there isn't a state in this country right now that, on average -- larger states could do different -- that could vaccinate more than 10,000 people per day.

This past weekend, the Thanksgiving weekend, there were 300,000 people that came to the Mall of America in the Twin Cities. If you look at any large city in this country, Minneapolis-St. Paul, of 2.5 million people, you do the math -- if we could vaccinate 10,000 people a day, how long it would take to get done. Totally unacceptable. There is no local system in this country that's prepared to deal with this. It's going to have to be a federal, state, local partnership that has to get planned right now, because we're going to have to vaccinate. We're going to have to give out antibiotics in a very short period of time.

I think this really benchmarks our ability to respond to a -- this outbreak to this particular bioterrorism event. But I think the thing I'd really leave you with is it isn't really pretty from where we stand right now. We could not do much more than what we did here in Minnesota. We have a very, very premier system.
If this had been a need to vaccinate 100,000 or 200,000 people, for me, it would have been the difference between having to walk from here to across the street versus having to walk home to Minnesota today. I'd have probably just given up and said, "It can't be done." We've got to address that issue now, or I'm afraid when it does happen we're going to have a lot of people thinking, well, it just can't be done.

Thank you very much.
(Applause.)

David Fidler, JD

Legal Issues Surrounding Public Health Emergencies

DR. INGLESBY: David Fidler is our next speaker. He's an Associate Professor of Law at the Indiana University School of Law. He is one of the world's leading experts on international law and infectious diseases. He is the author of numerous publications in legal and public health periodicals. His books include International Law and Infectious Disease, International Law and Public Health. He has served as an international consultant to the World Health Organization, to CDC, the Department of Defense, and the Federation of American Scientists. And his talk entitled "Legal Issues Surrounding Public Health Emergencies."

MR. FIDLER: I would like to thank the Center for Civilian Biodefense Studies, and particularly Dr. Tara O'Toole, for inviting me to participate in this symposium. While I am appreciative of that invitation, I'm also a little intimidated. This is the first time I think since I played a corpse in a high school pla
(Laughter.)

MR. FIDLER: -- I hope my comments today are slightly more entertaining.

(Laughter.)

MR. FIDLER: -- I hope my comments today are slightly more entertaining.

The growing concern about the use of a biological weapon by a state, or more likely a terrorist organization against the United States, often focuses on the potential that new advances in science will be employed for evil purposes. It is this potential that Dr. George Poste described yesterday as the peril lurking in the promise of biotechnology. In many meetings on bioweapons that I have attended, discourse frequently turned to this specter of evil science. Individuals skilled in science ponder what kind of awful bioweapons competent but warped scientists could create. The conversation then
typically delved into the horrors engineered pathogens could inflict on human societies. As a lawyer, I am not trained to put people in ambulances, but, rather, to chase ambulances.

(Laughter.)

MR. FIDLER: When I listen to scientists ponder the specter of evil science, I sit in mute fascination and horror, but I don't really have anything to add to those conversations. I wouldn't know a plasmid if it smacked my transposon.

(Laughter.)

MR. FIDLER: But having an ethical duty to justify billable hours exerts pressure on --

(Laughter.)

MR. FIDLER: -- the creative juices of the lawyer.

I was getting a little bit concerned in connection with bioterrorism that scientists were getting all of the attention and having all of the fun. But after sitting through many evil microbe engineering sessions, it dawned on me that even an evil scientist interested in bioterrorism might need a lawyer.

(Laughter.)

MR. FIDLER: So let me take you, therefore, with Dr. Evil as he visits the law offices of Rumpole, the Malevolent.

(Laughter.)

MR. FIDLER: Dr. Evil has developed a nasty bioengineered microbe, but he wants to make sure he uses the microbe against a very vulnerable society. He visits the law offices of Rumpole, the Malevolent, to find out what kind of legal system would be the most vulnerable to a bioterrorist attack.

After commiserating with Dr. Evil about how bioterrorists and lawyers are misunderstood by society, Rumpole's advice might go something like this. Your ideal legal target for a bioweapons attack is a country that has a fragmented legal system, in that relevant legal powers to respond to a public health emergency are divided among actors at the national and local levels.

Federalism is, for instance, a fragmented legal system. A federal legal system would be an attractive target because the overlapping competencies of national and local actors will create conflicts about who's in charge of a public health emergency caused by a bioweapon. While national and local authorities struggle to figure out who is in control,
the epidemic spreads to other local areas, and the who’s in charge comedy of errors begins all over again.

In addition, a federal legal structure will create cumbersome decision-making processes in which national and local government entities and personnel need to participate. Can you imagine, Dr. Evil, trying to control a public health emergency through an ad hoc committee process operated by conference calls among the relevant national and local actors?

Second, your ideal legal target would be a federal system that has placed public health powers predominantly at the local level. If local and state governments possess the bulk of public health powers, legally and constitutionally, then the fragmentation of a federal system is exacerbated in the context of a public health emergency, because the main responsibility for protecting public health will be at the local and state level, not the national level. With public health powers vested primarily in local and state governments, defenses against bioterrorism are only as strong as the local government’s commitment to public health. In addition, with public health powers at the local level, there is more room for diversity and difference across the nation, which undermines a harmonized or coordinated approach to the public health emergency. A chain is only as strong as its weakest link.

Third, your ideal legal target should manifest a long, historical neglect of public health law concerning infectious diseases. Such neglect will signify first that local public health officials and their legal advisers, if any, will lack familiarity and competence with the powers that they have. And, secondly, the laws on the books will perhaps not have kept pace with the changes in public health and legal principles, making them difficult or perhaps even inappropriate to apply in an emergency situation.

Fourth, I would target a legal system that has not adapted the emergency powers of local and national governments to the specific challenges of a bioweapons attack. Local and national governments have emergency powers that would allow them to respond to a public health emergency in the case of a bioweapons attack. But if the governmental authorities have not adapted such broad emergency powers for the unique crisis a bioweapons attack would create, then the exercise of those powers will work to your benefit, Dr. Evil, by allowing ill-informed judgments and political panic to make the government look inept. Faith in government collapses and civil chaos begins. Equally important is the fact that the existence of broad emergency powers lulls officials into complacency that they have sufficient legal authority to respond to a bioweapons attack. Complacency, then, is the unwitting companion of chaos.

Fifth, you want to locate a legal system that has approached emergency planning for a bioweapons attack by lumping bioweapons together with other weapons of mass destruction. Locate a legal system that has appropriated money and personnel to train firefighters and police to respond to a bioweapons attack.
Six, your ideal target would be a legal system that emphasizes individual rights and restricts governmental powers to impinge on such rights. In such a system, the citizenry is wary of government incursions into its rights, creating a climate of distrust that works against governmental efforts to contain an epidemic. In this climate, citizens may well ignore government orders concerning isolation, travel bans, compulsory treatment, and quarantine. Such behavior will force the government to escalate its efforts to contain the epidemic, which might involve using military forces to enforce or implement public health measures. Escalation of this kind will fuel citizenry distrust of the government even more, particularly if the heavy-handed governmental tactics fail to stem the spread of the epidemic.

Seven, I would find a legal and political system that has neglected its public health infrastructure and personnel for decades. Such neglect works to your advantage, Dr. Evil, in two ways. First, the public health resources will be insufficient to handle the emergency created by your microbe. And, secondly, when local and national governments exercise their legal powers, they will realize that they have insufficient resources to implement the legal authorities that they do have. Imagine, for example, local and national governments exercising their powers of quarantine, only to discover that they have inadequate resources, personnel, training, and expertise to implement the action. People forget that the rule of law goes beyond and must go beyond merely having legal powers on the books. The legal power to act in the public good must be supported by resources, personnel, training, and equipment to undertake effectively the legal authority that exists.

When Rumpole finishes, Dr. Evil has only one question. Rumpole, the Malevolent, can you identify a legal system in the world today that has all of the characteristics you describe?

Now, as a lawyer, my fictitious conversation between Dr. Evil and Rumpole, the Malevolent, scares me as much as fears of doomsday microbes engineered in the laboratories of loony scientists. The legal vulnerabilities of the United States, though, by a terrorist attack are the same whether a traditional bioweapons agent or a doomsday microbe is used.

Further, some of the weaknesses of the American legal system in connection with bioterrorism, such as federalism and the protection of individual rights, constitute pillars of the rule of law in the United States that cannot be abandoned. As a country dedicated to the rule of law, the United States structures responses to national security threats through legal frameworks. Bioterrorism does not, however, fit within the two prevailing legal frameworks for dealing with national security threats. The first framework structures United States responses to national security threats from foreign states. Because the Constitution vests in the federal government the power to provide for the nation's security against other countries, this legal framework is unitary in that state governments have no role in countering threats from foreign nations. The second legal framework that shapes United States responses to terrorist threats -- crudely speaking, counterterrorist legislation in the United States reflects a law enforcement
model. Federal law enforcement officials are empowered to prevent acts of terrorism and to apprehend and punish perpetrators.

While terrorist acts do affect state governments and legal systems, counterterrorism is predominantly a federal affair. Neither of these frameworks applies well to bioterrorism. The gravest threat from use of a biological weapon is a public health threat. Under the Constitution, state governments, not the federal government, have primary responsibility for public health. This allocation of public health authority makes state governments and legal systems critical in preparing for and responding to national security threats from bioterrorism. This country has never developed a legal framework for national security in which state governments are more or as important as the federal government.

The complexity of the legal challenges posed by bioweapons deepens when one considers the diverse areas of law that bioterrorism would bring into play. The current slide highlights at least five different categories of law that all feed into the legal challenge posed by bioterrorism. This complexity, particularly the presence of public health law, underscores the inappropriateness of traditional legal frameworks for responding to national security threats.

Now, the key message to take home is that the United States needs to formulate a legal strategy as part of its efforts to bolster its defenses against biological weapon. In the context of bioterrorism, the American legal system is a complicated mechanism that is at present unprepared to deal with a public health emergency a bioweapon would unleash.

In the remainder of my time, I would like to sketch one approach to crafting a legal strategy to support bioweapons defense. The first step is to identify what functions we want law to fulfill. I believe that five essential functions can be identified. First, deterring individuals, groups, and states from developing and using bioweapons. Secondly, preparing governments and private enterprises for a bioweapons attack. Third, empowering governments to respond effectively to public health emergencies. Fourth, discipline the exercise of government power in public health emergencies to ensure individual rights and freedoms are respected to the fullest extent possible. Fifth, facilitating government efforts at attribution of biological weapons attacks and retribution against the perpetrator.

Now, as the current slide shows, the public health threat model connects directly to all five of these functions of law. While the traditional national security and law enforcement frameworks have only limited application to the functions, law should serve in defense against biological weapons. Now, under each of the five functions that I've mentioned, there are many, many different specific legal problems and issues that arise. Dr. Hamburg mentioned some of those this morning in her talk. I don't have time this morning to discuss in any level of detail these specific issues, but you will in my written paper find a long list of the specific legal issues that fall under each of those five
functions of law. So if you're interested in that level of detail, I'll point you to my written paper.

The second step is for each of the functions of law that I've identified to do the following things. First of all, identify applicable laws. Secondly, interpret the relevant laws to evaluate whether they provide the needed authority for responding to the threat by bioweapons. Thirdly, modify existing law, or, if necessary, create new law to strengthen the legal regime against bioweapons.

Fourth, coordinate legal authorities, first of all, among departments of the same governmental level, and, secondly, between the federal government and the state governments. Fifth, implement the legal authorities through adequate funding, personnel, training, technology, and equipment.

Now, the five functions of law and the five objectives can be combined in a matrix that might be useful in structuring a legal strategy for strengthening our defenses against bioweapons. I attempt in the current slide a very, very crude evaluation of where we stand today in terms of fulfilling the five objectives for each basic function of law. Green circles indicate that the objective has more or less been achieved. Yellow circles indicate that incomplete progress has been made. And red circles indicate little or no progress. Overall, the matrix suggests the United States is prepared -- unprepared, excuse me -- legally for a bioweapons attack.

Undoubtedly, people with more expertise than I have would complete this matrix differently, with more or less pessimism than I have expressed. Or other experts would construct different kinds of analytical matrices that would be more sophisticated than my crude attempt here today. But it is precisely these kinds of debates and that kind of dialogue which are needed to advance a U.S. legal strategy against bioweapons.

The need for a legal strategy to bolster U.S. national security against bioweapons is manifest, and it deserves the attention of the highest levels of federal -- of federal and state governments. A legal strategy is necessary. But, please, it is not sufficient to protect the American people from the threat of bioweapons. We will never outlawyer the threat of bioterrorism, but we will not be smart in engaging in the battle against biological weapons without acknowledging that our vulnerability to these weapons stems in part from the structure, the substance, and the current state of the American legal system.

It is time to make the rule of law a weapon rather than a weakness in confronting the specter of biological terrorism.
Thank you.
(Applause.)
Understanding Media's Response in Epidemics

DR. INGLESBY: Our last speaker this morning is Laurie Garrett, also well known to many of you. She is the only writer ever to have been awarded the three big Ps of journalism -- the Peabody, the Polk, and the Pulitzer. She studied biology as an undergraduate at Santa Cruz, and then as a graduate student at U.C. Berkeley. Began her media career on radio, and then produced documentaries which began to win many awards. She quickly moved on to NPR, where she also won numerous awards. Has been at Newsday for more than a decade, interrupted briefly for a stint at the Harvard School of Public Health, and she has written a number of books on infectious disease and public health, including her most recent book "Betrayal of Trust: The Collapse of Global Public Health." Her talk is entitled "Understanding Media's Response to Epidemics."

MS. GARRETT: Well, I would say -- I would do the trick of saying stand up and stretch, but then we’d really be in a mess, and we’re so far over at this point. So, instead, I’ll just try to be really fast. And I think I wanted to say thanks to Tom and Tara for bringing me here, but I don’t know if I should say thanks, because I think I have the thankless task of this entire meeting -- meaning defending the media.

(Laughter.)

MS. GARRETT: And I think, first, what makes that hard is what you folks seem to think the media is. Let me provide a few quotes from the last 24 hours.

(Laughter.)

MS. GARRETT: Jerry Hauer said, "The whole issue of dealing with the media when it comes to bioterrorism is something that has really been ignored. The media is either going to be an ally in getting information out or a foe in increasing panic."

George Poste, "Dealing with the issue of how media responds to imposition of quarantine barely merits consideration."

(Laughter.)

MS. GARRETT: CSIS, the Center for Strategic and International Studies, released a report just about a month ago called "Contagion and Conflict," and in it they say -- and I think this is something you should all think about very carefully. They are speaking in the international context, but I think it would apply to any locality. "Good information is the foundation of good policy, and addressing problems at the intersection of health and security must include efforts toward bolstering both the quality of and the transmission mechanisms for health-related information that may have security implications."

Amy Smithson spoke to you yesterday, and she wrote a report that I had hoped was actually going to be the subject of her talk because it's something I hope all of you get a chance to read, "Ataxia." But there are a couple of quotes I need to lift from that report.
She said, "Promptly establishing a perimeter is important to hold the number of victims to a minimum and enable rescuers to do their jobs without undue interference. News crews monitor the emergency communications frequencies and could quickly get to the scene, sometimes even before key response squads.

"Continuous live television broadcasts of the Murrah Building in Oklahoma City began 12 minutes after the April 1995 bombing. Some reporters would view such a disaster as a career-making story, and might be willing to do practically anything to obtain spectacular images or insider interviews for live reports.

"The media's behavior could jeopardize their own health and also impede rescue operations in the early moments critical to victims' survival. Citizens who believe that family members or friends could be victims would also have to be kept at a safe distance."

Also, in the report she states, "A well-coordinated media game plan will be essential to reassure the public and attempt to manage the crisis. Even with careful media relations, public health and emergency response officials anticipate a widespread panic of the kind inspired by Orson Welles' 1938 War of the Worlds radio broadcast, except much, much worse."

Marcie Layton told us, in commenting on the West Nile Virus outbreak, that, in fact, on balance most of media coverage had not been bad in New York. She did say that, "There were some attempts to politicize the outbreak by the media."

Martin Hugh Jones told us regarding PROMED that much of PROMED's information actually comes from the media. And when they have done an accuracy test, they found that 1.7 percent of the official reports from governments were retracted, and 2.6 percent of news accounts proved incorrect. That implies that more than 97 percent were, in fact, correct.

He also said, "If you get it out first, you are then in charge of that news stream. If journalists get it out first, you're not."

Dr. Rodier told us that 25 percent of the information that reaches WHO in a timely fashion comes from government sources and field laboratories. The remainder of timely information comes from the media. And he said, "I think it's almost impossible to beat the media."

So, what's the bottom line here? Well, from the point of view of public health, it seems your bottom line is that the media is either an enemy or a troublesome fool that needs to be coddled into dispersing helpful information against its better wisdom.

It also seems that, from your perspective, media relations are at the bottom of your list. It seems to be the last thing you give serious consideration to in your planning. And as
you noted, it was not really part of the Top Off report. It's not been part of most of the exercises I have viewed that any of you have staged.

It's also interesting that, as a group, public health practitioners and national security people think very, very differently about media when they speak in international terms versus domestic. In international terms, you think media is very good. You think they are part of transparency. You think that they promote democracy and that the presence of a strong media means you may be working in a country or with a country that will be more cooperative and interested in the needs of the general public. But, domestically, you see media as pests, liars, sensationalizers.

So Dr. Glass gave us some very interesting comments. I want to comment them 100 percent. I don't know how many of you have quite this track record, but I have personally been in the middle of several epidemics, in the middle of three major earthquakes, in the middle of one major volcanic eruption, a victim of the largest fire in the history of New York City. And I will attest to, yes, there is an eerie calm.

And I will also attest to, in most cases I have observed, media response has actually been excellent. I was personally on the air live on a radio station in northern California when a large earthquake hit, and the epicenter was almost directly under the radio station. We went on the air and for three straight hours we said over and over and over again, "Remain calm. This is Richter scale whatever." We kept calling the scientific station to get the latest Richter scale numbers. "Do not call 911." We said that every five minutes minimally, "Do not call 911." We said, "If you're okay, go outside immediately and check on your neighbors. Check on everybody in your family. Help your neighbors." And we said, "If any part of your home or structure appears weakened by this earthquake, go outside and find an open area with no large structures or trees nearby and remain there with an AM radio or a transistor radio listening for further messages. Hopefully, at some point government officials will tell us that it's safe to return to our structures."

We then called government officials, every imaginable government office, for three straight hours, never getting anyone to agree to give us information, to go on the air, or to provide any consolation to our listeners. News today is a 24-hour cycle. You all know that, and you all know that it has increased pressure on everyone, regardless of what your occupation may be, to respond or interact with media in some way. Information points now compete against each other. So it's not about media competing against each other; it's about actual points of information competing.

We are all here today competing with Bush versus Gore in Florida, and every single news event and news cycle is competing against that as the dominant data point of our time. That will always be true. And, indeed, we currently have an ebola epidemic underway in East Africa getting almost no attention, particularly when compared to the level of attention Kikwit, Zaire, in '95, received. What's the difference? Competing data points. Competing information points. It is occurring at a time when the international attention, not just of media but of the public generally, is focused elsewhere.
Most real journalists care very deeply about their jobs. I'm not going to defend the scoundrels, and there are scoundrels in every profession. But most of us actually think accuracy is the most important thing. To be told that we've made a mistake in accuracy is like having a physician be told they left a scalpel inside the patient. It is of vital importance to us that we have accurate information. We try our best.

We also have families. And just as health care workers and health care providers are likely to be thinking about their own children and their own families in a crisis, so are we. And that is likely to also affect how we feel about the information we disseminate. In a crisis, media will also be thinking, am I going to unduly panic my own children? The school teachers that are taking care of them right now?

I find it grossly unfair to characterize journalists as award hungry, prestige hungry monsters, any more so than the scientists I have met who think of nothing but winning a Nobel Prize. And I think every profession has its scoundrels, its greedy, and its headline-grabbing jerks, but I don't think ours is particularly worse than many of yours.

We are ruled, however, and there's been a fundamental change that many of you have not perhaps taken note of. We are now ruled by corporate masters. It was not long ago, in the early days of my career, when almost all newspapers in this country were family-owned, when most radio networks were very small and were owned by, again, small family companies, when ABC, NBC, CBS were all owned by ABC Company, CBS Company. Every single media organization to speak of has been swallowed up by corporate monsters, and we now have been swallowed, and then that one swallowed, and that one swallowed, to the point where I'm now through -- my newspaper is now in its, what, quaternary stage of being swallowed by the ever bigger fish.

What that means is now our media information is publicly traded on the New York Stock Exchange and NASDAQ. And the pressures on all of our bosses are enormous. Newspapers traditionally in the United States turn a two to three percent annual profit. We are now being commanded to turn profits in excess of 15 percent annually; in some cases, more than 20 percent. It's almost impossible to do without sacrificing absolutely everything that news is supposed to be about.

The same is true in broadcasting. They've trimmed and cut. I know all of you complain about what managed care has done to the trimming, cutting, and downsizing of the health care industry. The exact same is true in the media industry as well.

And now we're competing against a new media that is a frontier, lawless zone, that is largely self-regulated and does not try to meet the same standards as we, and that's the internet. And that is now the 24-hour cycle, which is most observed by people under 30 years of age. In fact, the average young adult in this country no longer reads a newspaper. Surveys show they see no reason to subscribe to them, nor do they watch ABC, NBC, and CBS, which they consider old fogy news. Indeed, ABC, CBS, and NBC, as you will note, now have hemorrhoid ads more than almost anything else, and that's because --
MS. GARRETT: -- their viewers demographically are over 65 years of age. Overseas, my colleagues face a different set of challenges, particularly in the kinds of countries that you folks are all most concerned about as likely perpetrators of bioweapons use.

I was just a couple of nights ago at the annual honors banquet of the Committee to Protect Journalists, at which each year we select a handful of extraordinary reporters and editors from around the world who have stood up to jails, to imprisonment, to beatings, and to threats, in order to manage to tell the truth. In some cases, they have not survived, and we honor them posthumously.

This year, Kofi Annan and Ambassador Holbrooke both attended, with a very strong presence from United Nations contingent -- I think a strong recognition that, in the absence of a free press, you cannot possibly have appropriate communications and any hope of a democracy.

So let's start by respecting one another. Let's begin by having no self-fulfilling prophecies. If you assume we will be evil-doers, probably we will. If you assume that we have a real profession with real standards that we try to meet, and you appeal to that level of professionalism, it's likely that that will be the plane on which we will work together.

And don't be fools. If panic occurs, it will not be of media's making.

If I could have the first slide, please. I don't know. Yes, okay. I don't know if you can read this, and if it can be focused. I can't see it at all from here. But I think a little reminder is in order. I went through for my new book "Betrayal of Trust," and I went through the historical records of outbreaks in New York City, before the understanding of germ theory. And so this is starting when it was New Amsterdam and up through being New York City, through the colonial period and post Civil War. And the key thing to look at is the percentage killed. Now, you don't have to say the word "media" to imagine massive panic if you wake up one morning and realize that eight percent of the population of your city died in the last two months of yellow fever or of smallpox.

And, indeed, most of these epidemics that took these huge tolls were quite short and took place during the summer months because New York City was built on a swampy area with no fresh flushing water supply of any kind, and was prone to both outbreaks of malaria and yellow fever.

I also don't think it's going to take any amount of media attention to have public panic respond from quarantine efforts. As soon as quarantine signs go up, or any indication of isolation and quarantine, many, many people will indeed respond negatively. And it's not going to be because media made them respond negatively; it's going to be because Americans have very strong feelings about commanding other citizens to be sequestered. And because the mere notion that we, as a social grouping, have decided
that we need to sequester a certain membership amongst us signals a higher level of threat and cause for concern.

As has been mentioned, in 1947, we did have a small pox concern in New York City, and at that time New York City managed in less than 30 days to vaccinate more than six million people, and that included rapid manufacture of additional supplementary vaccine supplies done by the New York City Department of Health itself. There was no mass level or even minor level of objection to the effort. The media wholly collaborated; and, in fact, the editorial boards of all of the major newspapers in New York sat down and met with the Commissioner of Health and mapped out strategies for convincing the populous to voluntarily undergo what became a very smooth mass vaccination campaign.

Of course, there was a time when all of you, and anyone in public health, garnered a great deal more respect and was seen a bit more heroically than you are today. And we could spend a lot of time talking about why that change has occurred, but that's another story. You would find actually, if you looked back into the records of 1960s, 1970s, there was a time when many elements of the media acted like cheerleaders for public health; really, waving the banner, seeing you as great crusaders.

But I think that as soon as we face a situation where the public sees an image like this, this is a child with small pox -- when members of the public simply see the image, it's not going to be about any commentary media makes, but the mere fact that the photo is presented, the video is presented. It's hard to imagine that there won't be a panic response.

When I show this slide to undergraduates, usually I hear a loud outcry from the audience. Oooh, oh my God, oooh. Just seeing the picture as a hypothetical, historical photograph of small pox is enough to get most of young people quite freaked out. If it were a contemporaneous photograph of someone in their community, and this went either on television or as a still photo in the newspaper, I guarantee you there would be panic, and it wouldn't be because the media made the panic, but rather the media told the community what was going on and showed it to them.

Now, I don't know if you can all see this, but let's step into the present for a moment and look at some real causes for concern and how the public and media are responding to them.

Amy Smithson did give us an important talk yesterday on the other subject that she has written about extensively; namely, what’s going on in the former Soviet Union countries with the sort of post Bio Preparat Era. And a great deal of this has now been publicized. The public, at least if they paid attention, they have the information. They know about this massive biological warfare program. Some of them may have seen our images in Newsday or other news organizations' images of what actually transpired, and they may know that small pox was being made and that very horrible viruses are stored at this site and could conceivably be in the hands of terrorists or be loosed upon them in their
community at some later date from what actually now looks like a pretty primitive facility out there in Siberia. Have they responded inappropriately? Has there been panic? No. If anything, it has assisted all of you in gaining attention in Washington.

When plague broke out in Surrat, India, in 1994, there was a terrible set of reactions, horrible, and I want to quickly run them down. I know time is short, but I think it’s important because I’ve heard some misstatements. I was in the middle of this epidemic, and I witnessed it, so I would like to correct the record.

First of all, what happened in that community is that every single private physician and pharmacist fled town. They just locked up the hospitals. They literally threw patients out of hospitals, private hospitals, and left town. When the public realized that all of the doctors were fleeing, they said, "Something terrible must be going on here," and an exodus began. Then, a federal government official in the Ministry of Health in Delhi misinformed the BBC, saying there was a mystery virus loose in Surrat. The BBC, which is the voice of God in India, went on the air and said, "There is a mystery fever in Surrat." Mass panic; 400,000 people fled the city.

What was left behind were extraordinarily acute antibiotic shortages. They ran out of tetracycline very shortly. The pharmacists had split town and locked up their supplies, and so they couldn’t even have the alternative of getting into local supplies. However, panic did not cause people to break down the doors, as most of your scenarios show, raid the pharmacies, and steal supplies. There was no lawlessness. This did not occur.

All care was handled by a tiny staff in the government hospital. They were thoroughly exhausted and personally terrified. When I reached there, many of them were wearing three masks at once and could barely breathe, but they were so frightened and so exhausted, and had worked around the clock for days on end. There was little control of family members who milled about the hospitals at will. Most of the neighborhood that was -- that the patients came from, the Ved District, was the poorest part of the city, and it was the place with the highest concentration of plague. And these were the people unable to be part of the exodus and flee because they had no money. Finally, the laboratory capacity was virtually null set. They did observe the classic safety pin structure through their light microscope but had inability to do much else.

I don’t have time to say any of the rest of my remarks. It appears that we have to cut at this moment. So rather than go through the ebola epidemic, lessons there, and the West Nile epidemic, lessons there, and future slides, let me just make my key summary points.

If you assume the media are jerks, we will be. That was the assumption made in the ebola epidemic in 1995. Fist fights did break out between scientists and media. Some of the media did truly misbehave themselves, and some of the scientists did truly misbehave themselves. In contrast, lesson learned -- WHO now has a field media officer on-site in Uganda during that epidemic. There have been no problems to date associated
with inaccurate reporting or conflicts between media and public health officials in that area.

Second point. News is now a grinding job with high profit expectations. Reporters will do well if you offer help and assistance. If you build it, they will come. If you have a valid information source that is readily available and easy to get to, with openness and facilitation, it will be utilized. And they will not go for scurrilous facts elsewhere.

Three, if somebody releases a small anthrax say mini-event, targeting a particular office or family, and a few people get sick, it's very doubtful to me that you will see any panic or any hyperinflated media response. You may see a lot of anger -- anger directed at the mystery person who carried this out, anger directed at any inadequacies seen in law enforcement and public health response.

Number four, if a large release occurs, there will be panic -- make no mistake about it -- but it won't be media that created it.

Number five, ameliorating panic is the same as showing that you are in charge, that you have a game plan, that you are in control, that you know what you're doing, that you're providing regular streams of up-to-date, valid information. And more important, perhaps the most important thing, the longer things drag out -- and I think this is a key difference between what Dr. Glass and Dr. Osterholm were presenting -- if you're looking at a very short-term level of concern, both from the media and the public, I do think a relative calm sets in. But over the long haul, as a problem continues, as it seems to be unresolved, then you will start having the accusatory fingers pointed at you, and the demands for answers, and public anger.

Number six, media are people. They will be just as worried as you. They will be just as panicked about their families as you.

Number seven, don't tar the whole industry with a Matt Drudge brush or a National Enquirer brush. As Martin Hugh Jones told you, nearly 98 percent of the media outbreak reports to PROMED have proven to be accurate.

And, finally, public health is a trust. That's all it is. It's a trust between government and the public it's supposed to serve. The media can be that bridge, keeping that trust intact. Or you can ignore that media, or make assumptions about that media, and that bridge will not be there for you.

Thank you.  
(Applause.)

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Panel Discussion
**Epidemic Response Scenario: Decision Making in a Time of Plague**

Dr. INGLESBY: We now begin the portion of the program entitled "Epidemic Response Scenario: Decision Making in a Time of Plague." The objective of the scenario that we will present is to illuminate what we believe are three of the most critical and complex issues that might arise in the management of an epidemic following a biological weapons attack on civilian populations. These three issues are: scarcity, containment of contagious disease, and decision-making processes. By scarcity, we mean conditions, even if local or temporary, which limit or constrain the availability of essential, potentially life-saving resources such as health care professionals, antibiotics, vaccines, equipment, or other logistical capabilities. By containment, we mean a spectrum of measures that might be used to limit the spread of contagious disease. These measures range from the use of simple surgical masks to isolation of infected patients, and range to travel advisories, prohibition of public gatherings, mandatory immunization, or forced quarantine of entire areas. And by decision-making processes, we mean those that deserve attention because a bioweapons attack could force collaboration among a diverse array of individuals, organizations, and professional communities, who do not typically interact.

The format of the morning -- of the rest of the time will be, first, a few facts on plague; then, introductions of the remaining panelists that you do not now know; and then I will read the first segment of the scenario, and we will begin discussions. Dr. O'Toole will lead the conversation.

Let me start, actually, with introductions. First, each panelist has been asked to assume a very specific role for the exercise and to rely on his or her judgment and experience to react to the scenario and make necessary decisions.

We've asked the panelists to be as specific as possible and to do their level best to remain in their roles. Moving from left to right, you all know Jerry Hauer from yesterday, Michael Osterholm, Ken Bloem. Steve Cantrill, fourth in the line, is Associate Director of Emergency Medicine at Denver Health Medical Center in Denver, Colorado. He is an internationally-renowned expert on disaster management. He was intimately involved in the Denver Top Off exercise, and he will play the role of emergency medicine physician.

Let me back up. Jerry Hauer will play the role of state emergency manager/director -- management director. Mike Osterholm will play the role of state health commissioner of the affected state. Ken Bloem will play the role of hospital CEO. Steve Cantrill, as you just heard, will play the role of emergency medicine physician. We come to the Honorable Jack Marsh, who is the former Secretary of the Army, former four-term member of Congress from Virginia. He was Assistant for National Security Affairs for Vice President Ford and served in President Ford's cabinet. He was Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict. He has numerous public service distinctions and awards, and serves on the National Gilmore Commission to the President and Congress, the Commission that is the advisory committee on domestic
terrorism. He is also a lecturer on terrorism at a local university. He will play the role of governor in this scenario.

Moving down the row, we have Jeffrey Smith, who is partner at the law firm of Arnold & Porter. He served as general counsel of the CIA and chief of the Clinton transition team at the Department of Defense in 1992. He is former general counsel for the Senate Armed Services Committee, designated by Senator Nunn to the Iran Contra Committee and Senate Select Committee on Intelligence. He has lectured and written extensively on national security and international law and is a member of the Council of Foreign Relations. He will play the role of national security advisor. Moving down the row, we have Laurie Garrett, who you well know from the last presentation. She will play the role of senior CNN correspondent.

(Laughter.)

I suspect she will do a good job of that.

(Laughter.)

Moving down the row, we have Assistant Secretary Hamburg, who you well know from this morning, who will play the role of secretary of HHS, not a far jump for her. And then, finally, we have David Fidler, who will play the role of state attorney general. And my esteemed colleague, Dr. O'Toole, will play the role of professional moderator, and she will be fairly direct in her questions and her lead -- her facilitation of the conversation.

Okay. A few facts about plague. Plague generally is regarded as one of the most concerning biological weapons that might be used. Time from exposure to a plague aerosol to the development of symptoms would be about one to six days. Persons would develop pneumonic plague, which is an atypical rare form of plague. And death would follow symptoms from exposure somewhere between one to five days after exposure.

Symptoms of pneumonic plague would essentially resemble other forms of severe pneumonia at first -- hematemesis, or bloody sputum; fever; cough; chest pain. Patients are rapidly ill and quickly would require intensive care units. The diagnosis of plague is not simple. It would require specialized testing at labs that know how to do this. There are no specific hallmarks of the disease, at least initially, so this would require some clinical suspicion of plague before specimens were appropriately sent to the right laboratories.

The treatment of plague -- plague is a treatable disease, if treated with the proper antibiotics. Unfortunately, some of the antibiotics that we would reach for to treat typical pneumonias would not be effective against plague pneumonia or pneumonic plague. Survival is possible with pneumonic plague if treatment is begun early.
Person-to-person transmission is possible by the respiratory route. Fortunately, we believe this is uncommon. However, we know it has occurred between close contacts in history. Simple masks prevent transmission, at least as far as we know. The evidence is limited. And there is no vaccine available to prevent transmission.

Segment one, the CDC has confirmed six cases of plague in Goodtown, an east coast city with a population of one million, a metro area population of 2.5 million. Over the past two days, an estimated 100 persons have died with plague-like symptoms. As many as 500 more have presented to hospitals and doctor's offices in Goodtown and surrounding East State with symptoms consistent with pneumonic plague.

All casualty estimates are considered highly uncertain. No common source of the illness has been identified. Since naturally-occurring plague has never been reported in this region of the country, a biological weapon attack is strongly suspected as the cause.

There is growing fear and shock in the city as word quickly spreads that "A weapon of mass destruction may have been used against the innocent civilians of Goodtown." All ICU and hospital beds in the city and surrounding towns are full. Ambulances are having difficulty returning to the volume -- or responding to the volume of 911 calls. Hospitals are reporting dwindling antibiotic supplies and are struggling to keep up with the flood of patients. They are urgently asking for more personnel and resources. Local and national media are reporting that plague is loose in Goodtown and that the health care system is struggling. The local newspaper headline reads, "Faceless Enemy Attacks Goodtown With Germ Weapons."

There is wide speculation on the location of the attack, the identity of the attacker, and the number of people exposed and likely to die. Media reports make references to the Black Death -- the plague epidemic that killed one-third of the population in Europe in the 14th century.

Good news. In modern times, antibiotics can treat plague. Bad news. The Black Death was mostly Bubonic, was not easily transmissible, whereas the Goodtown outbreak is pneumonic plague, which can be spread from person to person by cough.

The governor has called on his cabinet to draft a plan to pinpoint the source of the outbreak and bring it under control, and to address the emergent health care needs of his state. He has requested that CDC immediately release an antibiotic Push Pack from the national pharmaceutical stockpile to provide urgently needed antibiotics.

Lastly, Goodtown's plague outbreak is occurring in the context of a growing overseas crisis. A close U.S. ally is being threatened by invasion. The U.S. has pledged its support to its ally and is moving naval vessels into the area. Some commentators are linking the apparent bioweapons attack with this international crisis.

DR. O'TOOLE: Dr. Osterholm, you are the state health commissioner, and you know at this point there are cases consistent with plague in 14 counties of the state, and patients
with a reasonable case definition in over 20 hospitals. There are no common exposures identified as yet, despite a hard press by your staff to find commonalities among the victims. What are you thinking now? And what are the most important public health directives to execute?

DR. OSTERHOLM: Well, first of all, I'm going to make the assumption right off the bat that it's some type of a bioterrorist event, because knowing the epidemiology of plague you wouldn't expect to see what you're seeing here if it was a naturally-occurring event as such. So I'm going to lean heavily towards that side.

I think the second thing is going to be is I'm going to be a middle person in a chain of communication that's going to become critical very quickly. And so I have to relate to my governor. And depending on which state you're from, it may be very important to whether your attorney general gets along with your governor, because that obviously is going to become an issue.

And right now, in my state, that doesn't happen very well where my governor gets along with his attorney general. So it's a situation where you have to be very sensitive to how the information flow is going, because often it's going to be the governor.

The first thing I would do is look at what resources I need to really understand what is happening, and how do I get those resources and identify them, as well as beginning to talk about how do we deal with the care issues and the containment issue.

DR. O'TOOLE: Dr. Cantrill, you are the chief of emergency medicine in University Hospital. Approximately one-quarter of your staff are calling in sick for the third shift. You are seeing three times as many patients as you normally see. You've already admitted twice as many patients by 3:00 p.m. as you normally do. What are you thinking and doing?

DR. CANTRILL: Well, obviously, just trying to keep the hospital operational, and especially the ED and the upstairs services becomes the major issue. We've had multiple people who have called in sick, not only amongst the professional staff, but we have about one-third of our food service people. Two-thirds didn't show up. We have about 20 percent of our housekeeping folks that have showed up for work. So we have a real problem, not only at the professional level, but just the infrastructure level of trying to keep the hospital role in force. I've got my CEO, who is working on that for me right now.

(Laughter.)

DR. O'TOOLE: Mr. Bloem? Mr. Bloem, you are the CEO, and your head of emergency medicine is telling you that he is overwhelmed, he needs more staff and more resources. How do you know if the hospital is truly overwhelmed and whether or not you should call the state health commissioner or the governor and ask for permission to refuse to see further patients until you can stabilize the current situation?
MR. BLOEM: Well, the fact of the matter is there is no way that I’m likely to know in any definitive way. In fact, this is the early December season. Flu season has already begun. My hospital has been on bypass, meaning the ambulances from time to time are frequently rerouted from my hospital to other hospitals in the community. And now suddenly Dr. Cantrill tells me that we are on a state of bypass, but all of the hospitals are on bypass, or at least the red lights are starting to blink.

I’m walking the halls trying to talk with the chiefs of medical services, surgical services, Dr. Cantrill, and find out, can we continue? But it’s a little unclear. There are probably 40 or 50 hospitals in this metropolitan area of Goodtown, and presumably of the 500 patients that have shown up, 200 or so, let’s say, have shown up in doctor’s offices. I’m not ready yet to call the governor, but I’m getting real close to it.

DR. CANTRILL: We have a major problem, just with the number of dead bodies. You know, our death rate is normally about 1.1 a day. We’ve had 10 deaths in the last two days. Our morgue will only hold eight bodies. We have problems, really, all over, and we’re not talking about, you know, just bypass. I have right now 250 people in my waiting room demanding care. We’re starting to worry about institutional security here, and about the necessity to lock it down because they’re about ready to come over the counter, because they’re not being seen in a timely fashion. And I’ve got an exhausted staff.

DR. O’TOOLE: Governor Marsh, you are about to go onto local and national television live. What questions do you want answered before you face the cameras, and who are you going to call for answers to your queries?

MR. MARSH: Well, first, I wish my opponent had won his contest.

(Laughter.)

MR. MARSH: And, secondly, why am I hearing about this so late from my medical people? Because today, under the present scenario, crisis situations and terrorism -- terrorism is presumed to be a crime. And the lead federal agency is the FBI, so we ought to get them in here right away because they are the lead federal agency if, as it is perceived to be, that this is a crime. So I think we're going to have to get the FBI in here.

The people that I need also to hear from are my adjutant general. We need to get our press people in here to meet, because we're going to have to prepare some sort of a statement to --

DR. O’TOOLE: Your press people are all home sick.

(Laughter.)

MR. MARSH: Well, I’m not feeling well myself.
(Laughter followed by applause.)

MR. MARSH: Where is CNN now?

(Laughter.)

DR. OSTERHOLM: Well, I think at this point I would attempt very hard to lobby the governor to, first of all, hopefully have some faith in the Health Department; and, second of all, to dismiss this idea that he wants to go to his adjutant general as his lead consultant on this area. And I would try to convince him that this is going to unfold as a biological issue. This is what you can anticipate. And it's that old adage that you don't skate to where the puck where is; skate to where it's going to be. And I would try to tell him, this is what's going to happen tomorrow and the next day and the next day, and this is why you want to do what you want to do. Just don't react to the moment. And I think, actually, that would be a very important thing. And who wins that battle in the first 12 to 24 hours of information coming in is likely to set the tone for how much of the first three to five to seven days is going to go, and I think that's what this --

DR. O'TOOLE: Which battle is this now?

DR. OSTERHOLM: Pardon?

DR. O'TOOLE: Which battle?

DR. OSTERHOLM: The battle between who takes control of this situation.

DR. O'TOOLE: Okay. So we're at five minutes into the scenario and we've got a turf battle on our hands.

(Laughter.)

DR. O'TOOLE: Is that what you're saying?

DR. OSTERHOLM: I wouldn't say it's a turf battle. What I would try to say is that I think we, as a public health system, owe our elected officials hopefully a pre-outbreak review, so that they understand where it's going to go. But let's say we haven't had that opportunity. What we need to do is say that everyone will have a political role. So it's not as if there's -- all of us aren't going to be involved. But it's what is it you need, for what reasons, and when do you get them? And when you start talking about the issue of understanding what's happened, he wants more information.

Well, how do you get that? The Army is not going to go out, and the National Guard is not going to go get that. If you want to understand --

MR. MARSH: I have to take issue with you on that, because under the new structure of the National Guard in defense on biological weapons, there are capabilities placed in the
states with biological capabilities. They originally were called raid teams, but they’ve
gotten away from that name. But there are capabilities in the National Guard that are
being trained to respond to biological situations. Secondly, you have resource teams in
both the United States and the Marine Corps, and in the Department of the Army, and
in the Air Force, that can be made available to these types of situations. I’m not saying
that we have to use them, but your access to them is going to be through your adjutant
general, who will go up through his chain of command into the Office of Domestic
Support in the Pentagon, and into FEMA.

DR. O'TOOLE: Mr. Emergency Management Director?

MR. HAUER: Yes. In point of fact, our civil support team in the state we're in right now
is 22 people, and they have some moderate biodetection capability, but that's about it.
They still haven't gotten a field deployable PCR. So everything really has to work
through the Department of Health, from both an outbreak perspective, an
epidemiological perspective. We will be calling through FEMA, the Federal Emergency
Management Agency, requesting that at this point probably not C-birth, because C-birth
doesn't have the capability. But certainly we'd be requesting some medical support be
put on standby, because we don't know how far this thing is going to go. I'd be
depending on Mike at this point in time to rely on some potential casualty estimates. If
Mike was telling us and telling the governor that this thing could be just the tip of the
iceberg, that it would -- at this point in time it would be in our best interest to go
through FEMA and to go through HHS to get, one, MMRS put on standby, to get NDMS
put on standby.

To address Steve's concern about bodies, we would ask for a D-morgue team to assist
with management of fatalities. And those are the recommendations we'd be making to
the governor at this point in time. I'm not convinced at this point that C-birth would give
us any additional capability, because, again, this is not a chemical incident; it's a
biological incident.

DR. O'TOOLE: Okay.

MR. HAUER: C-birth doesn't deal with those quite as handily.

DR. O'TOOLE: Okay. Ms. Garrett?

MR. MARSH: If I can interrupt, he has pointed out one of the problems you have to deal
with, because in some states the principal emergency advisor to the governor is the
adjutant general. That’s, I think, in 22 states.
In other states, the adjutant general goes through another designated individual. But the
point he's making, you might do that in one state, but that might not be the route you
would follow in another state. So there is a need for a uniformity among the states on
how do you manage internally in the state these emergencies. They've worked it out
very, very well, but it's different from state to state. And based on the state authorities of
the governors, and those vary from state to state.
DR. O'TOOLE: Ms. Garrett, you hear rumors from your friends in the medical profession and long-time contacts in the Health Department that there aren't going to be enough antibiotics available in the next 24 to 48 hours to take care of all of the health care professionals in the city, and all of the public safety officials, and all of the patients who are already sick, let alone their contacts. Who are you going to call, and what questions are you going to ask, from among the people on this stage?

MS. GARRETT: Well, probably I already know that there isn't enough antibiotics because I've done my background work. I know from past epidemics and from all of the reports that that's the probable outcome. I will call the health commissioner, so I'm on the phone with Dr. Osterholm.

DR. O'TOOLE: Please have the conversation.

MS. GARRETT: He's not available.

DR. O'TOOLE: Oh.

(Laughter.)

MS. GARRETT: And I tried to say, "Look, this is Christina Amapour. Put him on the phone." But that --

(Laughter.)

MS. GARRETT: He is not available, and the press officers are putting me on hold, and so on and so forth. So I can't get the answer out of the Health Department. So I'm probably -- if I'm at CNN, I have a whole staff working for me, so I've instructed a whole bunch of these young interns to start calling pharmacies all over in Goodtown and find out if they have -- are we assuming it's tetracycline we're looking for, or cipro, or what?

DR. O'TOOLE: There's rumors it could be any of those.

MS. GARRETT: Okay. So I'm going to ask -- I'm going to have them calling pharmacies to ask, "How are you stocked with cipro and tetracycline?" I also am going to be calling HHS because I've heard somewhere in my piles of information and background, or something I checked on the internet, that there is supposed to be somebody at HHS that's responsible for stockpiling something or other. And so I'm going to call them up and say, "What the heck is going on?" And I'm probably going to be, again, going through a press officer at HHS, who is, again, going to say, "Well, I have to get back to you on that." And I'm going to say, "I'm on deadline." And they're going to say, "We're going to try," and I'm not going to hear from them for two or three hours.

DR. O'TOOLE: Okay. Madam Secretary, you hear reported on CNN about an hour and a half later that there is a shortage of antibiotics in Goodtown.
(Laughter.)

DR. O'TOOLE: What are your concerns at this point, and what do you do?

DR. HAMBURG: Well, I am pissed because nobody from within my organization has informed me that there is any kind of problem in Goodtown at all.

(Laughter.)

DR. HAMBURG: But I quickly contact my people, and I don't accept as an answer that they're not available. And I speak with the Director of the CDC, and the bioterrorism initiative director there, and also get the Director of the Office of Emergency Preparedness into my office to give me an update on what's going on, and to ask the question of what does our Department need to do now. Clearly, we're already engaged. We sent some people from the CDC I think, if I listened correctly, in the early stages of this. But the question immediately comes up about, can we do more, both in terms of our expert personnel at CDC and our laboratory capacity, to provide a confirmatory diagnosis and backup support?

Also, of course, the question of the stockpile. We have a crisis going on, and we have a limited supply of antibiotic. And we do have a civilian stockpile --

DR. O'TOOLE: Okay.

DR. HAMBURG: -- of pharmaceuticals. If I could just add one thing, there is an open question about when that stockpile can be deployed when there -- if the stockpile was created under the bioterrorism initiative, and we have not yet declared -- our suspicions are this is bioterrorism, but it's -- it hasn't formally been declared a bioterrorist event. My inclination, as a leading health official, is that there's a public health need, and we have a stockpile, and we're going to get that stockpile released if that's what the state officials want.

DR. O'TOOLE: Okay. Let's move on.

DR. INGLESBY: December 2nd, the next day. A day later, estimates are that there are now more than 300 dead from pneumonic plague in Goodtown and surrounding East State, a growing percentage of them children. An estimated 1,500 state residents may now be sick with plague. Firm numbers remain difficult to obtain, given the pace of the outbreak, and the lack of rapid and reliable diagnostic tests. Neither the location of the attack or the identity of the attacker have been discovered. State officials cannot firmly rule out that more than a single attack has occurred in Goodtown.

The media reports the story of four members of one family developing plague with two already dead. There is speculation that one of the family members passed it to the others. At the same time, it's also reported that there are insufficient isolation rooms in
hospitals to keep all of those with suspect pneumonic plague separated from other patients.

Some persons with plague systems are being kept in hospital hallways, wearing surgical masks. Others are reported to have been coughing in hospital waiting rooms and doctor's offices while waiting to be seen. Interviewed citizens of Goodtown report a growing fear of catching plague from others, and complain that the government is not doing enough to prevent the spread of infection. The media are also reporting that many people are beginning to leave the Goodtown metro area by car.

Some are leaving because of fear of ongoing attacks. Some are afraid of catching plague from a stranger. Some are in pursuit of antibiotics to protect themselves or their family members. And some are leaving in fear of possible civil disruption. Talk radio is reporting on fastest routes out of the city. A number of traffic fatalities have occurred in the exodus. Security has become a growing concern in Goodtown and East State. Sporadic violence occurring around hospitals and pharmacies has escalated with reports that vital antibiotics are scarce or not available. Antibiotic distribution centers require particular attention.

Meanwhile, on the other side of the country, in West State, 50 people have died of what appears to be pneumonic plague. And at least 200 are ill with plague-like symptoms. The analysis suggests a second separate bioweapons attack. There are also reports of 75 cases of suspect plague in 10 additional states. Most of these individuals had recently been in East State or West State. West State has now officially requested a delivery of the national pharmaceutical stockpile.

And, finally, the media reports that antibiotic supplies are being set aside for the protection and treatment of military forces. Navy ships continue to steam toward the shores of the beleaguered U.S. ally. Its threatening neighbor has increase its warlike rhetoric and is advising the U.S. to tend to its own internal disease matters rather than intrude where it is not welcome.

DR. O'TOOLE: Mr. State Attorney General, you have been told that there are not enough antibiotics to go around, and there is an argument going on between the state health commissioner and the state emergency management director, regarding how they should prioritize existing antibiotics. And there's another heated discussion that's ongoing that has to be resolved in the next five minutes, so that you can advise the governor with respect to whether or not force should be used to isolate people who are symptomatic and may be contagious. What is your advice to your colleagues in the health professions, and what do you suggest the governor be told with regard to forcible isolation?

MR. FIDLER: Well, my first -- I guess I have some political reactions first. I just returned from an ABA junket in Honolulu.

(Laughter.)
MR. FIDLER: I returned to my office, and I had absolutely no messages from either the health commissioner or the governor’s office about this, although this seems to be spinning out of control, particularly in connection with law enforcement issues.

And I think that the lawyers need to be brought into this immediately because this is going to trigger authorities that the governor has to issue. In terms of the priority in connection with antibiotics, I need instructions from my political bosses and the health commissioner as to how -- the proper way to ration the antibiotics. And then I have to go find some staff, who I understand most of my staff is home sick as well, to dig up whether we have any legal -- whether the governor or anybody has any legal authority to take those sorts of decisions. The only public health contact that I’ve had in my stay or my reign as a state attorney general is in connection with tobacco litigation. None of --

(Laughter.)

MR. FIDLER: None of my staff has any idea about these issues of containing infectious diseases. I also need instruction on the public health side as to whether compulsory treatment, compulsory isolation, is a proper public health policy in connection with this particular -- I have no idea. So I need some hard, clear, fast instructions, and then I need authority from the governor to dig up some lawyers, hopefully not literally, to help me --

(Laughter.)

MR. FIDLER: -- to help me figure out whether there’s sufficient authority for the governor to take the actions that he has got in mind. And I’m also concerned about state-federal turf actions. I’m hearing in the press that the state wants to call in the feds. I’m nervous about that because it’s the state that has the constitutional responsibility to protect public health. But I’m getting no instructions from anybody.

DR. O’TOOLE: Okay. Mr. State Health Commissioner, what are your thoughts on mandatory isolation and separation of family members?

DR. OSTERHOLM: Well, let me just say, if any attorney general really acts like that, I pity the state that elected him.

(Laughter.)

DR. OSTERHOLM: Because I think that that’s not the case. Typically speaking, an attorney general -- and to make this realistic -- typically will be in the loop, because the lawyers that represent state agencies are actually supplied by the state attorney general’s office. So even if you have a Republican governor and a Democratic attorney general, the attorney general’s office -- and I think that’s uniform throughout the 50 states -- so my lawyer is one of your employees. So that would have already been in place.

So I think that part of the issue is what he decides is what my lawyer is attempting to get him to support. And so where the real nub comes as to how we get antibiotics, or what
we do on this issue, is how you work it out at the state agency level. And I think that's true for city government. The city government lawyers -- I don't know if they come out of the city attorney's office assigned to agencies or if they are employed by the agencies, but it's a combination employed by the agency.

So I think that the point here is that, from a realistic how we're going to deal with this issue, hopefully this isn't unfolding as you just suggested. Having said that, I think how we're going to get the antibiotics is this is also a time where we've got to convince the governor, because the governor is going to be the air traffic controller in this situation in our state. We've got to convince him that he needs to have professionals dealing with --

DR. O'TOOLE: Try.

DR. OSTERHOLM: Governor, we --

DR. O'TOOLE: Have a conversation.

DR. OSTERHOLM: Governor, right now, you know, we're in the middle of a big crisis, and you're going to have to trust the professional staff you have around you, because it's all you've got right now. And what we're telling you -- and I would hope that the emergency management health commissioner should be like hand and glove working together.

And what we're telling you is we need to get the federal organizations in here, because this is the resources we're going to need. But having said that, we've got to keep a tight reign on them because of the issue of how it would mesh in with our system. Otherwise, they can kind of come in like the calvary and take over, so here is our plan. And I would come together with the emergency management person and try to devise a plan for federal interaction, send it to you, and then have you be the champion of it and carry it through, so that it has the weight of the governorship and you're trusting the emergency management and health commissioner to be the ones telling you what ought to be done.

DR. CANTRILL: And to make this realistic, though, in most places, most states, state health does not work with emergency management. They may not even know of each other.

MR. HAUER: I would disagree with that. When I was a state director in Indiana --

DR. CANTRILL: I said in some states.

MR. HAUER: Yes. In most of the states these days, particularly because of the interactions on things like the MMRS, not 100 percent, but there is good interaction between the emergency management folks and the state health folks. It's getting -- it has gotten better. I wouldn't have said that 10 years ago. Ten years ago, they didn't talk to each other. There was a total disconnect.
DR. CANTRILL: During Top Off, that was not demonstrated in our state, which we just may be a little behind the times. So that's --

DR. OSTERHOLM: I think the last 12 months. The last 12 months in this country one of the real pluses that has occurred is that there's still not a good working relationship in each instance. But I think there is very few states where the leading health -- public health people are not now working much more closely with the emergency management and vice versa. And I think that's been one of the real pluses since the last symposium.

DR. O'TOOLE: Governor?

MR. MARSH: I agree with that recommendation, because the time is now to start triggering possible access to federal forces, and I could do it in one of two ways. I can, one, issue an emergency declaration, or I can seek a declaration of the -- assistance under disaster -- disaster certification or an emergency situation. May want to go with emergency first in order to get them up and moving, but there are an enormous number of federal agencies that have to come up to speed on this. And there are some federal statutes from which there may be money. For example, the Stafford Act. But we need to -- we need to give a heads up to the federal system. It will make it easier if we do have to introduce forces. There will be a difference of opinion as to -- on quarantine and who has the authority for quarantine.

DR. O'TOOLE: Are you going to take the decision to make the quarantine -- are you going to make the quarantine decisions yourself?

MR. MARSH: In some states, the --

DR. O'TOOLE: You, now, here.

MR. MARSH: Right.

DR. O'TOOLE: Are you going to make the --

MR. MARSH: It depends on whether the -- it depends on whether the director of health feels that a quarantine is necessary. And sometimes in a state they have the authority to do it in conjunction with the governor. The governor does not have that authority exclusively. There is also a question that the federal government, under HHS and the CDC, can come in and impose a quarantine and bypass the state. These are vague areas of the law that need to be resolved.

DR. O'TOOLE: Mr. National Security Advisor, you now have governors of two states calling the White House, both worried that there are finite amounts of antibiotics in the national pharmaceutical stockpile, and both worried that their people won't get what they need. What are you thinking about now, and what are you -- you're about to see the President in five minutes. What are you going to advise her?
MR. SMITH: Well, actually --

(Laughter.)

MR. SMITH: Actually, I'm not about to see the President because yesterday I advised her that after seeing Laurie's report on CNN that I had appointed myself the head of the U.S. delegation for the negotiations currently underway in Paris on the preservation of important cultural properties.

(Laughter.)

MR. SMITH: And I left yesterday afternoon for Andrews Air Force Base.

(Laughter.)

MR. SMITH: Like my governor here, I would be happy not to have to deal with this. The question of making federal resources available to the state in this circumstance is, as everybody has said, very confusing. Fortunately, as the national security advisor, it's not entirely my responsibility. I would -- as the national security advisor, the first thing I would do is to put in motion several things. One is the responsibility is to find out, do we know if this is an intentional attack? And, if so, who did it? And for that I would convene a meeting requiring the head of the -- the director of Central Intelligence, the head of the Defense Intelligence Agency, the director the FBI, some representative of the attorney general, and others, to come together and to quickly get on top of it and find out what's going on, what degree of proof do we have.

I would direct the joint staff to begin preparing some sort of retaliatory response, and I would worry a great deal about the activities going on overseas at the moment, as to whether or not this is perhaps a diversionary attack, given the fact that U.S. forces are steaming toward a crisis. And one of the things I would also immediately worry about thereafter is, to the extent DOD resources are made available, or are going to be asked for by my colleague in HHS, if Peg is going to ask the Department of Defense to make DOD resources available, are they needed for overseas deployment? And, if so, somebody is going to have to make a horrible decision about whether these resources are used for domestic purposes, held in reserve, sent with the forces overseas. And we also have all of the press in the White House press room demanding to hear from the President, and the President is going to be under enormous pressure to speak to this issue immediately. So I've got about eight or nine things I have to worry about.

I neglected Congress. Nobody has mentioned Congress. Clearly, the administration will have to brief Congress to make sure that they are comfortable with what is going on, because everybody has said they don't like surprises. Congress doesn't like it either, so we'd have to bring Congress into it.
We would have to get the State Department involved to tell our allies about what's going on, because they're going to want to know. So it's -- I will be very wise to have gone to Paris.

(Laughter.)

DR. O'TOOLE: Did you have something?

MR. HAUER: Yes. While all of that's going on, we're sitting down here in Goodtown trying to manage this thing, and waiting for federal assets. We are now trying to plan through the next 48 and beyond trying to figure out what resources we're going to get. We've got to figure out about antibiotic distribution, and we cannot manage it on our own. We are in over our heads at this point in time. We do not have enough staff. We do not have enough medical staff in the hospitals. They are starting to burn out.

Steve and Ken are calling, asking for security in the emergency rooms. We have problems with crowds in the emergency rooms. Our police department is working 16-hour shifts. We have got to get some answers from the federal side. We've already got the National Guard providing the limited assets they can, but they really don't have any organic medical assets that we can use.

We've got to get the reserves in or DOD, and we're going to need to pretty quickly to understand what kind of federal assets are coming in, because we've got a major evolving crisis, and we're not getting any answers from the feds on what we can expect. And I understand there's another theater of operations overseas, but we have got to get some answers from the feds.

DR. O'TOOLE: Ms. Garrett, what are you reporting at this point?

MS. GARRETT: By now, at CNN, this is obviously -- when I talk about competing data points, there is no competing data point here. This is it. We've pretty much preempted covering absolutely anything else, giving only minor coverage. We've created teams, much as you have seen in the coverage of the Florida thing. You've seen team reporting. You've seen the legal teams. They come on there with their legal expertise reporting. Your political teams come on with your political, and so on and so forth. And we've got teams.

The first -- the primary team is, who did it? That team involves our national security/State Department reporter, our people who have sources at FBI and law enforcement. And we've already decided in the newsroom to take a quick look around the globe and see where we've got the biggest trouble spots, and we're aware because our DOD -- our Pentagon reporter has told us, that U.S. naval operations are responding and moving to a region where there's a standoff between a so-called rogue nation, a nation we've had a history of problems with, and its neighboring state, which is threatening to invade.
We're wondering if that might not be involved, and we've flown Christina Amapour over there. She's on her way now.

(Laughter.)

MS. GARRETT: And meanwhile, we are among those in the White House press room demanding statements from White House Press Office -- Press Secretary Jody Powell. And Jody is in a panic, and I can't get any information. She keeps saying, "We'll be updating you."

And we've got another team that is specifically deployed to Goodtown. They've been sent in. And since we know it -- plague is the agent, we've gone ahead and told them, because we've called our CNN physician and asked what they should do -- and they're prophylaxing with tetracycline. We're hoping that's adequate to cover our insurance policies to --

(Laughter.)

MS. GARRETT: -- make sure our reporters are okay. And we've also sent some -- a team out to the west coast. These people are broadcasting live. They're coming in -- Bernie Shaw and Judy Woodruff will say, "And now we go to Goodtown," and they're constantly, constantly updating, and constantly looking for footage, fresh footage. We've got film crews combing all over, trying to get pictures of people who are sick, of the hospitals, of beleaguered staff, of meetings, and we're constantly going back and forth between all of these.

Similarly, we've got our FBI reporter desperate to get Louis Freeh, or whoever it is now, on the phone or on camera. And we're thinking about -- we've got -- as part of the question of who did it, we've got at least one staffer who is doing nothing but monitoring the internet for traffic on all those sites where the wackos are. And we know the wacko sites, because we monitor them all the time.

(Laughter.)

MS. GARRETT: So now we're looking to see if -- you know, what the wackos are saying, if any of them look like likely candidates for having executed this event. So, basically, at this point, this is a massive news operation. Nobody is going to be going home early tonight or any time in the next few days. And we've got people in Washington, Goodtown, West Coast, and some neighboring major cities that are doing nothing but monitoring police scan and emergency radio transmissions. So we know absolutely every single thing you guys are saying.

(Laughter.)

DR. INGLESBY: On that note, let's move to Segment 3.
DR. INGLESBY: Across the U.S., there are now more than 3,000 dead. This is four days after the first plague case reported. Some 15,000 are sick, with symptoms consistent with this disease. There are cases spread throughout multiple cities in 15 states and in foreign countries.

In several cities, shootings have occurred over the distribution of antibiotics. In most affected states, the National Guard has been called in to provide for the secure distribution of antibiotics and medical resources and to ensure the continued safety of hospital operations.

The site of an armed military presence in U.S. cities has provoked protests about curtailment of civil liberties, but at the same time some governors are requesting additional support from the Department of Defense in the provision of supplies, personnel, and security. There is wide state-to-state variation and isolation policies and actions. In some states, anyone with symptoms that could be plague are placed in mandatory isolation under guard. Many are being boarded, treated, and isolated at hotels, because hospitals have been unable to manage the burden. So far, all persons forcibly isolated have been given appropriate medical care and received antibiotics.

Health and law enforcement officers have been asked to actively search for cases of plague. There are reports of persons violently refusing to submit to isolation or threatening violence when authorities attempt to separate family members. In other states, there have been no attempts to impose mandatory isolation, and voluntary isolation policies are still in effect. There is no way to assess whether mandatory or voluntary isolation has been more effective overall.

Like other states, each state is deciding whether to impose restrictions on public movement, including possible curfews; possible prohibition on meetings of more than a few people; possible closure of highways, airports, or train stations. The governors of non-affected states have called for temporary cessation of all traffic out of states with plague cases. Some states contiguous with east and west states have established highway checkpoints and are refusing entry to non-residents.

Internationally, some countries have stopped allowing the arrival of U.S. flights. U.S. warships are off the coast of its ally. The ally has been invaded. It is expected that the President will be making an announcement shortly regarding the possibility of a U.S. military response.

DR. O’TOOLE: Okay. I’m going to back up a little bit to the beginning of this segment chronologically. The confusion over who has authority to do what in Goodtown, and in East State, has delayed decisions about whether or not to institute mandatory quarantine or isolation procedures, home curfews, etcetera. The State Emergency Management Director, the State Health Commissioner, the Secretary of HHS, are now on a conference call with the governor, trying to advise you, Governor, as to whether or
not you -- it has been determined by the Attorney General that you do have the authority to institute curfews and isolation procedures of all kinds. And the question on this phone conference is whether or not these kinds of mandatory isolation procedures and quarantines are a good idea.

Would you four people please have this conversation? Dr. Osterholm, what do you think?

DR. OSTERHOLM: Go ahead.

MR. HAUER: Thanks. Well, I think the first issue is, can we enforce it? We certainly -- you know, if Mike feels and makes the recommendation that isolation of some type is necessary, the question I would have is -- you know, and I'd certainly defer to his judgment on the decision as to whether we need it. The question is: how do we enforce it? And to what degree do we enforce it? How much force do you use to keep people in their homes --

DR. O'TOOLE: Okay.

MR. HAUER: -- when people want to go out? And I'd certainly like to understand how we -- when we either use the National Guard, because they haven't been federalized so we can use them for law enforcement purposes at the local level, and our local police, how we can go about it. I think that's the issue we -- that I'd ask Mike and the Attorney General.

DR. OSTERHOLM: I think at this point, from the science side, it's going to require a kind of whole new way of thinking. And what I mean by that is that it's okay to be right and win the battle, but if you're wrong and lose the war it didn't really matter. What I mean by that is I may come up with the ideal plan for quarantine, for isolation, that meets all of the scientific rigors, but it doesn't meet the societal/political rigors of what we need at the time. And so I think what's going to really be important is to come up with something you can show that you can do and you do it well.

And one of the things we're going to have to get comfortable with, as a society and as a public health group and as a medical group, I'm sitting with colleagues right here right now that have never understood the concept of acceptable losses.

Now, a couple of colleagues farther down the aisle do, because in the military "acceptable losses" is considered a part of the norm. We're going to have to figure out, what can we do for isolation and quarantine that isn't forcible, so people recognize we're doing it, is going to have the most impact for the bang, and is not going to mean that we're going to get every one of them or that we're going -- we're going to let certain things go that we would ideally scientifically not let go. And we'll accept those as losses, and potentially people getting infected as a result of that and dying. But at least we're in charge. And right now, more importantly than anything else, somebody has got to be in charge.
DR. O’TOOLE: Governor, what would you like to know in terms of how you make this decision?

MR. MARSH: The problem that we're moving into here is a serious gap between federal and state authority. The governor has that authority for quarantine. He can control the traffic on the streets, and he can expropriate property. He can do all of those things. But in the field of quarantine, there is federal legislation that authorizes quarantine at the federal level. I think it's done through HHS and CDC, if I'm not mistaken. But there is a question as to whether it can preempt the state authority and do that. We are in a -- in this situation, it's so grim the governor, in my view, should go ahead and do it and argue about it later. But you have a situation where if the feds come in first and preempt -- now, I understand that the regs, that the quarantine regs, for that federal statute have not been finely promulgated.

And so what I'm saying to you, there is some very serious gaps, and that has been pointed out by other speakers here --

DR. O’TOOLE: Okay.

MR. MARSH: -- between federal laws for emergency assistance and also state laws.

DR. O’TOOLE: Okay. Dr. Hamburg, in the last three hours, the Congress has rushed through a law giving the federal government clear authority to impose quarantine on states over state authority. Under what conditions would you impose quarantine, and what types of quarantine would you be thinking about?

DR. HAMBURG: Well, I think the concept of quarantine, where you enclose a whole city or set of communities, is -- you know, theoretically, it would be nice to contain the disease; you could more effectively control it. But I think it is, just as Mike very eloquently just explained, just not a practical reality.

And as Secretary of HHS, I think I would be clearly striving very, very hard to do the right thing from a public health perspective, but also concerned about the political context in which it was going to occur, and trying to also think about a national perspective and recognizing that we already have two separate localities where these issues are emerging. We may have more.

We are not, as a nation, going to be able to really invoke multiple quarantines across the country and enforce it. We need to think about what makes sense to try to contain and control the disease as practically as possible, with very, very limited resources. We would have to take every single support person in Goodtown and the state to try to possibly enforce quarantine, and then we'd have all the issues about, how would we get the people food and, you know, care for them while we're enforcing it. And then, of course, you know, the images I think. If we didn't have panic before, I think we would absolutely have panic as CNN, you know, blasts out to the entire world, you know,
pictures of distraught mothers screaming that they can't get to their children who are across the town -- the state or county line, etcetera.

So I just think -- thinking about quarantine as an actual containment is a very limited utility. If you had told me there was an airplane that had just flown into the Goodtown airport, and there was someone on it with a known highly communicable respiratory disease, and the officials there didn't want to do anything about it because they thought it might interfere with tourism in Goodtown, I might suggest that quarantine there might be appropriate until we could identify what the medical problem was, treat the people who were affected and/or exposed, and then move on.

But here I think we have to think about more viable approaches to disease containment. I think clearly I would recommend or put in place bans on public gatherings. I would recommend people stay at home if they're not sick, would make recommendations about various sorts of restrictions of travel, but I would not try to impose a true quarantine in the sort of classical sense.

DR. O'TOOLE: Okay.

DR. OSTERHOLM: Tara, can I add an important point here? Because I think that there's an issue here that for the audience would be very helpful. The governor is wrong.

(Laughter.)

DR. OSTERHOLM: The federal -- unless you did pass this legislation in three hours, the federals do not have quarantine authority, other than people coming from outside the country. And it's --

MR. MARSH: There's a federal statute on it. But there is no regs?

DR. OSTERHOLM: There is not on state health quarantine. I know it --

MR. MARSH: Well, state. This is federal --

DR. OSTERHOLM: No. But I'm talking about at the state level where you can apply it. And my job, as a good public health practitioner, is going to be right now -- if there's an issue that I know, and I know it well, and I think all of the people in this audience -- part of the authority has to come from the bottom up, and it has to be manifest in someone like the governor. But we're not doing our jobs if we let the governor go off and make a mistake. And it's, in the long run, going to hurt us all.

So I think that one of the things we have to do is be empowered to say, what do we really know at our staff level jobs, and in that position there? And we may have to get into a -- you know, the governor is somebody I revere as my boss, but I'm going to sit here and say, "God dammit, you're wrong. And this is what you've got to do. And if you don't do it, then go find somebody else to do it."
DR. O'TOOLE: And your advice at this point is, look, we can't enforce a quarantine. We can't enforce a home curfew. We don't have any place to isolate people. The best we can do is give, basically, warnings and advice as to how the people ought to behave to protect --

DR. OSTERHOLM: And I've got to --

DR. O'TOOLE: Is that your advice?

DR. OSTERHOLM: And I -- yes. Well, it may be different than that to some degree, but what I'm saying is I've got to have a governor that's going to go with me, because either I know it or I don't know it. Either that, or hire somebody that knows it, but do that well before this happens. And the point being, though, is that we have to get our elected officials comfortable with it. So when the emergency management guy comes in and says, "This is what it is. You know, I'm a career guy. I know this stuff. And I'm telling you, what you're doing, you're going down the wrong path here." You've got to have our elected officials that can trust the people who are the professionals there.

And so I may argue with my governor behind closed doors and tell him, "If you do this, you're a fool." But the point is, he's got to have enough confidence in it to let it happen. And I think -- so I would really have disagreed with you vehemently on this quarantine issue because it would have diverted us off into something that would have been I think very injurious to the overall process where we're going.

PARTICIPANT: But you would not quarantine?

DR. OSTERHOLM: Oh, I would quarantine. But the feds don't have any authority or responsibility here, and --

DR. O'TOOLE: Now, wait a minute. I'm confused. You just said you'd quarantine?

DR. OSTERHOLM: No. It's that the -- as Peggy and I both said, it's a relative term. What do I mean by "quarantine"? Quarantine is when I take every person who has been possibly exposed --

DR. O'TOOLE: What do you mean by "quarantine"? You just said you would --

DR. OSTERHOLM: Well, I think in this case, clearly, for those people who are infected, and we have evidence that they may be infected, and they are coughing, we have to do something to move them out of the transmission mode. And we need to somehow isolate them. Now, the classic concept of quarantine -- and this is, again, for the audience -- where did quarantine come from? Quarantine didn't come from watching sick people. Quarantine came from watching ships coming into harbor that might have sick people who would get sick, and they would watch well people, and so there are still a lot of meanings to quarantine.
DR. O'TOOLE: Let me cut to the chase here, though.

DR. OSTERHOLM: Yes.

DR. O'TOOLE: We have expanding numbers of plague cases. We have not instituted any kind of isolation procedures other than advising people to stay home if they are sick.

DR. HAMBURG: Well, I thought we had already --

DR. O'TOOLE: Stay home if they are well.

DR. HAMBURG: -- implemented isolation procedures for people who were sick --

DR. O'TOOLE: Who were in the hospital.

DR. HAMBURG: -- outside of doors, and all kinds of things.

DR. O'TOOLE: Well, I thought actually -- that's what I was trying to clarify. I thought Mike had just changed the scenario to say that was --

DR. OSTERHOLM: No, I haven't changed it. I would try to do --

DR. O'TOOLE: Okay. All right.

DR. OSTERHOLM: -- those kinds of things. But classic quarantine --

DR. O'TOOLE: Okay.

DR. OSTERHOLM: -- is much more extensive. Like Yugoslavia was a good example of quarantine.

DR. O'TOOLE: We have to interrupt this because your argument with the governor is interrupted by a call from the national security advisor.

(Laughter.)

DR. O'TOOLE: Governor, the neighboring state is actually posting its -- posting National Guardsmen at the highways, preventing residents of your state from coming in for fear that they will spread the contagion. Mr. National Security Advisor, you are being asked to help the governor figure out what to do about this problem; plus, you are now worried about how this burgeoning situation in East State and West State might affect national strategic flexibility. What are you thinking? What is your conversation with the governor?

MR. SMITH: My conversation with the governor is that we really have a mess here.
MR. SMITH: And that the issue of whether taking the two facts that you've presented -- one is what to do about the National Guard in the neighboring states that are now seeking to quarantine you. I don't know, candidly, what the legal authority would be for a governor to call out the National Guard to do that.

But it does seem to me that you folks down there have got to get control of this real fast, and the idea that one governor would use the National Guard to block and protect his own state I think is politically unacceptable. And somehow or another we've got to find a way to work together and find a common solution to this that we all agree on and that requires leadership, not only in the White House but also among the governors. So I don't know what the answer is, but we've got to figure this out.

Secondly, with respect to the impact overseas, you're absolutely right. We have been receiving intelligence reports suggesting that this is, in fact, part of an effort to divert us from our activities in defense of our allies, and the Secretary of Defense and the DCI are saying to the President, "Mr. President, you've got a real choice to make here. How do you want us to proceed?" We don't want to be intimidated by the act of a couple of terrorists from pursuing our national agenda, because the signal that would send, not only to our allies but to everybody else around the world, that the United States can be easily diverted from its national interest by plague attacks at home. Now, admittedly, there have been a lot of deaths, but as of today we only have -- what do we have? 500 dead? 3,000 dead. Now, that's clearly a national tragedy, but your job is to think long term, and do you want us to -- because we don't have enough resources to do both the activity overseas and the activity at home, what do you want us to do, Mr. President? Madam President, I beg your pardon.

And my recommendation to you is to try to find some way to do both, because we've got to respond to the domestic situation, but at the same time we cannot let the United States be held hostage by these kind of activities.

DR. O'TOOLE: Okay. On that note --

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Admiral Stansfield Turner

Envisioning World-Wide Disarmament

DR. HAMBURG: I want to get started with this afternoon's session where we're going to be looking at the issue of "Setting Strategic Priorities: Health Professionals in a Belligerent World." We're going to begin the session, however, with someone who is not a health professional, but who has been a very, very important leader in the realm of intelligence and in terms of his leadership around issues that very much bear on how we can address the problems of terrorism in our society and contain such threats as the
nuclear threat and now the biological threat. His name is probably not unfamiliar to everyone in the room -- Stansfield Turner. He is a distinguished graduate of Annapolis, was a Rhodes Scholar at Oxford, and had a distinguished career in the military. In February 1977, President Jimmy Carter nominated him to be the Director of Central Intelligence, and he was responsible there for developing new procedures for closer oversight of the intelligence community by Congress and the White House. He led the intelligence community in adapting to a new era of real-time photographic satellites and instituted major management reform at the CIA, among his many, many accomplishments. On the completion of his duties at the CIA, in January 1981, President Carter presented him with the National Security Medal, an honor well earned. He has taught at Yale University and the U.S. Military Academy at West Point. He is on the faculty at the University of Maryland at College Park, and he is currently teaching at the Naval War College. He has written several important books on topics of great relevance. Secrecy in Democracy discusses the problems of conducting secret intelligence activities in our open democratic society; Terrorism and Democracy, which discusses how a democracy can respond to acts of terrorism without undermining its democratic principles; and Caging the Nuclear Genie: An American Challenge for Global Security, which I gather originally focused on the issue of controlling nuclear weapons, but he has now revised it and added a new chapter focusing on the biological weapons threat. He is going to be talking to us today to provide his perspective on that issue, how we can approach the issue of worldwide disarmament. He comes at it from a unique perspective, and I think will begin our afternoon session in a very, very thoughtful and stimulating way.

(Applause.)

ADMIRAL TURNER: Thank you, Peg. I want to say how pleased I am that Peg didn't tell you how Jimmy Carter came to appoint me as Director of Central Intelligence.

(Laughter.)

ADMIRAL TURNER: You see, I was not his first choice. When his first choice didn't pass muster with the Senate, he searched and searched the whole country for two weeks, and he looked for the most qualified man or woman around. He came up with me. The fact that we were classmates at Annapolis had absolutely nothing to do with it.

(Laughter.)

ADMIRAL TURNER: Now when D.A. Henderson called me and asked me to join you in this two-day conference I was excited, so excited that I didn't level with him. I didn't tell him about the dangers of asking a retired Admiral to speak.

(Laughter.)
ADMIRAL TURNER: You may have heard the adage in the Army, "Old Generals never die. They just fade away." Well, old Admirals never die also. They just keep on telling sea stories.

(Laughter.)

ADMIRAL TURNER: So if you think we’re going to keep this at 30 minutes, D.A., you’ve got another --

(Laughter.)

ADMIRAL TURNER: -- thing coming. The topic, though, worldwide disarmament of chemical, biological, and nuclear weapons, is one that can be handled very briefly. I don't see it. I don't see worldwide disarmament coming in anything like the foreseeable future. The world just isn’t ready for the kind of intrusive inspection regimes that would be needed to ensure against cheating.

You heard last night from Ambassador Butler the catastrophe we had in Iraq. Here we had the United Nations, its Security Council, with these various mandates to allow outside inspection to keep that country from having or developing weapons of mass destruction, and we've let it go. Great shame, because here was an opportunity for a precedent, a model that we could have established to lead us towards worldwide disarmament in this area. Now, if we can't have disarmament in the foreseeable future, the next best thing we can do is to ensure that nobody actually uses these weapons.

Now, the focus of this conference has been largely on what to do if they are used, and I understand that. This morning we heard some reference to deterring the use of these weapons, and I'd like to focus for a little bit this afternoon on three steps that I would suggest we should, as a country, consider in order to reduce the probability that anyone, a rogue nation or terrorist group, will invoke or use weapons of this sort. And one of these recommendations specifically points towards the medical and health care professions.

Point number one, the United States needs to establish a regime of punishments for the use of weapons of mass destruction. We don't want anyone thinking about using these and not understanding that there's going to be a price to be paid at some point. We didn't exact any price from Iraq when during the war with Iran, from 1979 to 1988, she severally used chemical weapons.

We exacted a very small price from Pakistan and India in 1998 when they tested nuclear weapons. We put on an embargo, but we lifted it very quickly when the grain lobby in the United States said, "We'd rather sell grain to these people than punish them for moving forward with weapons of mass destruction."

I think this does indicate that we have a good ways to go still in heightening consciousness in the United States towards this problem, because it's always going to be
difficult to get grain lobbies and others to forsake profit in order to discourage the use of weapons of mass destruction. But we've got to elevate that latter in the scale here in order to get ourselves into a better position the next time something like this happens.

I want to acknowledge, though, that it's got to be done delicately, because we can overexcite; we can over alarm people. I don't think it was helpful when the Secretary of Defense of several years ago put a bag -- 10-pound bag of sugar -- I think it was smaller than 10 pounds, but, anyway, a bag of sugar on the table on TV and said, "If this were anthrax, it could kill all of Washington, D.C." More alarming than informative.

I would suggest that we should, as a nation, develop, discuss, agree on, a range of possible punishments for the use of weapons of mass destruction. They would range from mild to severe. The point, though, is to have already had discussion on these, to have already agreed on the general scope of this before a crisis erupts, so that there is a consensus within the country that it would also, because we'd have a range of these, let us fit the punishment to the crime. And it would make it easier to ensure that the one we selected, or the ones we selected, would have broad public support, here and possibly in foreign countries.

Now, my list of what these candidates could be is not comprehensive, but let me just suggest. You could start with taking the country to the World Court. You could move on to cutting off World Bank and IMF funding for them. You could sever their airline connections with the outside world, not let their airlines land on our fields, not let our aircraft fly into theirs. We could embargo some portions of trade. And, finally, we could do a total embargo of trade. In any particular case, whenever we were ready to execute, we would try to persuade other nations, other responsible nations in the world, to join with us, and to exercise the same punishments. What would they have to lose? Well, they would have good relations with the country involved. They wouldn't be able to maintain those. But most of the countries that would think of using weapons of mass destruction are pariahs anyway -- the Iraqs, the North Koreas, and so forth.

Secondly, of course, they, too, would lose commercial opportunities, and this will be difficult to overcome. But, again, it depends on how well we've prepared the case, how well we've tried to condition international opinion as well as national opinion on the importance of deterring the use of these weapons. I doubt that we could do this by sitting down tomorrow and trying to negotiate some broad treaty because there would be too many compromises. There's too many uncertainties. There's too many indefiniteness in such a treaty. We've got to wait and do it on a case-by-case basis and bring together for each case an ad hoc grouping of nations that will exercise this power.

My second suggestion concerns ensuring that we have the best intelligence possible about the development and possible use of weapons of mass destruction. Now, there are a number of ways to get intelligence on any subject -- satellite photographs, electronic intercepts of signals and messages going around the world. And these can be useful, even in cases like something as easy to hide as development of chemical and biological weapons. But we generally look more in this area towards human intelligence, and it, of
course, is intended to be something where you can get right inside the other person's network and find out what they're planning to do.

Now, there are some difficulties in these kinds of situations, however. And let me give you an example. I was having lunch with a former CIA operative just a few days after Iraq attacked Kuwait in 1990. And we were reading criticism in the newspapers in those days that the CIA and the intelligence community had not predicted this attack. And people were saying we should have had an agent inside Saddam Hussein's inner circle to tell us what he was planning to do. Well, I said to my friend George, "George, what's the chances that we could ever penetrate and get somebody on the inside of a Saddam Hussein inner circle?" And George absolutely instantaneously put up his hand and said "zero." That's a tough nut to crack. But it doesn't mean you don't try. You never know when you'll just happen to make out.

But there's another approach entirely to human intelligence that we should not overlook in this kind of a situation. And this is the open contacts that go on all the time between U.S. citizens and citizens of other countries, even countries as hostile as Iraq, Iran, and North Korea -- their tourists, their businessmen, their academics, their professional organizations that have conferences, and such forth. Let me tell you a little sea story here. I warned you about too many sea stories, but I didn't tell you what a sea story is. A sea story is something a sailor imagined happened in his past and he now tells about with exaggeration.

(Laughter.)

ADMIRAL TURNER: In 1977, when I took over as Director of Central Intelligence, we had just completed a year's worth of examination of the CIA by two committees of Congress, a committee appointed by the President. And these investigations had come up with some activities of the CIA in the '50s and '60s which they did not think were appropriate. One of those was the use of American citizens in the course of collecting intelligence. And, most particularly, there was outrage that the CIA had used some U.S. media people, as well as academics, businessmen, tourists, and others.

I spent a good deal of time in my first few months in office trying to sort this out and establish what our policies would be in response to this considerable criticism. I ended up with the wrath of the media on me for a long time, because I refused to exclude the media totally. I said we would be cautious about ever asking media people to help us, but that we would not renounce it. They were American citizens, and they were patriotic, too. And if they might help us, I would be willing to call on them, and I did once when we had hostages incarcerated in Tehran. Well, amusingly, a few months after taking office I went to London to call on my counterpart, the head of MI-6. Much of the CIA's procedures and programs had been modeled on the British intelligence system, and so I was really looking forward to having my first conversation with this senior spymaster of all spymasters.
We went to his home for dinner. We sat down afterwards beside a fire, and I waited anxiously for what his advice to me as a brand-new novice in this field of intelligence would be. "Stan, are you tapping all the information that's available in the American business community?" I was shocked. Here was the spymaster of spymasters saying to me, "Are you using open intelligence rather than spies?" And he went on to say, "Well, look, there's no point in taking the risks and paying the costs of putting a spy into a situation if the information is already available inside your society. You've got to find a way to get it out, to pull it together." Well, this was logical enough. It obviously had to be tempered with the culture of our society as opposed to the culture of British society. But I took his point.

And I'm suggesting to you this afternoon that today intelligence on chemical warfare and biological warfare is a field where you, in the medical, health care, public health fields, can make a real contribution. You may have contacts with your counterparts abroad that could be very helpful. Yesterday, we heard from Amy Smithson that when she was interviewing Russians about biological warfare she learned that numbers of them were "teaching" in foreign countries. Well, knowing where those people were going, and what kinds of individual skills they took with them, are important clues to help us keep track of what's going on in biological warfare. There's not enough to make a case. There's not enough to draw firm conclusions from. But then you add them to another clue. A businessman comes back and finds out that Germany is selling centrifuges to Iraq, and you put these two together and you begin to build enough evidence to let you draw a useful conclusion and one that could lead to some national action on the subject. Somebody, of course, have got to be the collecting point and pull all of these together and collate them. That has to be the CIA. And they have to, if they haven't, set up -- and I certainly hope they have -- a body to do this, to be the collecting point.

Your organization, the Center for Civilian Biodefense, and other professional groups can be important contributors to this, help the CIA bring these fragmentary clues together from which you can pick -- put together a picture. Intelligence itself is really the art of doing picture puzzles when you've only got about 40 percent of the pieces of the puzzle with which to work, and you have to draw the whole picture. Now, it will always be controversial to bring innocent people into the spying business. But I would suggest to you, in this case, intelligence can indeed be our best defense -- our best defense against weapons of mass destruction being used. But it is a tough nut to crack, and it can't be cracked just with the ordinary intelligence processes

Thirdly, my last suggestion concerns nuclear weapons. There is one big difference between the way we deal with biological and chemical weapons on the one hand and nuclear on the other. We have renounced the use or possession of biological and chemical weapons as a country. We have not done so with nuclear weapons. In fact, we have insisted that we reserve the right to use nuclear weapons first if it seems to be in our interest to do so. I would suggest to you it will never seem to be in our interest to do so.
First of all, if we think about using a nuclear weapon against another country that has nuclear weapons, there is no way you can hope not to receive at least one nuclear detonation in retaliation. And I don't believe the American public would want to sacrifice any one city of the United States in order to achieve something overseas by our initiating the use of nuclear weapons.

Secondly, you may think about using a nuclear weapon against a non-nuclear state when you don't have to run the risk of retaliation. I would suggest here, though, that any use of a nuclear weapon, no matter what its size, would be disproportionate to the provocation, even to the provocation of an attack with biological weapons. I think we, the public, should urge the next President, whoever he -- or maybe she -- will be --

(Laughter.)

ADMIRAL TURNER: -- urge the next President to have a recount -- a recount --

(Laughter.)

ADMIRAL TURNER: -- a recount on this policy of preserving the right of the first use of nuclear weapons. There's a real benefit in renouncing that policy. It's the benefit of opening up the possibility of going to really low numbers of nuclear weapons. I'd like to make sure you understand that this afternoon somewhere in the United States arsenal there are about 12,000 nuclear warheads. That's a lot more than anybody in a right mind can possibly think of needing or using. And yet we are going down in increments that are so small it doesn't make a big dent here, and we have no plan today -- despite all you read in the newspapers about arms control agreements, we have no plan for the United States to have less than 10,000 nuclear warheads seven years from now. That's absurd. But as long as we have this fiction that we will order our military to use these weapons first, our military will understandably be reluctant to go to truly low numbers, because they want to be prepared to fulfill what we tell them to do. And they'll say there's this contingency, there's that contingency, that six more contingencies might arise, weapons might deteriorate. On it goes, and we will never get down to truly low numbers like a couple hundred warheads, which is, in my opinion, all we need for our national security.

Now, why would I raise this issue of reducing nuclear weapons in a conference on bioterrorism? It's because we need to keep our eye on three balls at once -- chemical, biological and nuclear. No one can predict which one is going to be employed, if any, so we need to be consistent in emphasizing our opposition to the use of any one of them. It's important that we not drive some rogue state or some terrorist group into thinking, well, they shouldn't use these kind -- this kind of weapon of mass destruction because we're going to retaliate and punish them for it, but we're not that anxious about this other one. And we drive them to using it. We must be consistent across the board.

I admire very much what you're doing in the Center. I admire very much what you all are committing by coming here for two days and discussing this important topic. And,
yes, this is an emphasis and a conference on bioterrorism, but I do urge you as we go forward to keep these three topics in balance because we must defeat the use of any of them.

Thank you.
(Applause.)

Scott Lillibridge, MD

Intentional Epidemics as a Human Rights Issue

DR. HAMBURG: Our next speaker is Dr. Scott Lillibridge. He is the Director of the Bioterrorism Preparedness and Response Program at CDC. That program was established to lead and manage the national public health preparedness effort for biological terrorism, and he came to that with a strong background in disaster assessment and epidemiology due to his service at CDC and the National Center for Environmental Health. He is a graduate of the EIS program, board certified in family medicine, and he's going to talk to us about a slightly different aspect of the problem than we've discussed so far. He's going to talk about intentional epidemics as a human rights issue. Scott?

DR. LILLIBRIDGE: Thank you. Well, let me just start off and say it's a pleasure to be here, and this has been a fine conference over the past two days hearing and meeting with old friends, hearing about new issues. And I've got to tell you, it's a pleasure for me to step out of the box as a program manager of bioterrorism preparedness and response and to begin to talk about another issue that I've wanted to address for some time. Thankfully, my agency director stuck out -- stepped out yesterday and provided the overview of the program, and talked about our progress over the last two years and some of our important partners.

What I would like to talk about today is the humanitarian assistance issue associated with bioterrorism preparedness and response. This is a little different than the billing, and they told me to take license and go ahead and speak my mind, so I'll take that as a charge to move forward. And maybe this will be a sea story, but --

(Laughter.)

-- at any rate, let me just go through this. I'd like to thank Dr. D.A. Henderson for his leadership and assistance to the bioterrorism initiative at CDC over the past several years, and also Dr. Peggy Hamburg, Assistant Secretary for Planning and Evaluation, for her leadership in the Department and helping us get our program moving on many, many occasions, and providing that essential coordination at the DHHS level. Thank you.
Anyway, I'm also proud of our accomplishments at CDC and working with our collaborators at the state and local level. One of CDC's collaborative organizations or activities that I'd like to really emphasize is that, as we move through the public health networks at the state and local level, and work with different constituencies, it has come to my attention that in the relief community human rights activists, and in the American Public Health Association, they have expressed humanitarian concerns over the past several years concerning bioterrorism preparedness by the U.S. Government.

In addition, from where I sit as program manager of the bioterrorism program at CDC, I can tell you that to fully galvanize the public health community we're going to need to have some concerns on the humanitarian issues that are so important in the implementation, in the saving of lives, and the curtailing of an epidemic at the state and local level. I'm going to tell these perspectives were honed through my experience in international humanitarian relief with refugees and displaced populations over the past decade and involved work in civil wars in places ranging from Rwanda to Liberia. As I look back, I remember that these were difficult places to work. There was little agreement concerning the optimum course of emergency programming. There was duplication of effort. There was programmatic confusion and a fair amount of rivalry between relief agencies.

In some cases, regional epidemics plagued the area of response in the wake of civil conflict. In one respect, you might argue this was the perfect training for a bioterrorism preparedness and response obligation that I obtained from CDC. Well, I'd like to state my case and begin to frame this, exactly what we do in public health and how this unfolds as we begin to implement this program. And in the second year of implementation, it's becoming clear that we need to shift the focus a little bit and continue to include issues of intelligence gathering, law enforcement, national security, but we must begin to think about some of the focus on treatment, controlling epidemics, and responding to the humanitarian medical needs of civilian populations. And let me just use this as case in point.

Let me go over the initial presentation that characterized our daily travail in one of the nation's few bioterrorism preparedness and response units located here at CDC. Over this weekend, late at night -- and many of these are late at night -- we were awoke or involved in a state that required assistance when another anthrax hoax was perpetrated.

And I've got to tell you, I'm really quite proud that over the time of the past year and a half, that we were able to mobilize. And I'd like -- wish you were in on these conversations. The FBI usually conducts a conference call. We're able to bring state and local health officers into the conversation, along with laboratorians from CDC, experts, people from USAMRIID, as well as different people from the management and bioterrorism program at CDC, and to through a quick threat assessment and review of the scenario. And I'd like to sort of characterize what we talk about and how these unfold, because it's so important in setting up the case that what we're doing is not purely intelligence gathering or defense work. We're doing some real honest public health work at the grass-roots level. The dilemma on this weekend was that samples that
were tested locally were equivocal, suggested the possibility that there might be a positive sample in an anthrax hoax. This is a new wrinkle, because, as you know, most anthrax hoaxes are inert and rapidly turned off at the state and local level.

Well, the conversation involved the transportation of lab samples, organizing lab coordination, dialoguing with state and local health officials to do the following: one, help them make recommendations; two, help them organize a lab strategy to rapidly turn off or get more clarity on this hoax event, or potential hoax event. And I can tell you that the conversation, 100 percent of this conversation, were on the health-related -- health sector related humanitarian assistance capacities that could be marshalled to help the state and local community make the diagnosis and treatment recommendations.

We are constantly talking about national security, national threats, biosensory research, a whole range of things in the bioterrorism arena. However, working on this full-time on a national program engaged in countless response activities, hoax events, planning exercises, I can tell you I spend almost 100 percent of my time on the health sector humanitarian issues talking about controlling the epidemic and augmenting medical services. That's a far cry from the way we've approached this in the past two or three years. The problem, from where I sit, or my standpoint, is that while the other sectors are extremely important and well developed and often well funded, that we, as a nation, are still viewing bioterrorism preparedness from a traditional law enforcement, defense, national security construct.

I am extremely pleased to hear during the content of the conference a number of alternatives to sort of vend the angles on intelligence gathering to look at new ways to work with law enforcement, treaty verification, and policing, or looking at some of the issues of monitoring bioscience. Those are extremely refreshing, but it has not been my experience over the past two years. While those sectors are important, I would like to say that consistently, if you sit down and you think about it, once a release has occurred in the population of a biologic agent, job one -- and this is really important because it helps organize the things that follow -- job one is to control the epidemic and do all of the things in detection and surveillance and lab that you need to do, control the epidemic, and augment health services at the local level to help address the humanitarian needs for the affected population.

In the absence of a proper consideration for the health sector humanitarian goals that ensured primacy towards these activities that are designed to save lives and prevent the spread of disease, our national decisions on spending, programming, and response seriously risk over time straying further and further away from the medical and public health exigencies or needs that would truly benefit populations once an event like this happens.

Again, not to minimize the prevention aspects of treaties violations, intelligence gathering, and preparedness in the military sector, but saying when things happen in
the civilian community I think the dynamic changes a little bit, and job one moves into epidemic control and augmenting medical services.

The purpose of my talk today is to point out areas in bioterrorism preparedness where the lessons in our humanitarian service or assistance endeavors in the health sector may provide some information on the future implementation of this program as it relates to the health sector. I have chosen a few topics that have very direct relations to the program that we have implemented over the past two years. They involve real examples, real dilemmas, real things that need to be solved at the state and local level if you're really going to save lives.

Now, the reason I'm sort of harping on this or staying on this is that no time in the last two years have I walked into an interagency meeting at a fairly senior level, or a major exercise, or a major drill, or a major discussion, where we sat down at the table and were advised that something had been released, and approached it with the question of, what's best to control the epidemic? And how can we save the most lives? Well, we have a lot of information on competing factions that may be in charge of different things. But, again, if we readjust the rheostats slightly to these humanitarian needs, I think it will help focus resources and to understand this in a different light.

I'd like to talk about, first, bioterrorism and epidemic preparedness. I think bioterrorism is a term that is most useful to characterize the threat or criminal activity in the security intelligence and military and law enforcement arenas. However, once an agent or a biologic agent is released in the population, what we do and what most closely relates to the kind of enterprise that we engage in in the health sector is -- epidemic preparedness and response is more descriptive.

Where does this kind of thinking lead to if you begin to say, "Describe what you do as epidemic response and preparedness"? It leads to decisions on the after-the-fact limb where investing in public health infrastructure and capacities at the state and local level may be critical to attain the humanitarian goals of saving lives and preventing the spread of diseases.

Now, that's extremely important if you're looking at the pie, at the very top of the pyramid, and beginning to divide the resources and build infrastructure and figure out which department, which activities need to be enhanced, which ones need to be modified. Sticking on job one, saving lives, I think that's fairly consistent and fairly important.

The second issue I wanted to mention is that, among all possibilities to develop in capacities in the health sector, the development of dual-use capacities in the public health sector that can be used during an emergency, but are honed during the routine times, are also extremely important. Now, George Poste mentioned about bioscience having an edge for the potential for offensive and defensive purposes. I'm talking about public health capacities of surveillance, laboratory activities, enhancing information,
and planning at the state and local level -- things that would be very, very difficult to use for anything besides public health activities.

The third thing that I want to mention -- and this is key, because at some point in time you have to look at what you're doing and say, "Are we getting the job done?" Because in -- we're in our second year. We're involved in serious implementation of this program, and I think the key question from the humanitarian standpoint would be -- has to do with the quality of our adjustment over time. As resources move into the state and local level, I think the key question is, are we better prepared at the local level to handle an epidemic and to augment medical services? The very area where the life-saving activities need to occur.

Remember that the federal government will come in somewhat later than the locals, will bring activities, people, consultants, but largely the survival would be determined -- what happens at the local level. So I think that's an extremely important way to begin to look at the summation of our activities. Again, not to minimize the contribution of the other sectors, but to say that what we do in epidemic preparedness or in the health sector has a humanitarian element that's extremely important and needs to stay focused on live-saving and the other things that we do to control the epidemic.

Now, how do these strategies or these strategic epidemic preparedness and response directions compare or relate to the programs and ideas that arise when one approaches bioterrorism preparedness from the different perspectives of the 20 other U.S. Government agencies and departments that have a piece of this action? Well, the answer is -- and I think you can go to Amy Smithson's report number 35 -- and see that maybe not very well. We don't seem to be as coordinated as we could. And I think with a little bit of a cover towards saving lives and controlling the epidemic, I think you get a little bit of coordination on the response side, and you get better draw from the intelligence and the leverage capacities of the Department of Defense and the other components that play a role in national response. I've got to tell you, I think that's extremely important.

The second issue I want to bring -- tie up today and begin to talk -- and I mention in view of a humanitarian assistance role -- is it is clear that the national pharmaceutical stockpile that is being created by CDC will never be able to cover all contingencies for all people at all locations at the same time. No surprise to anybody. Realistic strategies for the use of this commodity as a health resource will require that managers consider how best to control the epidemic and manage victims. In the absence of consideration for the humanitarian goals of do no harm, help the greatest numbers, how can we build a consensus to properly implement this resource? The guidelines that will be most useful in determining the answers to these questions should be based on science of disease control, but must also satisfy our humanitarian expectations of compassionate and rapid care to alleviate the suffering in our fellow citizens. Without some method to assure our citizens that these items will be doled out with at least some consideration to the humanitarian needs, how do we seek to alleviate mass suffering and get consensus during a time of crisis? I think those are extremely important and certainly need to be considered as we develop the component of the stockpile.
Let me move to the other issue of assisting other nations. And I think there are some compelling reasons why we need to be involved in international activities, working overseas, and develop some international capacity -- is that within the health sector of the U.S. bioterrorism preparedness program the initiative is primarily a domestic one in origin. There is no clear mandate in the monies that we receive for us to develop our international response capacities, to enlist global partners, and to share a substantial response burden with other nations to respond to epidemics in civilian populations affected by bioterrorism. Since most of the strategic threats that might point to the United States hail from outside our borders, international collaboration on preparedness seems to be extremely important. In addition, due to the contagious nature of this, borders seem to have little relevance in controlling the spread of disease. I can think of three important reasons why we need to be engaged internationally, and begin to think about that as part of our bioterrorism preparedness activities. One, it's an extension of our normal epidemic assistance activities overseas. The U.S. Government, CDC, other components in the military, probably assist other nations about 60 or 70 times a year in major outbreaks. Currently, they're working in Rift Valley, ebola, things overseas that are happening on a weekly or monthly basis. They often work directly with ministries of health or through the WHO. I think that's an extremely important thing to continue. The second issue is that assistance to the international organizations to investigate allegations of biowarfare or bioterrorism, or unexplained deaths, are going to be extremely important, and we have some resources to do that. I think those are probably things that were going to need to help and begin working on if we're going to engage in verification, follow up, and the kinds of things that help shed light on the potential use of bioterrorism. Three, as mentioned by Guenael Rodier, support for WHO and epidemic preparedness related to bioterrorism, and all its components of information sharing, response, training, working with regions, seem extremely important.

The last area I want to get into and address certainly is some issue that deals with issues of conventions, laws, rules, and grass-roots activism. And I want to get that framed properly. I think we're still looking at a lot of these issues as treaty verification, inspection, tracking of shipments of goods, and we speak of many of the legal issues related to bioterrorism. I think that's okay, and we should look for better conventions. While these tools may be helpful, the reality is for the moment that these new threats related by bioterrorism continue to mount more rapidly than do our medical and public health response measures. So in the meantime, I think there are some things that we can do. George Poste -- not George Poste, but Ambassador Butler mentioned that there are things that people can do to change the norm in consideration about bioterrorism. I believe the medical and public health community can be very effective in promoting the attitude that biowarfare and bioterrorism is unacceptable. I think we should begin doing more to galvanize our public health associations -- ASHTO, territorial health officers, at the local level, CSTE and APHL, and the infectious disease professional organizations, such as IDSA, SHEA, and EPI. It will be far easier and effective to mobilize and benefit from these groups if we can turn the national preparedness efforts more towards the importance of controlling epidemics and augmenting medical services, and a little bit less away from the way it's been until public health got engaged about two years ago, as
only an intelligence Department of Defense or a law enforcement construct. I think you need all of those things, and all of those sectors need to be healthy at the same time for optimum preparedness.

Lastly, I see some important lessons from the recent global campaign to eliminate land mines. This movement largely had its origin outside of government and had a military that had military or private sector financial interest in continuing to manufacture these devices. Over a period of about a decade, this group was able to bring together NGOs, governments, private sector partners, and many others into an effective coalition to address the growing worldwide land mine problem. This activity was extremely effective and can be credited with limiting the proliferation of certain types of devices and bringing this attention to the world in a way that individual governments can't do as effectively sometimes.

The point I want to make is that without grass-roots humanitarian activism added to the mix as another partner, it will be difficult to maintain a focus on moving public opinion of nations or groups that are developing or holding these types of capacities away from those goals. Stockpiles may continue to exist, along with the endless debate on how to negotiate or sanction these entities or nations. I think we need to reach out and broaden our coalition of partners in this effort, and it may be time to bring the NGOs in to pick up a piece of the bioterrorism preparedness and response mantra.

In conclusion, let me just run down a few things that have happened over the last two years, and summarize what I’ve said and the importance of keeping this initiative moving. As I look back in the health sector, which is the sector that we work in at CDC, I can tell you that a lot of things have happened that weren't here and capacities have been built over the past several years. We have new laboratories. We have new capacities in our divisions. We have hired new experts in pathogens that we weren't previously working with on a routine basis, such as anthrax. And there has been a whole host of new activities -- the health network, stockpiling activities. And all in all, we have about 100 people working full-time in this area. This is an explosive, dramatic increase in our attention on this important area, and there's been a lot of things accomplished.

Also, at the state and local level in the health sector, I am pleased to go to the states, and there are at least a dozen states that have absolutely stunning programs where people have taken public health leadership. They are looking at methods to control the epidemic. They have plans to augment medical services. They have health facility preparedness activities. And there is lots of activities happening, and I'm still pleased with that. But I will say that unless there is some in the national mantra, in terms of national consideration, we consider some of the humanitarian assistance issues, I think we will get off track a little bit about saving lives, controlling the epidemic, and augmenting medical services. Again, one of the components at the table -- not the only one, but certainly one that is worth mentioning once an epidemic is moving through the population.
Well, there's a few general guidelines, and I'd like to just go down these quickly before I part, and say that it seems to me that the medical and public health community can be very effective in explaining this issue to public health -- authorities, politicians, decisionmakers, and the idea -- spreading the idea that biowarfare, bioterrorism, is indeed unacceptable. I think that this is a very complex issue, and the understanding at the state and local level outside of health is not very high. And it's a very difficult issue to explain, and there's going to be great value in having this group enlisted in taking up that role.

The second issue is that in bioterrorism preparedness and response on behalf of the civilian population, job one, once something has happened, has to be to control the epidemic through all the steps of detection, surveillance, response, etcetera, and augmenting medical services. Those are the two key things.

We need to be more effective in making that case and having the other components of the government -- the federal government -- in national response help leverage their capacity to achieve those goals. I think that's very -- extremely important for our survival.

The third thing is we need to develop national and international surge capacities to respond to epidemics, and I think that we don't quite yet have the optimum national or international surge package ready. These capacities need to be broadened to keep the focus on humanitarian goals of epidemic control and medical services at the time of a bioterrorism crisis, and to effectively harness these activities of other departments. I think Dr. Rodier from WHO gave a splendid overview of the activities related to bioterrorism preparedness and response, and we need to work more effectively with WHO's communicable disease divisions in promoting their regional training, surveillance, lab coordination, on the kinds of things we could do to help respond to an international outbreak.

And, lastly, I think major stockpile decisions concerning the development and employment of this commodity should be based on public health science for the purpose of rapidly stopping the spread of disease and treating victims. This issue should be more openly debated in a scientific manner, with a realistic appraisal of threats to our population. I think those are going to be extremely important, and keeping some of the focus of that debate on the humanitarian usefulness will be critical to save lives.

With that, I'd like to close with one or a few thoughts and say I'm going to return back to CDC with my colleagues to a place where the phone rings late a night, the weekends, and we get reports of everything from anthrax in Florida to small pox in Nepal. These are real events where we had multi-agency coordination, consultation, some degree of either laboratory or professional mobilization, where there is concern for unexplained deaths on a daily basis, where alert health officers make reports and we stand ready to provide some degree of surge capacity, to assist those in need. I will tell you that there is substance in this work, and that new territory is being chartered in the health sector. Without a proper humanitarian framework at the national level, I'm afraid our efforts
will not best target the infrastructure we need to build to address the vulnerability in our population to bioterrorism. And our national investment will be significantly diminished.

With that, I'd like to close, tell you thank you for your time, and tell you it's been a splendid year of working together, particularly with our state and local colleagues, Dr. D.A. Henderson, and Dr. Peggy Hamburg. Thank you so much.

(Applause.)

Tara O'Toole, MD, MPH

The Problem of Biological Weapons: Next Steps for the Nation

DR. HAMBURG: Our next speaker will close. This particular panelist is somewhat familiar to all of you -- Dr. Tara O'Toole, the Deputy Director of the Johns Hopkins University Center for Civilian Biodefense Studies. From that role, she has been a very important voice and a true galvanizing spirit across a number of important issue areas for bioterrorism. I think she cut her teeth in dealing with complex, highly charged, and often seemingly insoluble problems during her four-year tenure as Assistant Secretary of Energy for Environment, Safety, and Health, where she dealt with such difficult problems as studying major safety and environmental hazards at the nation's nuclear weapons complex and taking action to reduce those risks; developing the Department's first nuclear safety rules and professional enforcement office; and leading a multi-agency task force that oversaw the government's investigation into human radiation experiments conducted during the Cold War. She also has experience at the Congressional Office of Technology Assessment and is trained in medicine, board certified as an internist and an occupational medicine physician, and brings all of these many experiences and perspectives to her work. She is going to talk to us about her vision for next steps for the nation as regards to the threat of biological weapons.

(Applause.)

DR. O'TOOLE: You've been a very attentive audience. I want to acknowledge at this point the people who carried the burden of the logistics implementation of this meeting, a task that at times was comparable in complexity to managing a bioterrorism attack. Sandy Harwood -- would you folks stand up, please? Sandy Harwood of the Infectious Disease Society of America, and Andrea Lapp of Johns Hopkins, were the extraordinary event managers for this. You can stay standing. Tim Holmes, Molly -- where is Molly? Molly D'Esopo, as well as Monica Schoch-Spana, and a very able group of Johns Hopkins students have helped us out tremendously. Please give these people a hand. They're why you are here.
(Applause.)

Great job. For the next few minutes, I’m going to try and weave ideas together from previous speakers, along with some thoughts of my own and those of my colleagues at the Hopkins Center into some proposals for where the nation needs to go -- the top of the list that we think we have to accomplish in the next two years in order to deal with the problems of bioweapons and bioterrorism. But, first, I want to stand back for a moment and consider the larger context of the bioweapons problem, once again.

Where do we stand at this point, at this moment in history? You know, this question is, of course, much on the minds of Americans of voting age these days. The future is not yet written. The votes may or may not be counted. They may or may not count. But at least to some degree the future is ours to compose. Some of the major struggles before us are clear. Among the principal challenges of our generation is the imperative need to manage the adverse consequences of the powerful technologies we have created. At the top of this list are nuclear and biological weapons.

Biological weapons are in the world. Let us be clear: the efficacy of these weapons and their ability to kill large populations has been known for decades and demonstrated persuasively by all possible means short of the use in war or an actual bioterrorism attack. And there is evidence that at least in Iraq bioweapons may have been used on a small scale there. What has been largely overlooked in the complaints about the lack of a quantitative threat analysis, and arguments about how many microbiologists a terrorist must know to build a truly scary weapon, is the trajectory of biological science in these times.

As George Poste said in his remarks, we are on the threshold of the age of big biology. The momentum and pace of this Cambrian explosion of biological knowledge are prodigious. And as our understanding of molecular biology expands, as we develop the ability to manipulate cellular processes, we will also inevitably create the tools to build more varied and more powerful biological weapons. At the same time, the widespread use and market forces will ensure that the techniques needed to exercise this knowledge will become simplified and more widely accessible. Consider, for example, the effort underway to derive infectious influenza A virus from viral complementary DNA. This has been chronicled in prestigious scientific journals for the past year or so, and the work has progressed to the point that infectious virus can be generated from only eight plasmids. A year ago, a minimum of 17 plasmids were required, and earlier methods of producing the virus from the cloned DNA were far slower and more cumbersome than is the case today.

Now, these methods are a great boon to researchers struggling to thwart another influenza pandemic. But this work has a very obvious dark side. A senior researcher concerned about the implications of this achievement and the relative ease with which an influenza might be crafted, recently wrote the Center and noted that the current joke among molecular biologists is not only can a high school student construct such a weapon, so can the janitor of the school.
Those who are still bothered by the lack of quantitative threat estimates for delivered epidemics should also consider that the risk from natural epidemics of infectious disease is increasing at this point in history. Why is this? Well, an increasing proportion of the world’s six billion people live in large cities. Before 1950, only London and New York had populations of over seven million. Now, there are over 15 mega cities which harbor more than 15 million residents apiece. Half of these are in the developing world where poor sewage, overcrowding, inadequate nutrition, lack of clean water, and living conditions which place humans and animals in close proximity create almost ideal environments for breeding harmful pathogens.

The forces of globalization offer efficient conduits for the spread of disease. International transport of people and goods by jet is routine. In the 1918 flu pandemic, it took four months for the virus to circle the globe. That was in an era of cargo ships and trolley cars. Today, a deadly virus or bacteria can traverse the planet in a day. Globalization has also created vast networks of food distribution which allow widespread dissemination of tainted products and greatly complicate efforts to prevent contamination. Further, the pressures of population growth and commercialization have fueled human intrusion into once remote ecosystems, increasing the chances of contact with previously unknown and potentially dangerous viruses and bacteria.

And, finally, the natural evolution and mutation of microbial pathogens abed by imprudent prescription practices and inadequate public health have ensured that drug resistance must now be factored into strategies to contain infectious disease.

All of these factors present a context that demands urgent attention be paid to the perils of biological weapons and epidemic infectious disease. If we awaken to where we are and where we are headed, if we take prudent steps to manage the technologies we have created and the conditions we have made for ourselves, we may forestall the most calamitous bioweapons scenarios. But this moment of relative calm and prosperity we now inhabit will not last.

Now, in the past two years, as you’ve heard today and yesterday, much has been accomplished. The Department of Health and Human Services has assumed a leadership role in preparing the nation to respond to a bioweapons attack. Programs run by CDC and the Office of Emergency Preparedness have initiated critical programs at the state level and provided essential support for the beginnings of state response infrastructures. Now, these efforts are incomplete and imperfect. This is natural, as Richard Falkenrath pointed out, in beginning big, complex programs. Of course, much remains to be done.

What I would like to do in the remaining minutes is suggest seven issues related to bioweapons preparedness and response in prevention, which I think are in need of particular focus and investment. First, government investments must be commensurate with the threat. In this country, elected leaders show their seriousness about an issue by the way they talk about it, and the amount of money we spend on it. If biological
weapons constitute a serious national security threat, then we should be investing some serious money in this problem.

Now, the customary number given for bioweapons defense expenditures in this fiscal year is 1.4 billion. And in health terms, this sounds like a significant amount of change. But seen in the calculus of defense spending, this is peanuts. The fact that, as Amy Smithson pointed out, we are devoting only 0.0046 percent of the 260 billion defense budget to assuring that the talents of bioweaponeers from the former Soviet Union are directed towards peaceful ends is telling and wrong.

Another good place for the next Congress to start demonstrating its commitment to take the BW threat seriously would be to appropriate funds for the Kennedy-First Public Health Threats and Emergencies Act, which authorizes up to 500 million in spending to improve public health infrastructure but does not yet have money attached to it. We need an appropriations bill.

Second, we need a very significant biomedical R&D program. We need a focused, fast-track effort to produce new vaccines and drugs, especially antiviral agents, to combat the most likely bioweapons threats. And we need to develop technologies that enable rapid and reliable lab diagnosis of BW pathogens. In the longer term, we should take on the big problem of infectious disease, and, in collaboration with international partners, try to develop ways to enhance immune resistance by means more elegant and multipurpose than the one bug/one drug approach. We need, in short, a Biomed Apollo Program. And Apollo, you may recall, was actually the God of healing. In the first nuclear age, to use Professor Bracken's phrase, we went to the moon. In this era, let’s find out what Planet Earth would be like without malaria or AIDS or the threat of a big bioweapons epidemic.

Now, we should create an R&D map for such a Bio Apollo Program that charts where we are and where we want to get to, and creating this map should be the responsibility of technical agencies in government with strong input from scientists from universities and big pharma and the biotech industries.

As Amy Alving’s talk on sensors demonstrated, it is very important to have a clear analysis of what we want to accomplish when we embark on a search for new technologies. And if you don’t have that clear understanding of the functional requirements of what you’re trying to build, you’ll end up funding a lot of sensors that don’t work outside desert environments.

Next, there are four items on my list needing attention, all of which pertain to building integrated systems or organizational networks or making key institutional connections. Many speakers have commented on the institutional fragmentation that besets many aspects of current epidemic response. Problems linking local, state, and federal efforts, connecting multiple hospitals into a community-wide network, disconnects between medicine and public health, the disengagement of positions from preparedness efforts, were among the many disconnects that got mentioned. These problems -- creating new
systems -- is a matter of changing or building organizations. This is important work, but it is very hard, and it is going to take time and persistence. And we need to realize that, so that we don't get discouraged.

Now, the talks offered a cornucopia of principles and practical suggestions for creating organizational change or forming such systems, and I want to quickly highlight some of these, before I get to the actual projects. Jim Bentley, John Bartlett, and Laurie Garrett all cautioned on the need to pay heed to the social values and needs of the community you're trying to interact with. Hospital staff are going to need assurances that their families are taken care of, if we want them to show up at work on extra shifts. Doctors are mostly likely to pay attention to messages from other doctors. And we need to recognize that members of the media have jobs to do that are also important. Martin Hugh Jones observed that the success of PROMED was due at least in part to the accountability and transparency that was built into the system.

Dual use, the importance of dual use, was mentioned many times. This is critically important in constrained budgets, and all budgets are constrained. We need to look for opportunities to build systems and find solutions to biowarfare response problems that also serve routine organizational purposes. Public health management of West Nile Virus and the broad societal benefits from biodefense R&D are examples of dual-use applications.

Things usually look like a muddle in the middle when you're involved in complex projects. Richard cautioned us that it's not normal for new, complicated programs to take time to become established. And D.A. Henderson is always telling us that the smallpox eradication campaign at midpoint had generated a lot of energy and excitement, but he couldn't tell yet if it was going anywhere.

So we have to have courage. We have to realize this is going to take time, and we also have to have some sympathy and evidence, and be generous towards those who are in the midst of trying to make these organizational changes happen. Keep this in mind the next time you have the urge to go up to some federal or state official and explain to them what they are doing wrong or have not yet done.

So with those organizational building principles in mind, here is what I think the essential systems-building and critical connections projects we ought to focus on are.

First, repair the medical-public health interface. As Marcie Layton pointed out, strong relations between clinicians and public health professionals are key -- key, key, key -- and essential to outbreak detection. The West Nile Virus might never have been discovered but for a concerned ID doc who called the Health Department and was fortunate enough to connect with a very competent public health professional who answered the phone and took action.

Next, we should focus on creating a robust electronic system for tracking and managing disease outbreaks once they are detected. Marcie also noted that managing the huge
volume of information that was coming across the Health Department’s desk during the West Nile outbreak was the biggest challenge they faced. We are very wary of spending scarce resources on extremely ambitious and expensive efforts to invent elaborate surveillance systems for purposes of detecting BW attacks. We need to try to do this, but we should proceed cautiously. As Jeff Koplan said, many public health professionals at the state and local level these days don’t have computers on their desks. Let’s at least get them plugged in to computer networks that are comparable to the ones their kids are using to order from Toys ‘R Us before we try to build the great electronic surveillance system in the sky capable of finding biowarfare needles in haystacks of background noise.

Next, we should build surge capacity in hospitals and health care facilities, and the goal here should be to create community-wide response networks designed to accommodate mass casualties brought about by deliberate or natural epidemics and other natural disasters. This will require, first, money to allow hospitals to do some planning. To start, we might consider competitive grants to develop practical templates for an intra-institutional response. We might also develop some grants for consortia of hospitals and HMOs and health departments to look at ways of integrating multiple facilities into community-wide or regional response networks. In the end, we’re probably going to need a suite of incentives and possibly regulatory penalties to create the surge capacity and response network that we need. Some aspects of this may be truly expensive, and we need to be very careful not to just put another unfunded mandate on top of the financial pressures that hospitals are already struggling with.

Next, containment of contagious disease. I’m not going to say much about this because I think this is still in the consciousness-raising and just scratching our heads and figuring out what-the-heck-are-we-going-to-do-and-how-are-we-going-to-do-it stage.

Lastly, in the prevention column, I mentioned that we have to find ways to support bioweaponeers in the former Soviet Union in their quest to earn a living and use their talents for constructive purposes. I have not heard or read of any plan for international control of biological weapons that compares in boldness and coherence to that put forth last night by Ambassador Butler, and would urge that we strive to get his idea of making the development of, or possession of, a biological weapon a crime against humanity considered and discussed at the highest levels of as many governments as possible. Many in this audience have direct access to these levels.

Now, even these few elements of the bioweapons program which I’m suggesting as priorities are ambitious undertakings. The whole catastrophe of biological weapons is immensely complex, clearly beyond the reach of any single organization or institution, or even an entire professional community to shape or control. Researchers from multiple disciplines, public health practitioners, clinicians, government officials, people from academia and industry, and from many countries and international organizations, will have to participate if we are to successfully manage the problem of biological weapons.
As individuals, we must each do what we can, as we judge proper. We cannot wait until we have finished some master plan before we jump in. And we must not get discouraged by the weight and the complexity of the task. So here we are. It's Wednesday afternoon. A moment in history when the world is struggling with what to do about biological weapons. Those of us in this room -- well fed, well educated, and free as we are -- are among the most privileged people on the planet. What remains at the end of the day, at the end of two rather long days, actually, is to answer the question: A year or two or 10 from now, what will we say we did about biological weapons? About the greatest threat of our era? I am hopeful that our answer will reflect honorably on our efforts, and I look forward to working with you in the future.

Thank you for your attention.
(Applause.)

John Hamre, PhD

National Leadership in Confronting Bioterrorism

DR. HAMBURG: Let me welcome Dr. John Hamre, the President and CEO of the Center for Strategic and International Studies, CSIS, where he has served since January 2000.

Prior to that, he was the 26th U.S. Deputy Secretary of Defense, and prior to that he was the Undersecretary of Defense from 1993 to 1997. He worked for 10 years on the Hill prior to joining the Department of Defense as a professional staff member of the Senate Armed Services Committee, and during that time was primarily responsible for the oversight and evaluation of procurement research and development programs, defense budget issues, and relations with the Senate Appropriations Committee.

He has also served in the Congressional Budget Office, where he became its Deputy Assistant Director for National Security and International Affairs. So you can see that he has been working on issues highly relevant to the concerns we've been discussing over the last two days from a number of important perspectives.

He I think sits now in a position where he can offer some reflections on what he has been directly involved in over so many years, and a position from which he now can help us chart important directions for the future.

So we are very, very grateful that Dr. Hamre has taken time out of his busy schedule to join us as we come toward the conclusion of this meeting. And I'd like to turn over the podium to him now.

(Applause.)
DR. HAMRE: Thank you very much, Dr. Hamburg. Thank you, Dr. O'Toole, for inviting me. I'm grateful to be here. I noticed that about half of the audience got up and left when I was introduced, but that's the half that had to listen to me before, so I guess that I shouldn't be surprised at that.

I must confess to be just a little surprised to be here, but pleasantly surprised. I was overwhelmed when Dr. O'Toole told me how many people were attending this conference, and, frankly, was very grateful to find out that so many professionals like you were prepared to go through the grim business thinking this through.

I remember when I first had to think about it, it was back in fall of '98, and Secretary Cohen was off on a trip in the Middle East. We were in one of our periodic dust-ups with Iraq, and I had to go over to the White House to attend an interagency meeting with the President.

And at the very end, he did something he never did any other time that I was there. He said -- he pointed his finger at me and said, "I need to talk to you for a minute." And, whew, you know, that was a big deal, and so he hauled me into the Oval Office, and he said, "Is this book Cobra Event true?"

And I said, "Sir, I haven't read it, to be honest. I don't know," but I said, "before the sun rises in the morning, I'll have 100 colonels that will have read it and we'll figure it out," you know?

(Laughter.)

DR. HAMRE: And, you know, I was -- I didn't get three feet out of the White House compound when the phones were ringing all over, DIA was doing -- we went to battle stations. You know, when the President says something, you do it.

And I was really surprised, you know, first of all, that -- and gratified, again, to find out, frankly, we had people at DOD who did know about this, and had been thinking about it for some time. I sure hadn't been.

And that led to a remarkable event several weeks later when the President brought together six or seven fairly -- really distinguished, you know, Americans who are experts in this area, and some of whom have become close friends since then, like Josh Lederberg, who has become quite a close friend.

And we had a little tutorial, you know, for the cabinet, and it was remarkable to be sitting there and having the President of the United States, and, you know, the cabinet officials sitting opposite these scientists. By the way, this is the way I think it worked in the past.

And I kind of had a feeling that's the way it -- you know, when -- when they came and told the President about nuclear weapons, I think -- I have a feeling that's kind of
what it was like 50 years ago. And it ought to be like that, where you get a dialogue with scientists who have a sense of public spirit. And it was quite an eye-opening experience.

And then, probably not more than two months after that, I remember the sinking feeling when I got a phone call from the National Military Command Center that said, "We have what we think is an actual anthrax incident here in this country." And it's like one of those events that you hope in your life never happens, and it's astounding when it does. And you just kind of -- you can remember virtually all of it, and you said, you know, this new world has finally hit us, you know.

It's, unfortunately, the product of the terrible security epoch that we all survived by the skin of our teeth -- the Cold War. You know, we were confronted by an opponent who just systematically went around the business of pulling together whatever it was going to take to win his next war; and, unfortunately, built an enormous, enormous inventory of bad things -- nuclear weapons, chemical weapons, biological weapons.

And we're dealing now with the residue of that Cold War. We're dealing with the wreckage and what's left over. And, unfortunately, it didn't go away. It didn't -- the stuff didn't go away. The devices did not go away. The knowledge did not go away.

And it created, also, something else that I think is a great worry to me, and that is it seemed to create in the minds of some others around this world that, you know, it's possible to get a poor man's version of a weapon that could at least politically neutralize those that own nuclear weapons, you know. And so all of a sudden, lots of small countries seem interested in biological weapons because it could deter only the big guys that can bring a nuke to the table, you know?

And as a consequence of that, over the last 10 years, we've got 14, 15, 16 countries that have created active programs to build biological weapons.

Now, I'm personally not so worried about a biological weapon in the hands of a nation state, because at its core we know how to deter a nation state. You can put things at risk that, arguably, are larger than what they can accomplish with the use of the device, you know, so I'm not as worried about that. It's a bad thing. I'm not saying you don't worry about it, but that isn't my primary concern.

What really worries me more than anything is that when nations set about the task of building these terrible things, gradually over time, the knowledge and, frankly, the technology and the material spreads out to a larger world. And it spreads out to a world of non-state actors who aren't necessarily deterrable.

It's harder to figure out, how do you deter organizations that seem to be motivated more by eschatological goals, you know, than the kind of traditional things that nations worry about, like territory, you know, or mineral rights, or something like that.
And it's this larger worry that the knowledge, the tools, the things, that have been created over the years to build these terrible things, these terrible weapons, will now spread or proliferate to those who are not necessarily deterrable. That, I think, is the great fear.

Now, ultimately, I have to tell you, the real dilemma that this poses for the Defense Department is that how we prepare for this actually gets to the core of one of America's greatest anxieties.

Americans do not want their military involved in law enforcement in the United States. They're, frankly, worried about that, you know? The military doesn't want that, by the way. And that's the last thing we want to do is to have the burden of confronting our own citizens on our own soil. That's something we don't want to have happen. And yet if we don't prepare for this terrible day, I fear that we're going to create a far greater crisis, a far greater threat to civil liberties in this country.

You know, when we had -- when the Imperial Navy bombed Pearl Harbor, it was within four months we locked up 120,000 Americans who happened to be Japanese. And if the public senses that they are under great risk and great danger, and they sense that it's out of control, I fear that the reaction is going to be to reach for extra legal solutions that we just can't have in this country.

And the last thing we want, the very last thing we want, is for the President to have no option but to declare martial law. So we've got to get ready, so we don't have that as the only option on the table.

And one of the great problems I think about bioweapons and bioterrorism is that unlike other great catastrophes -- you know, when Hurricane Hugo comes crashing ashore, or when an earthquake knocks down bridges all over California -- that by the time the President gets out there with the director of FEMA the sun is shining, and it's a nice day, and the camera crews are filming. And at least there's a sense of hope in the air. It's going to get better.

When do you get that sense it's going to get better with a biohazard, a bioterrorism attack? I don't think any of us knows what the public sentiment is going to be like at that time, the sense that tomorrow could be worse than today.

And I fear in that environment we're going to have many people that will be looking for deep solutions to their insecurity. And I've got to tell you, folks, we've got to make sure that they don't feel that the only answer is to call out the military to take control of society. That would be the worst outcome.

So, what do we have to do to get ready? You know, ultimately, this is not a problem that the Department of Defense can solve. You know, we -- I will say, first of all, we're probably the only people in the world that know how to do thoracic surgery in a
chemical environment. You know, that's a fairly specialized skill, you know?
(Laughter.)

DR. HAMRE: Thank God, you know? And it's an unbelievable capability. When you see it, see a doc, you know, in MOP gear opening up a guy's chest, that's incredible. You know? And I'm very proud of our docs that can do that.

But that's not a capability that we have just in abundance. That's a fairly specialized skill set, you know? And I don't know how in the world you would pretend you could provide that for a country, you know, that was confronting a large-scale attack. We're the only organization in the world that could set up barrier nursing for 10,000 people over a weekend. You know, that's a fairly refined skill set, you know? That's impressive that you can do that.

We're probably the only people that can get IVs in people's arms, probably 100,000 IVs in people's arms, within a day if we had to. We know how to do that. We could do that. We've got a lot of corpsmen, you know, that can help with that.

But when you get down to it, that's not the answer. This is not a DOD problem. It is our problem, of course, as citizens. But it isn't something that the Defense Department can deal with. We have to help. We have to help, but it isn't something that we can solve.

And it's something, frankly, that even the public health instruments of the United States, those that are in the direction of the government can't really solve. As capable as Dr. Hamburg is, she doesn't have the assets it would take to do that.

You know, we did a little -- a grim tabletop exercise about a loose nuke in the United States and found out that the casualties we would have in that one location from one device exceeded all of the empty beds in the United States at any one point in time. You know, how in the world -- you know, so this is going to be an unbelievable problem that has to ultimately spring from the depth of our basic public health system in America. It's not going to get fixed any other way.

And the challenge is for the United States Government to now enter into the deepest partnership, much deeper than exists today, with the health industry in America to get ready for this; and, frankly, for an industry that doesn't really see it as being that big a problem right now.

Now, I think it helps to have a few dead crows around, you know, that got West Nile Fever, or whatever it was, that wakes them up, you know, and people are thinking about it. But this is not something that average Americans worry that much about. That's why I can't tell you how gratified I am to see so many people here. I was -- like I said, I was surprised so many people were out for this.

Frankly, I bet if I asked you to raise hands, 75 percent of you would be government, but that's another matter, you know?
(Laughter.)

DR. HAMRE: It’s a start. You know? It’s a start, as we're trying to tackle this problem. And, ultimately, what we've got, we in the government, we've got to figure out, how do we buck up and strengthen public health in America? It seems to me that's got to be at its core.

I got in -- I'm sorry that I was late because I was at another conference, but I did get in to hear Dr. O'Toole. I totally agree. That's what it's got. It's got to be grounded there.

Now, what does the government do? What does the federal government do? Well, we should use the power of the ability to convene the nation. You know, there isn't any way in the world for any other institution other than the presidency to be able to bring to the table the CEOs of the biggest pharmaceutical companies, and the biggest defense companies, and the biggest IT companies, all in one room and say, "We've got a problem, folks. You know, we've got to deal with it."

And I think the President basically cut two and a half years off the normal bureaucratic process that one afternoon by bringing us together to listen to these six Nobel laureates to talk about this problem. You know?

So, first, to use the power, the convening power of the federal government. I think that's got to be a starting point.

Second, it seems to me that this is one of those things where the federal government, with its purchasing power in research and development, can leverage the development of things we need to have done.

Now, I honestly don't believe that we can make this a government-solved problem. I think we have to find ways to leverage interest in the private sector to help solve it. And there, of course, the dilemma is, you know, do we set about the task here in the near term of trying to get a vaccine for each and every bad bug that's out there that the bad guys in the world are engineering? Or do we look for some longer term genome-based solution to this problem?

I mean, we struggled with that in DOD. Never came up with a good answer, so we threw a little bit of money at both and didn't solve either, you know. That's -- but we didn't really have a good answer to that, but that seems to be one of those clear directions that I know Dr. Hamburg worked. That's one of those things that the next administration is going to have to work.

Where do we, as a government, want to put priority? And what's the best, most likely productive avenue for research?

Third, I think, you know, the public will get a pretty clear impression -- if we have this terrible day, they'll have a pretty clear impression of whether we are in control of the
situation or we don't have control. And I don't know any way to get at that other than to have frequent exercises on -- in confusing environments to try to learn how to deal with it.

I mean, I remember we did this at DOD, and, you know, the exercises were always a little contrived, you know. I agree with that. But there's nothing like having to think this thing through in a simulated environment to make you ask first principle questions. You know?

I remember when we did this loose nuke exercise, and you said, "How are we going to bury 43,000 radioactive corpses by tomorrow morning?" That's a pretty interesting question that you don't normally confront, you know, in just your average government meeting, unless you put yourself through the process of doing an exercise and confront some of the real questions, real problems that come up in government.

And I think that it means that we've got to find ways to test ourselves, test ourselves as decisionmakers, and not just Washington-based decisionmakers. One of the things that's pretty clear to me is we have no idea what they really think out there at the state and local government level, you know?

Dr. Hamburg is a rare example of someone who comes that way here. Most of us, it's just we've been federalites our whole life. You know, we've lived in the system, and we'll die in the system, and we won't know what it's like at the state and local level.

We think we know how it works. But let me tell you, it just sounds totally different when somebody from Washington comes down to the local level and says, "I'm from the federal government. I'm here to organize this thing." You know, let me tell you, that just goes down wrong.

(Laughter.)

DR. HAMRE: And it doesn't work, because generally we don't know how to do it, by the way, you know, and so finding a way to get steady, ongoing, consistent exercises that exercise the full spectrum of the federal problem -- federal, state, local level -- I think has to be imperative.

Ultimately, you know, you can't ever design a plan that's going to be appropriate when the real crisis occurs. Every plan -- Admiral Turner knows this from countless years, you know. You know, you can do all the war planning you want, and it never happens the way the war plan says. It will never be like that.

But the whole reason of doing it is so that you don't have to invent new ideas when you confront the crisis, but you've got to be flexible. And so the whole point -- I think the whole strategic direction for the federal government has to be strategic agility in planning under crisis conditions.
I mean, that's the only way you're going to deal with it, because we're never going to know in what town this is going to happen, what the local health environment and infrastructure is like. We're never going to know the time of the day, the time of the year. I mean, there are a thousand variables that are going to take your plans and throw them right out the window.

And so it's having the ability to plan dynamically under the worst of all times is what we're going to have to set as an objective, I think, in these years in front of us.

Let me conclude. I've rattled on too long, but I do want to, again, come back to say there is much, much more on the table here than just the ability to deal with a terrible catastrophic event in America. What's really on the table, I believe, is the future of American democracy if we don't get ready.

You know, if we're not prepared for this, and the public will be demanding action of the President, we cannot accept the consequences of not being ready. None of us will want to live in that world. So we have to get ready, and the military -- I say this. I said it to them directly when I was there. I say it again now.

You know, we have to get comfortable with our role as being subordinate players in this environment, because it's going to be a terrifying thing, and they are going to be worried when they see tanks rumbling down the street. That's not going to help. We've got to find ways where we're seen as being the cavalry riding in, you know, and not the threat to society at the time.

And that means we need to find ways to work with this community, the public health community. Frankly, there was very little interaction between the Defense Department and the public health community until this came up. You know, very little interaction. And I think that we've got to make up for last time.

I should say at the policy level. I have no doubt that doc to doc there has been a robust discussion, and I think that's been good. But on a policy level, there hasn't been adequate interaction. And we don't have a lot of time to make up for lost time, but we've got to get it right.

Thank you very much for the chance to be here with you.

(Applause.)

DR. HAMBURG: Dr. Hamre is prepared to take some questions if anybody has them. Judging from the response to the last panel, I have the sense that people are beginning to get tired. Dr. Osterholm?

(Laughter.)
DR. OSTERHOLM: I don't know if that's good or bad.

Thank you very much for what I think was a wonderful and very thoughtful presentation, and it's I think heartening to many of us here to hear you speak as such.

Having kind of laid out your vision and your thought, which I think is shared by many in this room here, at the same time I have to come back to the fact that, you know, coming to a conference like this and understanding that most of it is going to be a local and state response using federal assets to supplement -- in many cases almost totally augment what we can do -- it's still, as you pointed out, a local or a state issue.

You know, we came to this meeting, and we know of the billions of dollars that go into vast categories of resources for terrorism, counterterrorism, and however you want to characterize it, and even the 1.2 billion that last year supposedly went into counterterrorism.

The point is -- and we saw this on the slides here yesterday from the CDC -- 52 million and 57 million, respectively, in the last two years have gone to state and local health departments, and virtually nothing has gone to local hospitals and medical centers to deal with this issue.

Now, having said that, part of the problem is DOD. DOD has been very effective on the Hill to continuing to get allocations of money going into DOD for purposes like this. And we all recognize this is a competitive environment. Just because there is 1.2 billion, you can't say you can take it from Peter and give it to Paul automatically.

And I think one of the things that would help us is, one, is to identify assets inside of DOD which are critical, such as USAMRIID. Many of us would tell you that you can't give enough money right now to USAMRIID as an asset there, whereas there are many other areas of DOD that are not asking any of us at the local or state level what it is we need, and yet you are preparing for what we need out here.

And so I guess I would ask you maybe to respond. But, more importantly, is a plea to you that we need help from DOD, so that the next time a four-star general in a wonderful uniform with incredible graphics is at a Senate or a House committee hearing, and somebody from a local or state health department comes in that basically had to fly Sun Country and stay over Saturday night to make sure that they had enough on their ticket, because they couldn't afford a ticket to come to the hearing, that's a tough competition.

We can't afford lobbyists as such. I realize the federal government can't lobby, but the DOD has a very effective presence on the Hill. So maybe you could respond that as long as DOD continues to look for procurement of assessments in the way it does, it's always going to be an issue of Peter versus Paul. And I can tell you, if I'm Paul out there at the local level, I'm never going to make it.
DR. HAMRE: Well, yes, I've got a couple of thoughts. First of all, I fly coach now, too, so --

(Laughter.)

DR. HAMRE: -- so I know what you're saying. You know, in all honesty, DOD ain't looking for this problem. I mean, God knows we've got enough to do. You know? We sure don't need this one.

I think, frankly, that the reason that DOD tends to be given the task, not necessarily the money -- I mean, we've had to eat it. I used to be the comptroller, and I had to swallow about $50 million a year of directed activity without getting any money to pay for it here. But it is because, you know, we do get things done. We ain't the most efficient in the world, but we do get it done.

And I think that's what -- what you see in Congress more than anything is an overwhelming frustration that they want something done, and they don't sense that it gets done in the rest of the government as quickly or as effectively as it does at DOD.

Now, I think that's -- by the way, I think that's a problem. I think you ought to -- first of all, we ought to find a way to make the rest of the government more effective if that's a real issue. If it's a presentational issue, we sure ought to fix that, too. I mean, we're pretty good at briefings, as you all know. We've perfected that art form.

But I think it's because we're a command-oriented organization, and when you say to somebody, "I want to get this done. I want to have the following activities." You know, we want to have 10,000 beds prepared to set up if we have to down at Atlanta. I remember when we did that for the Olympics, just in case, and we did it.

When we had the 50th anniversary for NATO here in town, people didn't see it, but we had 300 armored vehicles hidden in the basements of buildings in town to get them out just in case there was an attack. I mean, we know how to do this stuff, and we're pretty good at it, and I think that's the reason, frankly, we tend to get -- we tend to get direction.

But I personally believe that this is something we ought to be working together on. It isn't just a DOD thing. And I think because we tend to be a bit more effective at making our case, and we have a reputation for being probably a little more efficient at getting it done, we probably do tend to get directions that frankly we don't need.

Now, let me, if I could, say one thing. I spent some time trying to say, what is the dividing line of where DOD ought to be involved and should not be involved? And in my mind, it comes down to this. We're the only part of the federal government that mobilizes. You know, we can't afford enough firemen or policemen or emergency response people to mobilize 1,000 of them on an emergency.
If we've got something come up like the Olympics, you know, we just drag every spare cop from all over the east coast and have them work overtime, you know, because we just don't buy enough policemen and firemen to mobilize for emergencies.

But we do have mobilizable capability in the Department of Defense. That's the nature of our work. So I think that when you say, "What part of this federal response to support a local problem belongs to the Department of Defense?" it ought to be under that area where if it requires mobilization to get the task done, then it's probably one to give us. If it doesn't, it probably belongs to somebody else.

So I personally tried to get DOD out of the business of doing this training program, you know, where we're going around to the 110 cities in the country, because, frankly, that was -- we were given the job. We weren't given any money, by the way. We were given the job and told to go off and do it. But I think that really belonged, you know, elsewhere in the federal government, probably FEMA, a combination of FEMA, HHS, to do that, not DOD.

And I think that ought to be criteria. Before Congress gives us an assignment, ask, is it really something that requires the mobilizations capabilities of the Department of Defense to do it? And then, if the answer is yes, okay, then give us the job. If it doesn't, then find the other part of the federal government where it's best to put it. And I'd say that at a hearing.

DR. OSTERHOLM: Thank you

Senator Edward M. Kennedy

National Leadership in Confronting Bioterrorism

DR. HAMBURG: Thank you very, very much, and we will now move into a slightly different mode. We had hoped and expected that Senator Kennedy would be with us in person. However, he was unexpectedly delayed in Boston and cannot actually be here. However, he is very disappointed that he can't be here in person and determined to find a way to join us in spirit and in voice.

So he, as I understand it, is waiting on the phone at this very moment. So rather than keeping him waiting, I will be brief in my introduction, since he really does not deserve --

(Laughter.)

-- or require, excuse me -- excuse me --
(Laughter.)

He does not require introduction.

(Laughter.)

I'm going to have to do a lot of penance for that one.

(Laughter.)

DR. HAMBURG: In any case, as you all know, Senator Kennedy has served in the United States Senate for 38 years and is now the third most senior member of the Senate. He is the ranking Democrat on the Health, Education, Labor and Pensions Committee in the Senate, and serves in many other key leadership positions. He has been a long-standing friend to public health, medicine, and science.

Through his leadership on the Kennedy‐First Public Health Emergency Act, he has accomplished something truly unprecedented, both -- he was able to get a bill passed in recent Congress, but also he has really defined a set of critical issues, including bioterrorism, as public health concerns, and has given us new authority to move forward in critical directions.

So let me ask Senator Kennedy to speak to us now. Senator Kennedy? I hope I didn't offend him.

(Laughter.)

SENATOR KENNEDY: Thank you, Peg, for that most recent introduction.

(Laughter.)

No. Seriously, I thank you very much for your kind remarks. Peg mentioned that I've been in the Senate for some 38 years. When I first ran for the Senate 38 years ago, I said that what the Senate needed was a young person with new ideas and idealism. And in this campaign that just ended a few weeks ago, I said in Massachusetts that what we needed in the United States Senate is now age and experience and wisdom and judgment.

(Laughter.)

And in any event, I'm delighted to have a chance to address the distinguished audience on this subject of such great importance to the nation. I regret very much I can't be with you in person today. I had planned to be. Plans changed at the last minute.

But I'm very grateful for at least the opportunity speak with you on this extremely important issue and one which I think we in the Congress can benefit as a result of, in
these past few days, consideration by so many of you on these excellent panels that I’ve watched and which I know have been invaluable.

I want to thank the Hopkins Center for all of the support and wise advice that they’ve been giving to all of us in Congress in our work on the important issue on bioterrorism. It has been said that biological weapons are the poor person's atomic bomb.

Like the lethal mushroom cloud of a nuclear weapon, a haze of anthrax spores released by a terrorist over one of our major cities could bring death and disease to millions of Americans, and we must defend our country against biological weapons as vigorously as we defend it against other threats to our national security.

So I commend all of the participants in the conference for your impressive leadership in seeking to improve the nation’s defenses against bioterrorism.

Almost two years ago, Senator Frist and I began a process of consulting with experts in medicine and counterterrorism and biomedical science and public health to determine what measures were needed to improve the nation’s response to the threat of bioterrorism.

And time and again we were told that the best way to defend the nation against biological weapons is to strengthen the public health agencies at the local, state, and national levels, and we are indebted to many of you that are here today for the expert advice and the recommendations you gave us during this process of consultation.

And the result of the extensive public outreach to so many of you was our Public Health Threats and Emergency Act, which Senator Frist and I introduced in the Senate just last June. Congress approved this important legislation as part of a package of public health bills, and President Clinton signed it into law earlier this month.

And I'm very hopeful that the Act will begin to give the nation’s dedicated medical and public health professionals the additional support they need for effective defenses against bioterrorism.

Biological weapon is the ultimate in stealth technology. In a bioterrorist attack, there may be no sudden explosion or flash of light to announce that a terrorist attack has taken place. Instead, a bioterrorist attack could announce itself slowly and quietly when patients begin to arrive at hospitals and clinics with symptoms as seemingly innocuous as mild fever or headaches or muscle pains.

And in the wake of a bioterrorist attack, the medical professionals will have to act quickly to recognize the signs and symptoms of exposure to a biological weapon, and hospitals and public health laboratories will need to identify the pathogens used in the attack. And public health agencies must monitor the disease outbreak and mobilize the medical resources to contain it, and the special skills of federal health agencies must be ready to supplement the state and local efforts.
And instead of the seamless web that is needed to combat the bioterrorism, Senator Frist and I found that -- with your help -- that the nation's public health network has gaping holes. And many public health agencies are underfunded, ill equipped, poorly prepared to respond to bioterrorist attacks or other modern disease threats.

And in this electronic era when we can send an e-mail message from Capetown to Cape Cod in the blink of an eye, the nation's public health agencies often lack equipment as basic as a fax machine.

So at a time when scientists have deciphered the entire DNA sequence of the human genetic code, many of the nation's public health laboratories can conduct simple genetic tests to identify the deadly microbes rapidly and accurately, yet in a disease emergency swift action can keep a local outbreak from becoming a national epidemic. A few lost hours can mean thousands more lost lives.

So the recently enacted legislation takes important steps to correct these grave deficiencies. It authorizes grants for the public health agencies to improve their capacity, to combat infectious disease outbreaks, and these grants can be used to improve communications equipment, upgrade laboratory facilities, train public health professionals in recognizing the characteristics of a disease outbreak.

And advance planning will be of the utmost importance in coping with the unique burdens that a bioterrorist attack could place on the health care system, yet hospitals and public health agencies are already stretched to the breaking point by cutbacks in their budgets and increases in their workload.

And the grants authorized by the Act will provide the resources they need to plan for disease emergencies.

Today, few doctors and nurses have the training to recognize the symptoms of the infectious microbes likely to be used in a bioterrorist attack, and few hospitals have the supplies necessary to counteract them. And the recent studies showed that 87 percent of the hospitals had an inadequate supply of the medications needed in the event of a bioterrorist attack or other infectious disease emergency.

More than 90 percent of the doctors in some hospitals have received no training in recognizing the symptoms of exposure to a biological weapon, and over 60 percent did not even know where to report such symptoms if they were detected. So under our legislation, the grants to the hospitals and clinics will help train the health professionals in recognizing the symptoms of an attack and to help hospitals upgrade their capacity to treat the patients with contagious diseases.

And since a bioterrorist attack will have national consequences, we must also make certain that national resources can be mobilized rapidly and efficiently to combat it. And current responsibility for bioterrorism preparedness is spread over a multitude of different federal agencies with different skills and responsibilities.
The Act will improve the coordination of federal efforts by bringing together the agencies with critical responsibilities for preparedness. And, in particular, the Act will ensure the voice of the medical and public health professional is heard whenever bioterrorism preparedness is discussed, so that planning for any attack will be guided by a thorough understanding of the characteristics of infectious disease outbreak.

So the centers for the disease control and prevention have a vital role in the effort. The CDC's laboratories and other facilities are in an alarming state of disrepair. The ceilings leak and walls are crumbling, and some of the world's most dangerous microbes are kept in buildings with less security than a county courthouse. We can't expect CDC to provide the first-class results if we continue to provide only third-class facilities.

So the Act authorizes the extensive modernization and security upgrade for the CDC laboratories, so that scientists can work in secure facilities with state-of-the-art equipment.

We must also use the nation's expertise in biomedical research to develop new medications and vaccines against the biological weapons. Massachusetts is a leader in this effort. The nation's stockpiles of small pox vaccines are old and may be ineffective, so a company in Cambridge is developing a new and safer vaccine.

And another Massachusetts company is designing new forms of protective clothing for those who work in areas contaminated by contagious microbes. Projects such as these will be supported by the research initiatives that are part of the new Act, and this research will give health care professionals the tools they need to fight the disease threats of today and of the future.

So the legislation will also I believe pay dividends apart from defending against bioterrorism by improving the nation's response to infectious disease outbreaks of all types. Few experts doubt that the nation will eventually face an outbreak of a deadly infectious disease.

AIDS and malaria and tuberculosis killed millions of people around the world, and these diseases spread further day by day. And other deadly diseases, such as the ebola virus, and the Rift Valley Fever, are only an airplane ride away from our shores. And so diseases need not carry exotic names to endanger the nation's health. And the simple food-borne infections are rapidly becoming resistant to the drugs doctors have used to treat them for decades.

Medical professionals in the United States have already seen patients infected with the so-called superbugs that resist every drug in the doctor's arsenal. And the new Act will increase the support for the federal, state, and local initiatives to contain the spread of microbe resistance to antibiotics.

The Clinton administration is an important partner in this effort, and the FDA's recent decision to withdraw approval for certain antibiotics in agriculture will do a great deal to
reduce the excessive use of these indispensable drugs in food production. And I commend the administration for this timely action to protect the public health.

So even as we celebrate the passage of the Act, we realize that we have won only part of the battle. The challenge ahead is to make sure the programs authorized in the Act receive the full funding.

So with your support I'm sure we can meet this challenge, make certain that Congress sustains its commitment to public health, and with your continued skill and dedication we can make sure that the programs initiated by the Act result in a safer and more secure nation for us all now and for many years to come.

So thank you very much for your strong support, for all you've done so well, and for the excellent recommendations that have been made over the past days in the panels to date.

Thank you very much.

(Applause.)