

# SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

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HEARING  
OF THE  
COMMITTEE ON HEALTH, EDUCATION,  
LABOR, AND PENSIONS  
UNITED STATES SENATE  
ONE HUNDRED EIGHTH CONGRESS  
FIRST SESSION  
ON  
EXAMINING THE STATUS OF THE SEVERE ACUTE RESPIRATORY  
SYNDROME THREAT

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APRIL 29, 2003

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## **SEVERE ACUTE RESPIRATORY SYNDROME (SARS)**

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**TUESDAY, APRIL 29, 2003**

U.S. SENATE,  
COMMITTEE ON HEALTH, EDUCATION, LABOR, AND PENSIONS,  
*Washington, DC.*

The committee met, pursuant to notice, in Room SD-106, Dirksen Senate Office Building, Senator Gregg (chairman of the committee) presiding.

Present: Senators Gregg, Frist, Kennedy, Dodd, Mikulski, Murray, and Reed.

### **OPENING STATEMENT OF SENATOR GREGG**

The CHAIRMAN. Why don't we get started? I will ask the press to wrap up.

This is our second major hearing on the issue of the SARS virus and its implications for the United States and our role in trying to abate it as much as possible, certainly here in the United States but also internationally.

Senator Kennedy will be joining us in a few minutes, as I understand, but we wish to get started because we have a lot of important witnesses who are actively involved in the fight, and we want to make sure that they are not taken away from it any longer than necessary.

It is important to get out as much public information as we can on this issue so that the American public and to the extent we have international viewers, they can appreciate the effort that is going into trying to identify and contain this virus and be sure that their government is doing what is necessary in order to accomplish this with the tools that we have available to us.

Unfortunately, it continues to be a rampant problem especially in China. There is, as Dr. Gerberding has said before, no vaccine and right now no antibiotics which appear to be able to be used to limit its impact, and therefore it is important that we identify quickly people who may have symptoms of SARS, especially those coming into the United States. If we identify those individuals, and people self-police themselves as they come back from regions which may have high infection rates, and if they have the sense that they have cold symptoms, they call their medical provider—call them, hopefully, and not go to them—and find out what the next step is. So it is important that American citizens understand that that is their obligation as good citizens to pursue that course of action.

Today we are going to hear from Dr. Gerberding, who is head of CDC and is doing an extraordinary job for us on this issue and many other issues. We are also going to hear from Dr. Gully, from Health Canada, which is the national health organization in Canada, and Dr. Young, who is with the province of Ontario and is involved in the fight there.

I think the issues before us are many—how far down the road are we here in the United States in being ready to handle this threat. We have been lucky so far. The super-spreader who hit Toronto may have easily landed in Boston or New York or Los Angeles or even Manchester, NH.

We have just been fortunate in not having had the problems that Canada has had, and the question is now that we have been so fortunate, how can we make sure that we take advantage of our good fortune and address the problem aggressively.

Clearly, China still has a huge problem and does not appear to have its arms around that problem yet, in my opinion. But other nations such as Vietnam and Canada appear to have taken different tacks and have been reasonably successful, and we look forward to hearing from those nations, Canada specifically, today.

The border with Canada is, of course, the longest undefended border in the world, and we are very proud of that, but the issue now is do we need to defend ourselves relative to the issue of SARS coming across the border, and if so, how do we do that, and how do we do it in a constructive way that assists not only our Nation and our people but also our neighbors in Canada who are such important and good friends to us.

So we look forward to the testimony today. A number of other issues have been raised, and we will proceed to address those as we move down the road of the hearing, but first, we want to hear from Dr. Gerberding and get her thoughts and input on how we should be proceeding, specifically where we are and how we should be proceeding.

Before we begin I have a statement from Senator Dodd.

[The prepared statement of Senator Dodd follows:]

#### PREPARED STATEMENT OF SENATOR DODD

Mr. Chairman, thank you for convening this second hearing on the continued spread of Severe Acute Respiratory Syndrome (SARS). This is an important follow-up to our last hearing, which took place two weeks ago. Since that time there have been several new developments, some positive and some negative, and I would like to understand from our witnesses how we should interpret these developments. On the positive side, Vietnam has been removed from the World Health Organization's (WHO) list of countries with local transmissions of SARS. The WHO has also reported that the disease appears to have peaked in Canada, Hong Kong, and Singapore. And there still have been only a limited number of cases, and no deaths, in the United States. However, it is not all good news. The number of cases and resulting deaths rises every day in China, and it is still unclear whether all cases are being reported.

With all of our advances in the field of medicine, it is always shocking when an illness suddenly appears that we know almost

nothing about. In this country, we have been very fortunate to have conquered so many of the diseases that have threatened us in the past, that we may begin to feel almost invincible. However, the development of an illness such as SARS reminds us that we must remain vigilant to the threat of new and emerging diseases. Especially in a world that is now so interconnected, it is virtually impossible to stop disease at our borders.

It is always the unknown that is most frightening, Mr. Chairman, and unfortunately we know very little about SARS. That is why I believe that today's hearing has the potential to be quite useful as a forum to address some of the questions and conjecture surrounding SARS. As I am sure all of our witnesses here today would agree, we are best prepared to deal effectively with an emerging threat only when we know exactly what it is that we are confronting. Until we know the true nature of SARS, we will not be able to effectively form an appropriate response. It is my hope that today's hearing will signify a step toward better understanding the threat posed by SARS and how we might effectively respond to its emergence.

More than 300 people have already died as a result of SARS, and thousands more are infected worldwide. International flights have been cancelled, and businesses are recalling their employees from overseas. Photographs in the news media show ordinary Chinese citizens walking to work wearing surgical masks a disturbing image in this uncertain time. All the while, there is very little information about the danger that SARS presents to our nation. The American public and I include myself here is full of questions about how SARS might affect us. Is the danger likely to grow? How can I protect myself and my family? How do I recognize the disease? What should I do if I begin to feel sick?

These questions may be an overreaction based on a lack of information, which is exactly why this hearing is necessary. I am hopeful that today's panelists can answer many of these questions, and I thank them for taking the time to be here today on such short notice.

Mr. Chairman, I would again like to thank you for convening today's timely hearing. As legislators we have the responsibility to help the American public better understand emerging threats and the possible impact of these threats on their health and well being. We also have the responsibility to provide oversight of the development of an effective Federal response to the same threats. It is my hope that today's session will allow us to do both. I look forward to hearing from our witnesses this afternoon.

The CHAIRMAN. Dr. Gerberding?

**STATEMENT OF DR. JULIE GERBERDING, DIRECTOR, CENTERS FOR DISEASE CONTROL AND PREVENTION, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**

Dr. GERBERDING. Chairman Gregg, I appreciate so much the opportunity to be here to do this and the interest and leadership that you and your committee have shown in this very challenging epidemic that we are dealing with.

We are striving very hard at CDC to maintain transparency about the status of the epidemic and the steps that we are taking

to combat it, and this is really an important opportunity for us to update you and get your input but also to make this visible to all the people in the country who are interested and have a stake in how it is going. So I would just really thank you.

I also thank Health Canada and my colleagues who have been working side-by-side with us as we have come to develop international strategies for managing SARS and also my colleagues from Ontario who are here today to testify as well.

The concept of collaboration is a word that we use often, but I think the spirit and the actualization of this particular outbreak response is exemplary of what true international collaboration can be; it also illustrates the consequences when that kind of international collaboration fails.

What I thought I would do is give you a brief update on the status of the SARS epidemic and then discuss for you the current approach that we are taking in the United States as well as what some of our long-term strategies may be as we begin to transition from the beginning of this problem to the ongoing concerns that we need to look forward to and anticipate in the future.

If I can have the first graphic—this is an international map. You have seen this kind of information before, but it emphasizes the widespread distribution of SARS on a global basis. Today WHO is reporting 5,050 cases in 28 countries, and 321 deaths have been reported. That gives a crude mortality rate of about 6.3 percent internationally, but of course that mortality rate is very variable from one country to another, and it may in fact go up as the time lag between when cases are detected and people either recover or die from illness and the statistics catch up with the events internationally.

From a domestic perspective, today we are reporting 220 suspected cases. These are people who have traveled or who have had direct contact with SARS patients and who are ill but do not have the full-blown pneumonia. We are also reporting 52 probable cases. These are individuals who do have the pneumonia. And today, shortly following this briefing, CDC will be releasing a dispatch from our Morbidity and Mortality Weekly Report that will provide for the first time for the U.S. case definitions that include laboratory criteria of infection. So we are adding to the concept of clinical status of the patients, which would be mild illness, moderate illness for suspect case definitions and then SARS, the severe illness with pneumonia, another dimension which is laboratory-confirmed, meaning one of the three testing criteria for laboratory results has been positive or laboratory-negative, meaning those tests are negative, and then finally, laboratory-indeterminate, either because we have not done the test or the test results are pending.

This will add a degree of precision, although at the current time, the status of our test is not accurate enough, or at least we do not know the accuracy of the test at this point to indicate that if someone has a negative test, they do not have SARS. We have more to learn about the interpretation. So we are putting this out as an additional tool for classifying individuals with the suspicion of SARS, but we are continuing to cast a very broad net for our isolation precautions because we do not want to overlook any potential infectious people who could serve as a vector of transmission to others.

So we would be happy to make that dispatch available to you when it is published and disseminated later today.

We have a current strategy in the United States that emphasizes several key components. First and foremost is, again, international collaboration, and we are extremely fortunate and grateful for the efforts that WHO has made to coordinate the overall global response to SARS. Their leadership in the investigation as well as the laboratory coordination is unprecedented and I think certainly accounts for why we were able to learn so much so quickly once the WHO alerted the international community to the evolving SARS problem.

But domestically, our first priority is protecting travelers, since travelers are the individuals who seem to be at greatest risk of SARS right now on the international scale, and our protection of travelers consists of information for outbound travelers as well as information for inbound travelers.

Outbound travelers are continuing to receive information in the form of health alerts, travel alerts, which basically say be aware that there is SARS in the country that you are planning to visit, do not go to places where SARS is being transmitted, and use common sense precautions to protect yourself.

A higher level of precaution is a travel advisory, which says there is concern for travelers acquiring this infection in the country, and it is important that you not go there unless you have absolute reason to be there—in other words, nonessential travel to an area should be avoided.

Right now, mainland China, Hong Kong, Taiwan, and Singapore are countries in which we have travel advisories. We had a travel advisory in Vietnam as well, but it turns out that they have been able to successfully contain the epidemic there, there is not evidence of ongoing risk to travelers, so in the last 24 hours, we as well as WHO took Vietnam off the list of countries where non-essential travel should be avoided.

Our efforts on behalf of travelers include the mechanisms for captains on airliners and other vessels to have the requirement of reporting an ill passenger to a Customs official as the flight is inbound and then, for CDC, quarantine investigators or other Customs officials to intervene, board the plane or the boat, and evaluate whether the ill passenger is suspicious for SARS and could be posing a risk to other passengers.

Finally, of course, is the ongoing distribution of these health alerts. This is one that has been updated since my last hearing here, and I can assure you that it is now in Spanish and French as well as several other languages, and we are making these health alerts available to airplane and vessel passengers. In addition, these are being distributed at the 13 land crossings between Ontario and the United States, where we have approximately 5 million travelers cross the Ontario-U.S. border every month. So we have had enormous collaboration and cooperation with the Canadian Government, with Health Canada, and with the Ontario health officials. We have also benefited from the interaction with the Department of Homeland Security and the Customs inspectors, who have been totally supportive of this major step up in our alerting process.

So international collaboration, protecting travelers, and the third component of our current strategy is to detect cases of SARS and isolate them as quickly as possible. And the public health community and the clinician community in this country have done an absolutely outstanding job of early detection but also of implementing the kinds of airborne and other precautions in the health care setting that will protect our health care workers.

Our observation so far has been that in the countries where SARS has really evolved into the community, the weakest link in the chain is the health care system and the spread to health care personnel. So we are putting huge effort into making sure that we have the best possible protection in the health care environment from the moment the suspected patient has the initial contact with anyone in the system.

Isolation in our country for SARS cases has been almost entirely voluntary. This is a typical pattern of maintaining and managing infectious diseases in hospitals, but we also have in our State and local health officials the authority to require a patient with SARS to be isolated should that ever be necessary.

Finally, the fourth important component of our strategy is to protect the contacts of SARS patients. That includes in this country a series of efforts. No. 1 is to identify the contacts, and our health officials have done a great job of looking for potentially-exposed people; second, putting those people in an active monitoring program where they are contacted on a regular basis to make sure they are not identified as having early signs or symptoms of SARS; and then, if they do develop anything, to alert the health care delivery system before they get there so that those infection control precautions can be in place.

One other important issue here for us is the fact that I mentioned early on, that we are working extremely hard to be as transparent about what is going on and are putting a strong effort into communication. I wanted to give you some impression of how active our communication system at CDC has really been.

We have triaged almost 5,000 press calls. Our hotline has answered over 22,000 calls for information from the public and about 2,300 emails. We have sent updates about the clinical information to the 25,000 clinicians who have signed up for the CDC clinician registry, and 67 clinical professional organizations are taking our information and redistributing it to their memberships, so we are reaching hundreds of thousands of clinicians around the country.

Our website has been accessed by more than 6 million people on SARS so far, and we have done a satellite broadcast internationally in conjunction with WHO and clinicians in Asia that reached more than 40,000 clinicians around the world.

We have sent 16 health alerts. We are now conducting telebriefings with people in the Asian American community because we recognize the ongoing concern about fear and discrimination that they are having to deal with.

And last, our website increasingly has more and more information that is translated into other languages so the international community can benefit from the information.

This is not an exhaustive list, but I think it helps to illustrate that we are making every effort to get information out in all the

ways that we have at our disposal to do that, and we are always open to input or suggestions about how we can do that better.

A couple of quick points on the success of that effort—we have been working with collaborators at Harvard and getting some information about how the public is really perceiving SARS, and some preliminary information from this suggests that about 93 percent of the public know about SARS or have heard of it, and that is a good thing. It would be hard to miss it, but occasionally people do not pay attention.

Eighty-nine percent of people said that if they became ill with a flu-like illness, it would be very important to tell their clinicians about recent travel. That is so important to us to know that that message is getting through to the average person in the community.

Ninety-four percent said that if they had SARS, they would agree to be isolated, and about 92 percent said that if they were exposed to someone with SARS and were asked to have voluntary quarantine, they would agree to voluntary quarantine for a period of 10 days.

So our public is informed, they are willing to cooperate with public health measures, and I think that is a good thing, because right now, all the steps that I have described to you are primarily a public health strategy which is a tried and true old-fashioned way of dealing with an epidemic; but until we have a vaccine or we have antiviral treatment, this is the best we can do right now, and we will make every use of these tools, and if the problem evolves in this country, we are prepared to take additional steps to focus on containment.

We are looking at containment as the primary goal. People often ask what is the worst-case scenario. The worst-case scenario is ongoing spread such as we anticipate with influenza sometime in the future, and we do have a preparedness plan for pandemic flu, and we are adopting that plan so that we can be prepared for coronavirus or SARS if it did evolve in that direction.

I think the best-case scenario is that the containment efforts will uniformly be successful, and this will all go away. Increasingly, that seems highly unlikely, as you mentioned, given the situation in China and other countries where there is ongoing transmission.

Finally, the most likely scenario, at least as it look from our vantage point right now, is that we will have to work hard at containment, but I think we have proven that containment can be successful in getting a handle on the problem, and we hope that this will prove to be a seasonal virus and we can buy some time if the weather changes and transmission decreases—but of course we cannot count on that, so we need to be prepared to continue this effort until, again, we have the other tools.

I would just make reference to the Institute of Medicine's recent report within the last few weeks on "The Microbial Threats to Health," which makes the major statement that these emerging infectious disease problems are now part of our life in the global community, and that the kinds of things we are doing for SARS we can anticipate we are going to do again and again as our universe becomes smaller in time and geography, and we need to learn lessons from SARS and apply them more broadly for future preparedness.

The last point along those lines is the two CDC strategic plans for “Protecting the Nation’s Health in an Era of Globalization” and “Preventing Emerging Infectious Diseases,” which speak to many of the issues that have served us well in the current situation.

So I again just thank you so much for your support and leadership and for holding this hearing so that we can provide this perspective.

[The prepared statement of Dr. Gerberding may be found in additional material.]

The CHAIRMAN. Thank you, Dr. Gerberding.

Those numbers which you cited, the polling numbers that have been done at Harvard relative to people’s receptivity to being quarantined, to making sure they contact their provider if there is some sort of flu situation, are extraordinarily encouraging, and I think they reflect the great work that you folks are doing at CDC in this transparency effort of getting the message out, making sure people understand what we know and how we know it and what we need to do from here. So I congratulate you on that.

In that arena, however, you mentioned that you do not see us containing it, essentially, in China, and as a result it is continuing to grow as a problem. I am wondering if you can go into that a little bit more. I notice that the Philippines now has the issue, as well as Taiwan, China, and Hong Kong, obviously. What do you see as the game plan for dealing with those nations which were behind the curve and as a result generated the problem to a large degree? Do you think they can get a handle on this? Can they get their arms around it the way Vietnam and Canada have, or can they not?

Dr. GERBERDING. I do not know for sure. We are increasingly confident that the information that we are getting from China is reliable. We do not have teams in all areas of the country yet, but the doors are certainly more open now than they were in the past several months.

As part of the WHO effort, we have CDC people on the ground, and we are getting information. The best picture of the SARS epidemic in China right now would be characterized as “variable.” There are some regions like Beijing that are having an extremely difficult time containing this, and other cities where the problem does not seem to be widespread or present at all. Obviously, that could change. There is a lot of travel within China, so they would need to be able to exercise the same kind of containment procedures that we are using in other parts of the world.

I wish I had a crystal ball; I would try to project the situation there. But I think there is very little suggestion right now that it is going to go away any time soon in China. The Hong Kong scenario is suggestive that they are making strong progress in containment, but there are still occasionally new cases being reported there. But we did see a remarkable curtailment of transmission in Vietnam even though it started there with a very serious outbreak in the hospital. That situation, with fairly reliable data, seems to be coming under control, and likewise in Thailand, where there was not ongoing transmission.

It is very variable. You made reference to super-spreaders or hyper-transmitters, and that is a term that is useful in describing

clusters of patients and why someone is especially associated with a large number of exposed and infected people. We do not really know if there is such a thing. It may be that people who are ill are infectious because they have a lot of virus, and when you take a combination of someone who is infectious and a situation where there is inadequate protection of the contacts, you end up with that cascade or a cluster that sets off the chain of transmission. So we have a lot to learn about why some people are transmitting and others are not and why some people have severe illness and others do not.

The CHAIRMAN. How far away are we from being able to produce a reliable test, that is, you can deliver in a timely manner that gives you a pretty good reading as to whether or not a person just has the flu or whether he or she has have SARS? And isn't that critical to our capacity to contain it?

Dr. GERBERDING. We are certainly at CDC putting a high emphasis on that diagnostic testing. By the end of this week, we are sending the first kits out to the State labs that have the tests. We have two main categories of PCR tests which can identify virus RNA in the respiratory tract or the blood of some patients. We also have the antibody test which is performing as a much better test for discriminating SARS from other patients. Unfortunately, we cannot interpret it until 21 days after the person has become ill.

These tests are still under evaluation, but FDA is working side-by-side with us to get them into a status where we can use them for clinical care, and that is an imminent step that we will be taking very soon.

We also have, as you know, posted the RNA genome on the website, and I have documentation from numerous private sector companies and biomedical or biotech companies who are interested in working on diagnostic vaccines. So we are taking the steps necessary to make the information and materials available to the private sector so they can contribute to this effort, and that, in the context of an international community that is doing the same thing, putting our collaborators in Canada. I think we are very close to a reliable diagnostic test—weeks, not months or years—unlike the vaccine or the treatment which is a long way away.

The CHAIRMAN. If you could just confirm again that we believe this was not manmade and that it came from animals to humans, that would be good; and second, to what extent are we seeing the disease mutated or do we expect to see it mutate so that even those diagnostics might become less than effective?

Dr. GERBERDING. The virus itself is a single piece of RNA. It is a single-stranded virus. It is actually probably the largest RNA virus that we deal with in humans. And it is in a family, the coronavirus family, that is notorious for recombination, meaning exchange of pieces of the virus with cousins, as well as making mistakes as it replicates.

We are so early in this epidemic that we have not documented any association between changes in the virus and the pattern of transmission or the severity of illness, but it would not be surprising for this to occur with this particular kind of virus, and that is something that we have to be monitoring because it could very well

at least interfere with the PCR test and potentially with the antibody test as well.

So it is a concern. It will also have implications for vaccine treatment. But we have not identified that as a problem yet.

The CHAIRMAN. And we still do not feel that it was manmade; we feel that it was transferred from an animal to humans?

Dr. GERBERDING. The pattern and onset as we understand it in China is really most consistent with a naturally-evolving coronavirus. I do not have any evidence to suggest anything intentional at all.

The CHAIRMAN. And finally, the two prominent leaders on this issue in Canada have joined us today, and I would be interested in CDC's evaluation of where Canada stands and what we can learn from Canada.

Dr. GERBERDING. I look forward to being updated from our nearest neighbors, but from our interaction—and we do have a CDC employee at Health Canada, and Health Canada has a staff member in our operations center at CDC, and we also have a team in Ontario working in the health care system, so I think our information is reliable—we understand that we need to be cautiously optimistic about Canada. They have not had a new case in I think 7 days, and there is not evidence of ongoing community transmission there. That is why they are not on our list of travel advisories. But we are doing the alerting at the borders and for outbound passengers and if we are continuing in this in trajectory, I think we will work very hard with our collaborators in Canada to make sure the rest of the international community appreciates that the disease is contained there, at least right now.

The CHAIRMAN. So the Red Sox can go there and beat up on the Blue Jays.

Dr. GERBERDING. I am not going to get into sports issues.

The CHAIRMAN. Senator Kennedy?

Senator KENNEDY. Thank you very much, Mr. Chairman, and I thank you for holding this hearing again. It is enormously important.

And I want to thank Dr. Gerberding and all those at the CDC. I think it is important that Americans understand what a center of excellence the Centers for Disease Control is and how well it is being led. We are enormously appreciate of your leadership, Dr. Gerberding.

It has been 3 weeks since you last testified. The disease has spread to 27 countries, affected every continent, claimed 200 more lives, and sickened 2,000 more patients.

Although SARS remains a global threat, it has provoked an extraordinary global response. Health agencies around the world have responded forcefully to SARS. Scientists have labored day and night with extraordinary results. They have deciphered the complete DNA sequence of the virus. They are developing sensitive new tests to spot infection and are testing ways to cure the disease and develop the diagnostic test that Senator Gregg referred to. Public health agencies have responded effectively to prevent local outbreaks from becoming national epidemics.

As has been pointed out, SARS is on the decline in Canada, Singapore, and Hong Kong. In Vietnam, the wildfire of SARS has

been extinguished. Just one hour ago, the World Health Organization announced that it is lifting its advisory against travel to Toronto. The world owes an enormous debt to the dedicated health professionals who have worked tirelessly to protect our health from the threat of SARS.

From Boston to Los Angeles and Seattle to Miami, the story is the same. Budgets have been cut to the bone, and there is no excess capacity to meet new challenges like SARS. According to Dr. Kevin Stevens, the director of the New Orleans Public Health Department, "We have very few resources, and if we should have a SARS outbreak, we are very poorly prepared."

Dr. Laurene Mascola of Los Angeles County Department of Health Services said that, "In California, about 2,000 people die every month from unexplained pneumonia. We have dealt with SARS to the detriment of other diseases."

One of the most effective ways to fight the spread of SARS is quarantine, yet many of the Nation's major health departments would be hard-pressed to use even this basic tool of disease containment. In Philadelphia, for example, there is no city-owned hospital, and the health department has no funds to set up a quarantine facility of its own. It would instead have to rely on hard-pressed independent hospitals to house SARS patients who need to be isolated.

Seattle has only limited facilities to isolate contagious patients. That city is already facing the highest number of TB cases it has seen in 30 years. With only two full-time infectious disease physicians to serve over a million inhabitants, the city would soon be overwhelmed by a major epidemic.

In Boston, the health department is already stretched thin, answering over 200 calls a day from people worried about SARS—and there are no confirmed cases in the city.

In cities across America, there are gaps in our ability to contain a SARS outbreak should one occur, and we need to address the deficiencies, and we must address them now. Congress has tried to reduce these deficiencies in recent years, investing more in our defenses against bioterrorism, and these investments are clearly paying dividends now in the fight against SARS. But their effectiveness has been undermined by cuts in funding for hospitals and health agencies at both the Federal and the State levels.

A survey by the American Public Health Laboratory Association found that 30 State health laboratories faced budget cuts this year—only seven expected their budgets to remain the same, and none expected more funds.

Our State laboratory in Massachusetts estimates that it will need hundreds of thousands more dollars to test tissue samples for SARS. With additional funds, they could determine whether patients truly have SARS or a sniffle in a fraction of the time it takes now; the quicker the decision, the more likely we are to keep an outbreak from spreading.

This is the situation across the country. I have had my staff call the major cities in the country and the ports of entry, and I have just given you a taste of what is happening out there.

We have had extraordinary success under your leadership of CDC. We know the devastating impact that something like this can have, let alone if it were a bioterrorism threat.

What do we say to the people in the local communities about what kind of help and assistance they are going to receive in terms of trying to deal with this kind of challenge locally? What kind of hope can we give them?

Dr. GERBERDING. First of all, let me just say that I am aware of the difficulties that State and local health agencies are having in this arena and others. As I try to say publicly as often as possible, our public health system is suffering from decades of neglect, and we cannot fix it with the one-shot bolus of resources or even a sustained investment at the level that we are making in terrorism without really thoughtfully planning and focusing and prioritizing the capabilities to respond to these new threats.

We are very grateful for your leadership and Chairman Gregg's leadership, Senator Frist's leadership, and that of the full committee, for your support of the improvements in public health and public health infrastructure, and we have made progress. I really would like to emphasize that we are responding as well, I think, to SARS as we are because those investments are paying off. But there is a lot more work to do, and the appropriation that Congress made, the \$16 million that was included in the supplemental budget, we obviously need to make sure that some of that resource goes to the States to help out with the additional burden that this is placing, and we are taking a lot of steps now to make sure that we can understand and document the true needs as well as the true economic impact of what they are trying to do.

It is a moving target right now, and it is difficult to predict what they will need, but we need to take it seriously.

Senator KENNEDY. I appreciate that, and it is not entirely fair to ask you about the resources that ought to be necessary, but having gone through the SARS period and having seen what good preventive work means in terms of getting a handle on this, we know that there is still a lot of danger out there. But the progress that has been made is enormously important, and people should understand that. But we also want to try to make sure that we are going to benefit from this kind of experience if we are going to be facing other kinds of threats, whether it is dealing with smallpox, which is the administration's program—we have been able to work out the program now; that is costly in terms of implementation—plus the potential danger from bioterrorism.

So this is an enormously important area of need, and at the same time, we are facing the further cuts in terms of hospitals—about \$1.4 billion—at a time when we are returning about \$450 million that could help and assist them. We are trying to prepare them for a surge capacity at a time when the roofs are leaking.

I think we have got to try to make the investments that are necessary in terms of protecting our people at the local and community level. We see what a difference it makes when it is done that way and when we have had strong leadership.

We thank you very much for all that you have done and all that you continue to do.

My time is up, Mr. Chairman.

[The prepared statement of Senator Kennedy follows:]

PREPARED STATEMENT OF SENATOR KENNEDY

I welcome this followup hearing on SARS. And I commend Dr. Gerberding and the men and women of the Centers for Disease Control for their impressive efforts in addressing this deadly virus. We are all enormously grateful for your leadership and for the difference you have made in America, and across the globe.

In the three weeks since Dr. Gerberding last testified, the disease has spread to 27 countries, affected every continent, claimed two hundred more lives, and sickened 2,000 more patients.

Although SARS remains a global threat, it has provoked an impressive global response. Health agencies around the world have responded forcefully to SARS. Scientists have labored day—and night—with extraordinary results. They have deciphered the complete DNA sequence of the virus thought to cause SARS. They are developing sensitive new tests to spot infection and are testing ways to cure the disease.

Public health agencies have responded effectively to prevent local outbreaks from becoming national epidemics. As a result, SARS is on the decline in Canada, Singapore and Hong Kong. In Vietnam, the wildfire of SARS has been extinguished. Just one hour ago, the World Health Organization announced that it is lifting its advisory against travel to Toronto. The world owes an enormous debt to the dedicated health professionals who have worked tirelessly to protect our health from the threat of SARS.

The danger is not over, however. In China, the SARS outbreak has intensified, and we must remain on guard in this country to respond swiftly and effectively to any SARS outbreak.

And this crisis exposes anew the limited capacity of our own public health network. A brief survey of our nation's major ports and air hubs conducted by my staff this week shows that if CDC had not been able to contain the SARS outbreak in America, our local public health agencies lack the resources to protect the public from SARS and continue to safeguard Americans from other deadly diseases.

The troops in this new war on disease are doctors and nurses, and the front lines are hospitals and health agencies. But unlike our military forces; those who fight battles against disease are often not given the latest and best equipment. Instead, they must do the best they can with outdated equipment and too few personnel.

From Boston to Los Angeles, and from Seattle to Miami, the story is the same. Budgets have been cut to the bone, and there is no excess capacity to meet new challenges like SARS. According to Dr. Kevin Stevens, the Director of the New Orleans Public Health Department, "We have very few resources and if we should have a SARS outbreak, we are very poorly prepared." Dr. Laurene Mascola of the Los Angeles County Department of Health Services said that "In California, about 2000 people die each month from unexplained pneumonia. We have dealt with SARS to the detriment of other diseases".

One of the most effective ways to fight the spread of SARS is quarantine—yet many of the nation's major health departments

would be hard-pressed to use even this basic tool of disease containment. In Philadelphia, for example, there is no city-owned hospital and the health department has no funds to set up a quarantine facility of its own. It would instead have to rely on hard-pressed independent hospitals to house SARS patients who need to be isolated.

Seattle has only limited facilities to isolate contagious patients—and that city is already facing the highest number of TB cases it has seen in 30 years. With only two full-time infectious disease physicians to serve over a million inhabitants, the city would soon be overwhelmed by a major epidemic. In Boston, the health department is already stretched thin answering over 200 calls a day from people worried about SARS—and there are no confirmed cases in the city.

In cities across America, there are gaps in our ability to contain a SARS outbreak should one occur. We need to address the deficiencies—and we must address them now.

Congress has tried to reduce these deficiencies in recent years by investing more in our defenses against bioterrorism. These investments are clearly paying dividends now in the fight against SARS—but their effectiveness has been undermined by cuts in funding for hospitals and health agencies at both the federal and the state level.

A survey by the American Public Health Laboratory Association found that 30 state health laboratories faced budget cuts this year—only 7 expected their budgets to remain the same, and none expected more funds.

These cutbacks come at a time when these state and local health agencies are being asked to do more and more to protect us against SARS and other diseases. Our state laboratory in Massachusetts estimates that it will need hundreds of thousands more dollars this year to test tissue samples for SARS. With additional funds; they could determine whether patients truly have SARS or a sniffle in a fraction of the time it takes now. The quicker the decision, the more likely we are to keep an outbreak from spreading.

Even before now, health agencies and hospitals were already reeling under the burden of implementing the nation's smallpox inoculation plan. There is no reserve fund for health agencies to dip into when they respond to a crisis. To meet new responsibilities in one area, they must cut back in others.

53 percent of local public health agencies say smallpox and bioterrorism planning are taking away from other public health services. It's not easy to worry—about smallpox and have to worry about SARS too.

The picture is no brighter for hospitals. Although they have received \$500 million for bioterrorism preparedness this year, these funds are dwarfed by cuts in other areas. Graduate medical education lost \$750 million. Medicaid was slashed by \$1.3 billion. Recommended increases that were not funded took \$420 million from hospitals. The result—even with additional funds from bioterrorism grants—is that hospitals lost \$1.9 billion last year. And worse is yet to come this year.

We all have to hope that the SARS epidemic does not make us pay too high a price for our failure to equip our hospitals and health agencies adequately when we send them into battle.

That's why everyday—counts now. Dr. Gerberding is a familiar and welcome presence in the committee, and we look forward to her testimony and her recommendations for action.

We also welcome Dr. Young and Dr. Gully who will discuss the response by Canada to the SARS outbreak in Toronto. The World Health Organization this week announced that the worst of the outbreak is now over in Canada, and I commend you both for your success in dealing with this deadly epidemic.

Thank you for joining us today and we welcome your testimony.

The CHAIRMAN. Thank you, Senator Kennedy.

We are going to limit the first round to 5 minutes; both Senator Kennedy and I took about 5 minutes.

Senator Reed, did you want to ask some questions?

Senator REED. Yes. Thank you, Mr. Chairman, and thank you, Dr. Gerberding, for your testimony today and your leadership at the CDC.

Basically, our strategy today is containment, and I think consistent with that is monitoring. Could you elaborate on the procedures you are taking to monitor particularly outside the United States to get an advance notice of potential developments?

Dr. GERBERDING. When I mentioned monitoring earlier, I was speaking about the monitoring of exposed people within this country, and we have asked the State and local health officers to implement systems whereby they can contact people who have been exposed to SARS patients in the last 10 days and check in with them to make sure that they are not developing the early systems and helping to triage them to health care if they are.

Internationally, monitoring is more along the lines of surveillance for cases that are occurring there, but we are totally supportive of the WHO recommendations that passengers be screened for illness at the time of departure so that there is not exposure en route. And we are also, of course, continuing the ongoing effort to alert returning passengers of the need to get medical care if they develop symptoms within 10 days after their departure from a country where this is ongoing.

Senator REED. But you do not have a more comprehensive surveillance plan, for example—these are just airline passengers that you are talking about. What about people leaving via ship or moving over land to different countries and returning?

Dr. GERBERDING. The health alerting mechanism for returning passengers applies to the airline industry, it applies to the vessels that come either directly or indirectly to the United States, and in Canada, at the Ontario border, it also applies to car passengers.

For direct flights coming into the United States, we have very close to 100 percent contact. For indirect flights—for example, if a passenger leaves China and goes to another country before returning to the United States—we are getting close to 98 percent, but we do occasionally miss flights in that domain.

Senator REED. So I presume, then, you feel that the surveillance system in place is adequate to give you fair warning as this disease continues in China, certainly?

Dr. GERBERDING. I think the alerting of incoming passengers is going very well, and it is working. We know that people are responding to this information and getting medical care.

A broader issue is our capacity to detect these problems when they start. And the first cases of SARS were in China in November. We got a WHO alert on March 12. That is 5 months down the road. That is the kind of system that we need to address in collaboration with WHO as well as the ministers of health in the global community. That is not acceptable, and this problem got started because we did not have an early detection system to tell us what it was.

Senator REED. And do you have a plan to not only design such a system, but to request whatever funding we must make available for such a system?

Dr. GERBERDING. We do have a plan for the system, and I have to talk with you about the funding and support for it. Some of the terrorism dollars from the appropriation have gone into a program to create a better sentinel detection system internationally. But I think we have a lot of work to do before we really have a seamless system that we can rely on fast enough and early enough to tell us that there is a new threat.

A related problem that I specifically struggle with at CDC is that we cannot get specimens to the United States. We were aware that there was a mysterious pneumonia brewing in China and in Asia. We got our first specimen I think on March 13, which was one from an American citizen in a hospital in Hanoi—but it took us a really long time to get all of the patients' specimens that we needed to begin to work on this virus because the airlines were afraid to fly the specimens to the U.S. We have no independent authority to go and get specimens, and that is really a factor that has slowed us down in these international response efforts time and time again. It happened here with SARS. It happened with anthrax where we had anthrax specimens in Chile, and we could not get them to the United States, even though Department of State and DOD and everybody were trying desperately to help us.

So that is another component of the early warning system that we need to resolve.

Senator REED. And that would require legislative remedy that this committee should consider?

Dr. GERBERDING. I am not sure. We have authorization as I understand it to lease aircraft at CDC; that is how we managed the stockpile plane. But there may be additional authorities that are necessary, and I will certainly be happy to get back to you with that specific information.

Senator REED. Thank you.

Let me change the subject slightly. From your comments, it seems that this might be the face of things to come, that with globalization and with these inadequacies in at least surveillance and early alert, we could see other viruses following this. And as the chairman pointed out, this virus appears to be mutating, which is the stock of all the science fiction thrillers—the mutating virus that is detected too late.

Does this give you concern, that we might see a series of different viruses or illnesses sweeping across the country?

Dr. GERBERDING. I do not want to be alarmist, but I think history is already teaching us that that is the case. We have seen the emergence of Nipa virus, we have seen Hanta virus, now we see the SARS virus; we had the avian flu virus that fortunately did not spread easily from person to person, so we were able to attenuate that particular problem. But there is no guarantee that the next flu strain to emerge is not going to be as transmissible or more transmissible than SARS.

That is really the message of the Institute of Medicine, that these kinds of emerging infectious diseases are a part of our life, and we need to scale up and respond to this proactively, because we are not going to be able to stop their emergence.

Senator REED. So deterrence is not working; we have got to go into preemptive mode?

Dr. GERBERDING. I think so.

Senator REED. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Senator Mikulski?

Senator MIKULSKI. Mr. Chairman, I note that the Majority Leader has arrived, and as a Senatorial courtesy, I would defer to him.

The CHAIRMAN. If you want to proceed, he said he would rather hear from you first.

Senator MIKULSKI. Thank you very much, Mr. Chairman, for organizing this hearing, and thank you, Dr. Gerberding and all the people at CDC who have been working so steadfast and persistently on this.

SARS is a global menace and a local threat. Germs just do not know borders. There are three possible cases in my own State of Maryland, and Marylanders want me to ask what is the Government doing to contain SARS, to find a cure for SARS, and also to prevent it from spreading. We also need to be talking about a communication strategy about what does the public need to know about SARS, and what do they need to know about how to protect themselves.

Another issue is that lessons can be learned from SARS about how we can protect ourselves from other epidemics, whether they are triggered from who knows where or whether they come from a malevolent predator. So my question also goes to the whole issue of public health infrastructure and what I call "dual use" to protect us from something like SARS but also from something like smallpox.

Let me go to that, because Senator Kennedy raised the issues, and I would like to raise them as well. Some years ago, we found that the public health infrastructure was tattered, it was worn and in some places, even nonexistent, with local health departments not even having fax machines. The Majority Leader led this committee and the Public Health Subcommittee, and we worked on a bipartisan basis to upgrade it.

Then, with bioterrorism, we put \$1 billion into the CDC budget last year for State and local departments. Could you tell me, number one, as you are struggling so valiantly with SARS, what are the lessons to be learned to protect this Nation; number two, what is the status of our public health infrastructure—do we have the bio-surveillance? Do we have the monitoring? Was \$1 billion enough,

or was it a down payment so that we could act again in this year's appropriations?

Dr. GERBERDING. Thank you for your question and also for all that you have done to get us started on rebuilding our public health infrastructure.

There are a lot of lessons that I think SARS illustrates. The first lesson is that emerging infections are a fact of life, and we need to get used to that. I think it is also teaching us that the whole public system has to be intact. We are only as good as our weakest link, and if we have one failed public health system or one failure to be able to take the steps necessary to contain a problem like this, the whole country could suffer.

The third lesson is the importance of the continuity of public health with the health care delivery system. We have got to have both capacities—a viable and vibrant and robust medical care system with informed clinicians, but also beds and surge space and training—and that has to be immediately linked with the public health community.

For me personally, one of the most important lessons is that we have to have public health research to identify what is the best way to do all of this. We make it up as we go, and we have long experience and some success stories to build on, but looking ahead at the public health needs of the future, there are a lot of unanswered questions, and we have got to know faster how we can deal with these efforts and mitigate the consequences of a problem like this.

Senator MIKULSKI. But, Doctor, are you satisfied that local public health infrastructure, public health agencies, are really fit for duty for this new area? In my own city of Baltimore, thanks to the great help that came from the State of Maryland, we have a vigorous biosurveillance program to be ready for homeland security that is now serving us well in SARS. Dr. Peter Beilenson, our local health department official, was prime time thanks to your alerts and your information, right back in the local community. Then, using our biosurveillance techniques that were city-wide and even metropolitan-wide, we could pick up those SARS cases, and Dr. Beilenson himself went to the apartment building where one of those cases was, and the information went out. Baltimore is calm because we have confidence in Dr. Beilenson and our public health network.

We are in the shadow of Johns Hopkins and the University of Maryland; we are a wink away from the NIH—not everyone is. So my question is particularly in these large metropolitan areas that could be hit so hard, that are so high-risk, do you have confidence that they are ready, or do we need to make a greater public investment through you—meaning CDC—to really develop these essentially combat-ready systems?

Dr. GERBERDING. As you describe, Senator, the public health system is tattered, and the investments that have been made so far have helped a lot, and we are certainly much better off today than we were even a year ago—but there are certainly districts and local health communities that do not have the kind of capacity that you have in Baltimore. In particular, Baltimore has an outstanding biosurveillance network that is directly linked to the health care delivery system, and that is exceptional, and I would love to see a sys-

tem like that functional across the entire United States, if not the globe. So we do have many more steps that can be taken, and I think the investments do need to be sustained over time, because it is not a one-shot fix.

Senator MIKULSKI. Thank you.

Mr. Chairman, does that mean my time is up?

The CHAIRMAN. Yes.

Senator MIKULSKI. OK. I would just like to thank you and, really, all of the public health people who have been working around the clock to do this at the Federal, State and local levels. God bless you. I think you really are saving lives.

Dr. GERBERDING. Thank you.

I would really like to thank you for making that comment and actually, all of the people who have commented on CDC and the public health community, because while I may be here providing information, there are 400 people in Atlanta and many internationally-deployed who are doing the hard work of responding to this, and that does not even count all the folks in the medical and public health communities—they are the true heroes of this.

The CHAIRMAN. The Senate Majority Leader.

Senator FRIST. Thank you, Mr. Chairman, and thanks for holding the hearing today at an important time in an evolving crisis, that 2 or 3 months ago, none of us would have fully anticipated, although we all were aware that emerging infectious diseases were on the horizon, would continue to occur, and this is, as I have said before, one of many that we are likely to see in the future. So the time that we spend with it, the dissection of the response in the United States, in Canada, in Taiwan, and in Vietnam, is something that is both important to do and to dissect it in such a way that we can learn. Thus, for the next emerging infection, we will be able to respond quickly and appropriately. I am speaking internationally as well as domestically.

Dr. Gerberding, thanks for your leadership. I do have the opportunity to tell you that on a regular basis, and I thank you for that.

I had a fascinating experience over the last 2 weeks and had talked to Dr. Gerberding and a number of other people before going to China, but about 2½ weeks ago made a very conscious decision in part as a physician and in part as someone who is familiar with infectious disease. In fact, I spent most of my adult life fighting infectious disease in my transplant patients before coming to the U.S. Senate. I made a conscious decision to go to China, and to Taiwan and South Korea as well as Japan, but especially Taiwan and China, because it was unclear at that point in time whether accurate reporting was underway from that country.

In fact, the consensus was that there was a coverup, a coverup of data from a centralized Communist Party and centralized government. And indeed what originated in Guangdong Province in January had been covered up, had been covered up aggressively, not only in the province there but almost more inexcusably, in Beijing itself. For in Beijing, you do have the potential of infrastructure and infrastructure support and surveillance, probably more so in the provinces at large.

About 12 days ago, our delegation of eight United States Senators arrived in Beijing, and President Hu Jintao and the minister

of health at that time knew that we were coming, and up until about 3 days prior to that, they had simply not been willing to release statistics.

Now we know that over 3,303 probable SARS cases—that is the latest statistic as of this morning—and 148 people who have died have been reported from the virus in China. But 12 days ago, those figures, instead of being 3,000 were, several hundred, and instead of 148 reported deaths, were in the teens.

We did have the opportunity 8 or 9 days ago to talk directly with the leadership of the Communist Party at the highest level, the minister of health, and the acting minister of health, and also President Hu Jintao.

We were very direct in our conversations with them, and said that we were well aware that the leadership had been withholding data. And their response was that was, “We have not been collecting the data,” and that “We have an inadequate public health infrastructure”—which they do—“to really collect that data.” It was very clear that they were not releasing data nationally within the country but also globally as well.

It gave me a great deal of pride to see the World Health Organization arrive—and all of us know the story—that as they arrived, SARS patients were put into automobiles, put into ambulances, and were actually taken out of hospitals so the surveillance could not take place. This happened while we were on our Asia trip.

Again I was very direct, speaking as a physician and as someone interested in infectious diseases, but also as a political figure here in the United States, that this cannot be tolerated.

Let me say that the response of both the Communist Party as well as President Hu Jintao was very positive. The Premier had said 2 days before that he recognized that this was a problem. President Hu Jintao said this is a disaster not only in China but potentially in the entire world—and that was something that they had not said before.

With that, people then asked where are we in terms of the evolution in China, and Dr. Gerberding has people on the ground there who have had the opportunity to meet at this point. I get the feeling that things are progressing well in the sense that what is being reported as probable cases and the deaths are reasonably accurate. What is clear to me, having been in touch on a daily basis with people in the health care community there, including this morning and yesterday and every day, is that we need more data. We are not really getting the data of contacts. We are not getting the dates of onset of illness. And I know that we are working hard in that regard.

Their response is simply: We do not have the public health infrastructure. We can set the central policy at the top, but by the time you get down to the provincial level itself, there is no infrastructure there—there is nobody to collect the data, there is nobody to report the data to—there is no system.

I share that only because for me, this should give this committee but especially our CDC and our Government something that we should feel very good about in that we have begun, with the assault on bioterrorism in this committee several years ago, to de-

velop, or further develop and support that infrastructure in a very positive way.

My question, after that long introduction, stems from a concern of global surveillance. With China, the public health officials were generally not supported—nobody listened to them, nobody at the provincial level. The head of the Communist Party did not listen to them, the president of the country did not listen to them—which shows the need for real leadership at the top.

But Dr. Gerberding, how well are we doing in terms of global communications? You may have already answered this earlier, before I came in. But what can we do as a committee to facilitate, since these viruses know no boundaries, they cross rivers, they cross oceans, they go in airplanes, they go into people's nasal passages—what can we do to increase that global surveillance to make sure that when the next virus hits, we will not have to tolerate such withholding of data which allows the virus to explode and to reach a point that is critical and allows it to spread around the world?

Dr. GERBERDING. Senator Frist, first of all, we really appreciate the efforts that you made in China. I think there was a strong association between your visit and the fact that the doors became open, and we are now able to get the kind of information that we have.

I would also say that your efforts follow on those of Secretary Thompson, who made numerous efforts to intervene and connect with health ministers in China. At the World Economic Forum in January, I was present when Secretary Thompson tried to ask questions about SARS. That was just 2 months into the problem, and we were reassured there was not a problem, and that it was chlamydia, and so forth. So it has been a very long path to get to where we are, and I appreciate the problem of infrastructure in China, but unfortunately, many parts of the world lack global public health infrastructure, and I think we have a lot of work ahead of us if we are going to be able to get the kind of global surveillance system that you are talking about.

However, we do have some pieces of it. WHO has a network, and various countries have established networks of communication, and I think our next step is first of all to identify what we have that is working and fill in the gaps where it is not working. Easier said than done, but just to illustrate what can be done, in China, CDC does have a satellite network for training that has been established in the various provinces that allows us to put out information into the Chinese public health and health care community. Now, that is an enormously efficient tool for disseminating information. We just have to get it connected in the opposite direction so we can have the kind of surveillance and detection capacity that we need to find something when it first starts.

We have plans, and I would be delighted to sit down with you and with the Department folks in international health at HHS to look at what the priorities really need to be right now for filling in the gaps in the global surveillance system. It is going to be a big task.

Senator FRIST. In our meetings in China 8 days ago, I very specifically offered to the Chinese leaders our support for any technical

assistance that the United States can provide in containing the virus, and I am pleased that representatives from across Asia are meeting today to endorse a series of measures to both stop the spread of disease but also to reach out and be willing to say, Yes, we can use that help as we go forward.

Thank you for your leadership.

Dr. GERBERDING. Thank you.

The CHAIRMAN. Senator Murray?

Senator MURRAY. Thank you very much, Mr. Chairman, for holding this hearing, and Dr. Gerberding, for being here. You have been really good about your time. I have had the opportunity to talk with you about this issue several times as a member of the Labor-HHS Appropriations Subcommittee, and I know you are really working hard to make sure we have all the information.

I especially want to thank our friends from Toronto, Canada for being part of this today. I think we have a lot to learn from them—and frankly, any of us could be Toronto, so it is great for them to share their information and help us learn what we need to know as well.

I just have a couple of questions, Mr. Chairman. I know you want to get on to the other witnesses.

Dr. Gerberding, I continue to be concerned. I know we provided \$16 million in emergency supplemental to address the SARS outbreak, but I am concerned whether that is sufficient funding and whether CDC has shifted resources from other infectious disease prevention efforts so we can focus on SARS, and whether diseases like TB are being underfunded because we have this focus now. If you could respond, I would appreciate it.

Dr. GERBERDING. When the SARS outbreak started, we were in the midst of orange alert in this country because of the war in Iraq and other issues then. So from the very onset, we defined the goals of the mission but also defined the strategy as being one characterized by parsimony, and that means trying to be right-sized in the personnel and the amount of engagement in SARS that we were committing particularly in the international arena, since we had the expectation that we could be called upon to deal with a second threat or something related to terrorism.

Since that was the characterization of the response from the beginning, I think we have been doing an efficient job of managing our human resources as well as our dollars, but clearly this is a large effort, and the \$16 million appropriation was really critical to our success.

We anticipate that some of the \$16 million obviously needs to go out to the State and local agencies that are directly impacted by this as well, so it is not just there to support the CDC infrastructure.

The impact on other programs at CDC has not been zero, but we have mitigated, I think, any major impact by rotating people in and out of the SARS effort, not taking somebody from another center and keeping them engaged in this over the long haul. So our management has been designed to allow a comprehensive set of experts from across the agency—because it takes everybody, not just the infectious disease people; it takes occupational health people, it certainly takes a communications team that activates our emergency

communication system—but when people get detailed to SARS, they are there on a time-limited effort, and then they go back to their regular responsibilities so that we can minimize the impact. But I certainly could not say that there is no impact at all.

Senator MURRAY. And I think we have to be really careful about that balance as we go through this.

The other question I have is really one of communication, because as Dr. Frist has said, there are no boundaries on disease. My home State of Washington has a great public health prevention system and public health strategies in place, but not all States do. How are you monitoring communication between States, because if somebody gets infected in one State, in a city right next to another one, it very quickly can progress that way—and also internationally. Vancouver, B.C. is very close to Bellingham, WA, and there are hundreds of examples like that across both borders.

Are we working internationally with other governments as we hear about those cases and communicating back and forth between States, localities, and internationally?

Dr. GERBERDING. In terms of the domestic situation, the strategy for integrating information across State boundaries has relied primarily on the weekly—or daily, sometimes—conference calls that we have with a group of State health officers, and Dr. Siedlecki is obviously a major leader in that.

Senator MURRAY. Does everybody participate in that?

Dr. GERBERDING. Most of the States participate most of the time. At any given time, not all 50 are on a particular call. But in addition, that information is posted on the Internet, and we have health alerts that go out broadly throughout the system whenever there is anything new. We also have a connectivity with the public affairs officials in each State that link back to CDC and with each other. So we are working very hard to maintain that seamless integration.

Internationally, we have a CDC staff member at Health Canada and a Health Canada staff person in our operations center at CDC, so that has been a great help to us in having free exchange of information back and forth. We are going to do this every time because it has made so many problems disappear.

We have special groups of people looking specifically at border issues, because there is the international boundary where, for example, planes often fly to Vancouver before they come to the U.S. and so forth, so those very specific cases of the need for greater integration are handled on a situation-by-situation basis. But we can always do more, and if you have ideas or if there are gaps that come to your attention, we definitely want to try to resolve that.

Senator MURRAY. Very good. I really appreciate that.

Thank you very much, Mr. Chairman.

The CHAIRMAN. Senator Dodd?

Senator DODD. Thank you, Mr. Chairman, and thank you, Dr. Gerberding once again for being here and for your testimony.

I have two quick health-related questions and then a couple of broader questions if I can. First, I just want to get a sense—I have read some reports that SARS actually appears to have less potency when it comes to children than it does in older people. And second, since we have talked, obviously a short amount of time has

elapsed, but to what extent is the work or progress on a vaccine moving along?

Could you answer those two questions, please?

Dr. GERBERDING. Yes. With respect to children, children are not immune. I think we thought early on that this might be most severe in the elderly, since the early cases and the deaths were weighted in the direction of older people. But as we see more of the international picture unfold, we are seeing severe infection in all age groups. There is a small number of infants born to pregnant women with SARS, and that has been cause for concern in Hong Kong and probably in other areas as well.

Senator DODD. Is it showing up in the infants?

Dr. GERBERDING. So far, we do not have documentation that infants have it or that they acquired it in utero, but they were delivered by Cesarean section, and they are premature, and they have respiratory difficulties, so they are being watched very carefully to make sure that this was not a problem with in utero infection.

So there is a lot to learn. I think that if we can get the kind of information that Senator Frist mentioned from China about dates of onset and ages and the clinical characteristics of the 3,000 cases there, we are going to know a lot more about the spectrum of illness and will be able to give you a better answer to your question.

In terms of the vaccine, the short answer is we are not going to have a vaccine for at least a year, but the steps are well under way. Getting the virus sequenced was a major step. NIH has inserted the coronavirus into a certified cell line, which is an important step to getting a vaccine product started. They are starting by simply killing the virus and inoculating it in animals to see whether that protects against re-exposure. The first-generation vaccine will probably be based on something along those lines.

The optimism is that our technology should allow us to do this very quickly and that there are vaccines for other coronaviruses in animals and birds.

The pessimism is that those vaccines are not always 100 percent protective in animals and birds, and we do not know yet enough about the immunology of the response to coronavirus infection to know how likely it is that we will get a strong protective response or that the protective response to one strain will cross-protect against any evolution that occurs in the virus over time.

So there is a lot of work to be done, but there has been good progress, and I think certainly fast out of the starting gate compared to many other infectious diseases.

Senator DODD. Thank you very much.

Let me ask two quick questions if I can. I wanted to follow up on Senator Murray's question. She asked about the communication that goes on with the State health directors. What are the requirements today? I have five suspected or probable cases in Connecticut—and at some point I would like to know the distinction between a "probable" and a "suspected" case—but are there requirements that those cases be reported to you immediately? Do you know of all cases that have been identified as probable or suspected at CDC?

Dr. GERBERDING. We have high confidence in the reporting from the States, particularly—

Senator DODD. Is it required? Is it required?

Dr. GERBERDING [continuing]. It is not required. CDC has no authority to require reporting to CDC.

Senator DODD. Could you have that? Would you like to have that authority?

Dr. GERBERDING. Well, we have a system that works, and that is based on each States develops its own regulations and statutes about what is reportable to the State, and because we fund—

Dr. GERBERDING [continuing]. Well, it is a little bit different because we fund the States to report diseases to us, so there is a carrot there, and we do not have to resort to the stick. But it is true that overall, there is variability in the reporting of many of the reportable conditions. This one, because it is new and because we have these outstanding relationships, I think we have a high degree of confidence that we know about all the cases.

Senator DODD. But it is troublesome in a way. I can see why people were critical, and rightly so, of the Chinese, particularly the province, not reporting for some time—whatever their motivations may have been. I would be nervous if someone at some point in some State, for whatever reason, decided they did not want to report the cases. So I would give that some thought if you would; I would be interested.

Second, after 9/11 here, obviously, we have all taken different steps and actions to protect our homeland security. Tell me what you are thinking now—what happens if we end up with a Toronto in Hartford, CT, Baltimore, Seattle? What steps have you already planned and thought about that you would take in order to deal with that kind of problem in one of our major cities—close schools—what are the steps that you have already thought about that we would take in this country now as a result of this experience?

Dr. GERBERDING. We have a set of step-wise responses that we would be able to scale up if the situation evolved to the point that Toronto or worse experienced. The first step is to initiate the appropriate level of quarantine—and I use the word “quarantine” very precisely here; quarantine applies to the exposed but unaffected people—so we would initiate voluntary quarantine if necessary to separate the exposed people from the rest of society so that if they were incubating the disease, they would have little if any chance of passing it on. And most likely the scenario would be that the health care personnel are the most vulnerable group—that has been the experience in virtually every country—so we could go from the system we have now, where exposed people are monitored actively by their State and local health officials to a system where they are actually quarantined or set aside from others until they are out of their incubation period, which is about 10 days.

Senator DODD. Is there existing authority to do that?

Dr. GERBERDING. We have a mosaic of authorities in States for taking these kinds of steps, but yes, every State has the authority to do that. How they do it is very variable, and one of the things that has been going on since 9/11 is an evaluation of what the public health laws are on a State-by-State basis.

Georgetown and Johns Hopkins have initiated the Model Public Health Law Program, and so far, all 50 States have done an inven-

tory of the adequacy of their public health laws to deal with a situation like this. Thirty-nine States have proposed statutory regulatory changes to their State legislatures to improve their public law, and so far, I think that about 22 States have actually changed statutes or regulations to make sure they are up-to-speed.

Some States do not need to make changes because their current laws are adequate, but we are working very hard to bring everybody up to the same level—and keep in mind that if the State authority fails for whatever reason, there is a residual Federal quarantine authority, particularly if it pertains to interstate commerce or borders with the international community.

Senator DODD. I have taken a lot of time, Mr. Chairman, and I apologize.

We might want to think about something along the line—now that we have all admitted, obviously, the mobility and globalization issue that you have talked about, and Senator Kennedy has and the chairman has—we might want to be thinking about pulling all this together to some degree and looking for a coordinated national approach much along the lines of the homeland security issue here in terms of how our States interface with the Federal organizations, the World Health Organization, and others. I wonder if there could not be some stepping back and looking at this thing in its totality in light of this experience here, so that we might be better-prepared structurally, heaven forbid we are confronted with a far more serious situation than the one we presently seem to be in.

So I want to suggest, Mr. Chairman, that we might want to look at that.

The CHAIRMAN. Thank you, Senator Dodd. I agree 100 percent with that assessment, and in fact I have asked our staff to start looking at that. I think CDC has its hands full right now, so that hopefully when we get this sorted out a bit, we will have a chance to take a more comprehensive view and learn from this exercise, which is what the next panel is about and leads in naturally to the next panel.

So, Dr. Gerberding, I thank you very much for your time and especially for the extraordinary effort—the superb effort, I believe—that CDC is pursuing in protecting America's health.

Thank you.

Dr. GERBERDING. Thank you very much.

The CHAIRMAN. We will ask our next panel to join us now.

We are fortunate to have the opportunity to hear from two of the folks who are on the front lines of this issue in an area which has, regrettably, been subject to a significant impact, and that is, Canada, specifically, Toronto, and the Province of Ontario.

We have with us Dr. Paul Gully, who is the senior director general for the Population and Public Health Branch of Health Canada, who is coming to us via videoconference; and also joining us is Dr. James Young, the commissioner of public security in the Ministry of Public Safety and Security for the Government of Ontario.

We very much appreciate both of these gentlemen being willing to testify. They did actually have to get some dispensation from their government to testify before a congressional committee in the United States, and we very much appreciate their willingness to do

that and the openness of the Canadian Government in allowing this testimony to go forward, Canada of course being a good friend and great neighbor.

Why don't we start with Dr. Gully, and then we will go to Dr. Young?

Senator KENNEDY. Could I, Mr. Chairman, just join in the welcome as well?

Dr. Gully, just to join my chairman, the fact that you were able to get the lifting by the World Health Organization is a real reflection of your leadership as well, so we want to recognize that and have the American people understand that we are listening to some very expertise from both of our witnesses here today, a very important message.

We are very grateful, and I join the chairman in thanking you for taking the time, and your government, for sharing your experience with us.

Thank you.

The CHAIRMAN. Thank you.

Dr. Gully?

**STATEMENTS OF DR. PAUL GULLY, SENIOR DIRECTOR GENERAL, POPULATION AND PUBLIC HEALTH BRANCH, HEALTH CANADA; AND DR. JAMES YOUNG, COMMISSIONER OF PUBLIC SECURITY, MINISTRY OF PUBLIC SAFETY AND SECURITY, GOVERNMENT OF ONTARIO, CANADA**

Dr. GULLY. Thank you very much, Mr. Chairman and Senators.

We really do appreciate the opportunity to present to you this afternoon for Canada, and I certainly would like to emphasize and concur with the assessment of the collaboration between Canada and the U.S., our branch which is equivalent to the CDC in Canada, and the efforts of Dr. Gerberding. I would also agree with her in her cautious optimism.

I would just like to make a point. As I said, our Population and Public Health Branch is similar to CDC and also has a very similar legislative grounding as does CDC.

In terms of the context and our history with SARS in China, we in Canada were aware of this through our public health intelligence network. We were aware of what was going on in November and again in February, and then what was happening in Hong Kong in February as well as in China.

We also sent out information from that to our participants across the country in February, and I'll make reference to that again in just a minute.

The first Canadian case came to our attention on March 13. The first case in Vancouver had in fact been identified on March 6. This was an individual who came back from Hong Kong and as a result of the prior warnings of what was happening, this person experienced respiratory symptoms and, after coming back from abroad, was put under respiratory isolation.

It was unfortunate that the first case in Ontario was a woman who came back from Hong Kong, had stayed in the Metropole Hotel, became ill, and died at home, and a member of her family who acquired SARS came to an emergency room in a hospital and

spent a number of hours there and transmitted SARS, then, to health care workers and other patients.

Unfortunately, because the person had not arrived back from Asia, and in fact had not had any known connection, apparently, the possibility of SARS or an atypical pneumonia problem from Asia was not identified. I think it is a question of luck in terms, therefore, of what happened there, and I think, as I have said a number of times, it can easily happen elsewhere once it gets into a community.

From that individual to that hospital and other hospitals then came the genesis of the problem in the greater Toronto area, and Dr. Young can tell you further about that.

At the present time, we have 146 probable cases in Canada. At the moment, we have just 39 hospitalized cases—all the others have left hospitals—and indeed, a number of those are getting better, and they are staying in the hospital until they are completely recovered.

We have unfortunately had 21 deaths, which is probably a reflection of the transmission to hospital patients and their family members, and those hospital patients have tended to be older, and therefore, in the vast number of those cases, those deaths have occurred in elderly people.

So the transmission, as I said, occurred to health care workers and patients in 92 of those probable cases; home contact with health care workers and patients in 43, so close contact in the home situation; and then, two specific community settings, again traceable back to the original hospital—one transmission in a workplace, a worker who worked in a very close environment with a colleague transmitted to that individual, and then a religious group, a large religious gathering of the order to 250 to as many as 500 people, transmission to a small number, I believe 4 cases.

What is interesting is that even in a large group of people, there was not a great deal of transmission. It was a group meeting that seemed to have a lot of close contact in the way that they interacted, but it only gave rise to a very small number of people, those people who we believe were in really close contact with their fellow believers.

The last health care worker case occurred in Canada around April 20, and I will come back to that a bit later in terms of the investigation. The last case occurring in a community setting was April 7, and the last imported case, April 1.

So I think that there are grounds for that cautious optimism.

I just want to say one or two points about investigation, because this issue of case definitions has been a challenge because of a case definition including contact with a known case. But we have developed another case definition of a person under investigation geolinked, i.e., linked to a general area. And that will present a challenge to us in terms of especially those people who arrive, for example, in the U.S. who have been in Toronto, have a fever, have some respiratory symptoms, to interpret, if they had no known contact with a case or a specific setting, whether they are a SARS case or not. And I again will refer to that a bit later.

But again, we are referring to probable cases in the numbers I have referred you to, those who have definite disease.

In terms of laboratory diagnosis, we have carried out thousands of tests on now thousands of people—we say thousands of people because we have in fact tested as probable suspects also those who have traveled with neither and also, then, banked specimens. And we have some interesting results. Certainly in the probable cases, we only have about 40 percent of those who were in fact positive for the coronavirus. And we have positive cases in those people who have travel history but no symptoms. It is a mystery. It is undoubtedly a challenge in terms of interpreting the epidemiology and interpreting the lab test for the coronavirus, and we certainly look forward to collaborating internationally in answering those questions.

We have sent out kits for testing to laboratories, but we are saying that that is essentially at the moment a research tool, because as Dr. Gerberding said, a positive test may be indicative of something, a negative test is not.

We have imposed these actions early on in terms of public health management, isolation, or isolation/quarantine of probable cases and their contacts. Infection control has been a huge issue, as Dr. Young will be able explain to you, in terms of the hospitals. We have modified traditional infection control procedures, and in fact we are having the benefit of three people from CDC with specific expertise who are enabling Health Canada to work with Ontario to investigate the circumstances around health care worker transmission which appears to have occurred even though those individuals have implemented the appropriate infection control guidelines. So that is being investigated right now, and again it is a challenge.

We have in terms of Health Canada responsibility for Federal workers ranging from our staff, quarantine offices, for example, but also Customs agents, and giving advice to them has been very important.

We have also given advice on clinical management and treatments, and we are watching this very closely because our Special Access Program enabling physicians to have access to unlicensed drugs—I believe that is the same in the U.S. through the APA—that Special Access Program has just issued a notice essentially saying to physicians that because there is really no evidence that ribavirin, which is the antiviral which is being used most widely, little—actually no—evidence that that is effective, and we have had numerous reports of adverse drug reactions from this drug that, although we, the Special Access Program, will not refuse a physician further access to ribavirin, they will have to make a very, very strong case in the future.

In terms of other responses, travel advisories, as you have done in the United States, and we are indeed looking at those travel advisories. Our activities at the borders are not dissimilar to those in the U.S. in terms of inbound, and again, airlines and ships have responsibility for reporting. We also have yellow cards translated very early on into French, English, and simplified Chinese, and now we are collecting contact information on aircraft from the affected areas in Asia so that we can keep those if necessary.

Outbound, because of the classification of Toronto as an affected area, we have had another colored card, a cherry-colored card, and posters at the Pearson Airport in Toronto. It is a challenge; one has

to think of how to get information to approximately 38,000 people a day, and we are continuing to refine that, and we will be enhancing that and we will be working with the airlines to ask them to ask passengers about what is in the cards.

We are also working in terms of getting information to people who travel by rail, particularly those exiting the country, and we are working closely with CDC in terms of the issue of cruise ships.

We will be enhancing outbound screening. We have a number of suggested procedures which we will be looking at, and that is especially important in terms of the lifting of the travel advisory from the World Health Organization. I believe they are telling us that to ensure that we take the greater steps to ensure that we don't export anymore cases, we do have to give an assessment of how many cases we have exported. There may have been two in our assessment, and those occurred at least 2 weeks ago now, which we believe is important.

The World Health Organization advisory has, as was mentioned, been lifted, and lifted as of tomorrow. We lobbied heavily the World Health Organization in terms of clarifying the information that they used for the travel advisory, and we are very appreciative of the close collaboration that has taken place over the last few days on a number of videoconferences and teleconferences which led to the advisory and also a visit from Health Canada staff and the Minister of Health of Ontario in Geneva.

Another issue for us now is how to maintain a sustainable response, and I am sure Dr. Young will mention this. We hope we have turned the corner in terms of the requirement for quarantine and isolation. That has been a huge task of public health authorities. The meeting which we are holding tomorrow and the next day, which I will mention at the end, will be looking at what we should perhaps do in the future in terms of isolation, in terms of quarantine, and in terms of further infection control. Infection control will be very important because, as I have described, the challenge presented once it gets into a hospital situation is a real challenge.

Early detection was mentioned earlier. Early detection by physicians is extremely important, and getting information out to them. So rapid isolation of a suspect case could be one of the hallmarks of how we continue to control this, because we do not think it is going away. We hope that certainly transmission internally in Canada will go away, but we will continue to have to deal with imported cases, I believe, even despite all the border controls that we have.

The other sustainable response we need is in communication—the transparency, the explanation of what is happening, the reassurance of the public in terms of the fact that we have methods to control, we have methods to contain and control. And we hope that that message gets out internationally, and we hope that the lifting of the WHO travel advisory will aid that.

Another issue is the socioeconomic consequences and, even before the WHO travel advisory, economic consequences for Toronto and Ontario and Canada as a whole, because a number of people outside this country do not appreciate the size of the country and the fact that Toronto is a minuscule part of the country albeit it has a sizable population.

In terms of travel, the economic downturn has been tangible in Toronto—which again, Dr. Young may refer to. It is a challenge for all levels of government in Canada in terms of trying, again, to encourage people, say that Toronto is a safe place to be, and encourage the Torontonians to be out and about. There was a reference to baseball earlier on. The Blue Jays are selling tickets for one dollar each tonight to get people out and about in Toronto.

Finally, I would like again to emphasize the importance of collaboration within Canada with our provincial territorial partners, numerous Federal government departments, and with the U.S., as has been mentioned, the liaison with CDC and Health Canada and a staff person in Atlanta. We also now have a new lay position who is embedded with the Health Canada Emergency Operations Center.

Internationally, there is close collaboration with the U.S., the United Kingdom, the Pan-American Health Organization, and the WHO.

I agree with Dr. Gerberding in terms of the support and the lead that the WHO has given us in terms of international investigation and lab coordination.

Finally, we have having an international meeting here tomorrow and the next day. We are very pleased that Dr. Gerberding will be able to spend at least some time with us, as will Dr. David Heymann from the World Health Organization. We are going to take stock, look at lessons learned, and move forward in terms of border issues, in terms of future epidemiology, infection control, public health management, and in fact the laboratory work and science leading to a diagnostic test and vaccine.

So again I really do appreciate on behalf of the Government of Canada the invitation to present to you, and I look forward to any questions that you may have.

The CHAIRMAN. Thank you very much, Dr. Gully. That was a really excellent presentation, and not only comprehensive but I think it settles out a lot of the issues in its substance and reflectiveness of the management of the issues. So we congratulate you on it and thank you for it.

Dr. Young?

Dr. YOUNG. Thank you, Mr. Chairman.

I am pleased to be here today to discuss the important issue of SARS and to tell you about the effective measures we have taken to contain and control this new disease in Ontario.

I also wish to thank U.S. Consul General Antoinette Marwits and her staff for their strong support of Toronto during our SARS outbreak.

The Centers for Disease Control is also playing a key role in our scientific efforts and also in supporting our position in regard to the WHO travel advisory against Toronto. I am pleased to say that the WHO has accepted our facts and has agreed to lift that travel advisory.

The problem for us in responding to SARS has centered on the fact that we know so little about it. What is it? What are its characteristics? How is it spreading? When are people infectious? How do we test for it? And how do we control and treat it?

In the case of Toronto and the Province of Ontario, we faced these questions very early in the known history of SARS and only knew that we were facing the challenge after the disease was already spreading in a local hospital.

Our index case, as has been mentioned, was clear. A Toronto resident contracted SARS in an elevator in the Metropole Hotel in Hong Kong. That person happened to be returning to Toronto, became ill and died. The 43-year-old son of that person went to the hospital on March 16—and I would note that date because it is only 4 days after the initial warning about SARS that was mentioned—for treatment of what ultimately turned out to be SARS. While in the emergency department and after being admitted, this person was not in respiratory isolation. This person in retrospect is believed to have been highly infectious, and our cluster of cases takes off from this point.

This person and the next two persons who were infected through contact in that emergency department all went on to infect large numbers of other patients, health care workers, and family members.

It took us time to recognize the initial hospital case and to make the contacts from that case. Once that recognition was made, we imposed strict and effective isolation measures. By this time, however, because of the highly infectious nature of our early cases, enough staff and patients were affected that one hospital had to be closed to new admissions, emergency cases, and transfers. We also started to alert the entire health care system.

On March 25, we decided that a provincial health emergency should be declared in order to mobilize the full resources of the Province of Ontario. We decided to act quickly and boldly to attempt to eradicate SARS from our community.

We started by restricting activity in all of the hospitals in the province while we put in place stringent infection control procedures in all hospitals in the province. These included everyone, including staff, being checked for illness before entering a hospital. Staff were required to gown, glove, and mask in all patient areas of hospitals, and masks were provided for all patients entering an emergency department. Isolation was required for all respiratory patients in emergency departments until their conditions were determined.

Initially, we also felt it necessary to stop all elective surgery; we stopped all visitors and volunteers from coming to hospitals, and we organized a new, very strict, system of ambulance transfers between hospitals.

On the community side, we also took strong measures. Public health vigorously tracked all contacts of SARS cases and imposed a 10-day isolation or quarantine on all contacts. This has meant the isolation or quarantine of more than 10,000 people for a 10-day period. If persons were found to be ignoring isolation orders, legal remedies were used.

The public has also been encouraged not to go to work if they show early symptoms of SARS, including headache, malaise, or muscle ache, and not to go to work before they develop fever.

Frequent hand-washing has also been encouraged, and we have had press conferences each day at 3 o'clock in order to again be as

transparent as possible with the public, educate the public and tell the public everything that we know about SARS. This is done in order to foster a calm approach to the problem, and these measures continue to this day.

Before our initial measures had time to take hold, a transfer of one of the highly infectious patients occurred to a nearby hospital. This patient again was highly infectious, and this transfer resulted in more medical staff, their families and other patients getting SARS. This hospital was also restricted in its activities.

Our measures have proven effective. Both of the two most affected hospitals have now been reopened, and they have been through more than two incubation periods, 20 days, without any further spread or new cases. All of our known SARS cases are in SARS units in our hospitals, and there are currently 37 patients in hospitals with SARS. There is a small number of SARS patients who are finishing their recovery at home.

March 16 was the critical date for Toronto and our SARS outbreak. As well as the patients and staff becoming infected, relatives of one patient who took their patriarch to the hospital that night also became infected. They subsequently visited doctors, a funeral home, and were involved in a religious community. This series of unprotected contacts took some time to trace and piece together and is referred to as the "BLD cluster," named after the religious group. There were 31 cases within this group, and we ultimately isolated and quarantined more than 500 people. There have been no new cases from this group since April 9. It is important to note that our so-called community cases all track back to the original index case. We have had no sporadic or unexplained SARS in our community.

Over the Easter weekend, we experienced a setback in our efforts. We had some incidents of SARS developing in medical staff working in SARS units. In one instance, a very difficult and long intubation in a SARS unit infected, we believe, 15 staff who were in attendance for that medical procedure. We immediately rewrote our isolation procedures for SARS units, and we invited Health Canada and the CDC to work with us to study this unfortunate event and to recommend the best ongoing infection control standards for our SARS units. We believe that these will become the standard for SARS treatment units around the world, and we certainly appreciate the fact that the CDC not only agreed to come, but is working diligently and well with our people.

Finally, I will comment on where we are today. As of April 28, as I mentioned, we have 37 active SARS patients in our hospitals—17 fewer than 1 week ago. We have 18 active SARS patients at home finishing their recovery. We have had a total of 142 probable cases of SARS but have very few cases each day now. We have had 20 SARS patients die, but all but one of these had significant other medical conditions, and most were elderly.

There has been no spread of SARS through casual community contact, and more than 20 days have passed since the last transmission among close contacts outside the health care setting. And I again emphasize there has been no spread of SARS through casual contact at any time in Toronto.

We continue to work with the CDC on infection control for our medical staff who are working in the SARS units and with Health Canada. This, along with finding and isolating new travel cases as they come into Ontario, is our current challenge.

The streets of Toronto are safe from SARS. They are as safe as the streets of London, Paris or Washington. In fact, a BBC reporter told me last Saturday that he saw more masks and more concern about SARS in London than he did in Toronto. That was as we walked through the streets of Toronto, and people were out and about on the weekend—and, as Dr. Gully mentioned, there will be a full Sky Dome tonight out at the baseball game.

But the lesson for all of us is that it only takes one case to start a new breakout, and therefore, we must be vigilant, and we must remember that. We can best, as you asked, Mr. Chair, defend the border by working together, by sharing our experiences, by sharing scientific data, and by taking common approaches.

Thank you for this opportunity to discuss our experience in Ontario.

[The prepared statement of Dr. Young may be found in additional material.]

The CHAIRMAN. Thank you, Dr. Young, and thank you also for that excellent presentation—and I think it is a presentation that can bring a fair amount of calm to the situation, and that is important, because you reflect statistical facts which show that the virus can be contained, and I guess that is my first question to both doctors.

Do you feel you have a handle on it in Canada? As you said, Dr. Young, there may be somebody else who comes in with the disease, but do you feel as of this time that you have it under control and have a handle on it?

Dr. YOUNG. Let me speak to Ontario first, and perhaps Dr. Gully can speak for the rest of Canada. We do feel that we have a handle on the situation in Ontario. We acknowledge that we are working in our SARS units with medical staff. This is an age-old problem in infectious situations around the world in any unit, and we believe and have reason to be optimistic that our new measures are taking hold, but we are prepared to do whatever is necessary and whatever is recommended by the study group now in order to make our units as safe as is humanly possible.

By going more than two cycles of this disease both in the community and within the affected hospitals, we believe that we have succeeded in getting it out of our health care system, and as far as it went into our community—which I again remind people is only by direct contact—it is out of the community, and it is out of our general health care system.

But those remain the risks if a case comes in and it is not controlled, but those are the risks for every jurisdiction everywhere.

Dr. Gully?

Dr. GULLY. I agree with Dr. Young that we do have it under control. I also echo his words in terms of the fact that from now on, we have to ensure that any new cases that arrive are dealt with with the utmost care in close contact, but the health care setting has not been the case in numerous situations in the past with in-

fectious diseases. The hospitals have been the ones which are most vulnerable.

So I think it is important that even though it will be a long time before we get a vaccine, maybe it is a question of diagnostic test. As described by Dr. Gerberding, we have traditional methods of public health—isolation in the community, isolation and quarantine, and infection control—and these have been applied—through a huge amount of work—but have been applied and have worked.

The CHAIRMAN. Do you have a different approach toward informing and trying to get the participation of people who are coming into your country from China or other areas where there is a higher degree of infection than we have? We are giving out this yellow card, which was noted by Dr. Gerberding. Is that your process? You mentioned that you have an information card, but do you do a more aggressive screening than that in light of your experience?

Dr. GULLY. We still use the yellow card, but what we did do is to put it back onto the airplanes, so that in fact on flights from Hong Kong and from China and Taiwan, people on those planes get the yellow card on the planes, and in addition, we do collect contact information on those flights, which is then collected when people disembark.

We have, in a similar way to you, officers meeting flights to take individuals who are obviously sick and also expect the airlines to cooperate in terms of informing us of sick people.

So we have in fact put it back into the system a bit more in terms of on the planes, so that people have much longer to digest the information and to perhaps ask questions even on the flight and perhaps self-identify as being sick, so they can then be dealt with when they disembark.

The CHAIRMAN. Are you handling people who are transiting through a different country that does not have the issue?

Dr. GULLY. That is a challenge. Certainly in terms of individuals transiting through the U.S. we obviously are relying on the process which we know the U.S. is undertaking.

We have taken the opinion that we have to put things in place which are—that there is a cost and a benefit to these—and we feel that because we have not had any reported cases since April 1, what we have in place is working. And there have certainly been calls for us to do a lot more, and we have to decide what is doable, where we feel we should put in the most effort, and we believe that we have done that.

In terms of outgoing, we may be making further enhancements of that in particular because of the call from the World Health Organization relating to exported cases.

The CHAIRMAN. What would you say are the three or four things—or even five, if you have them—off the top of your head that we in our country should learn from your experience? You have developed protocols, as you said, that you expect to be generally acceptable, but if you both could respond to that question, I would appreciate it.

Dr. GULLY. The protocols that we have set up with our partners obviously in the province in the local health departments have worked, and I think it was more the fact that it was into the hos-

pital situation in Toronto before we all were aware of it. So I think that what you would do in terms of public health management and infection control is what we would do. I hope now that you do not get in the same situation that we did in terms of not identifying a person who actually came into the country with obvious symptoms and obvious disease.

Dr. Young may want to talk about the quarantine/isolation experience which is directly related to Toronto.

The CHAIRMAN. Dr. Young?

Dr. YOUNG. Yes, Mr. Chair. I would advocate several things, and some of them you have heard of. Full, open and transparent communication is number one, because it keeps the calm in the community, and it keeps people doing what we ask them to do, so that certainly is very important.

The actions that need to be taken when there is a problem—we held the view at the time we declared the provincial emergency that we had very little time to act and that we had to act properly the first time. So the actions we took were firm, they were bold, and in some cases they were described as an overreaction. And I make no apology for overreacting; I think they have to be when you are faced with this kind of problem because you only get sometimes one chance to deal with it.

You then need to mobilize in fact large parts of the government, because a problem like this affects much more than just public health; it involves the whole health care system, doctors' offices, hospitals, and long-term facilities because this disease is potentially fatal entering into a nursing home or home for the aged or chronic care facility. It means other government ministries, because it has such a broad, overarching government effect on so many departments.

And then, you need to use, I believe, the things that have worked for us—isolation, close contacts, but isolation has to be again lots of people and more people isolated than you would think necessary, and there is a big education in that; strict infection control within hospitals; and then, reeducation of the medical community—they have to approach SARS from the point of view of every case that comes in with a respiratory problem is SARS until proven otherwise, and a lot more isolation until that is proven; and finally, trying to get the community to understand that if there is a firm risk in the community, people need to stay home when they are sick until the issue is sorted out, because that allows people to be isolated in relative terms so that you do not have hundreds of contacts while somebody is out and sick with a fever.

The CHAIRMAN. That is an excellent set of recommendations, and I am sure our folks will be following that closely, as the protocols you have developed. I think it is good that you are having this meeting—it is tomorrow or the next day?

Dr. YOUNG. Tomorrow and the next day both.

The CHAIRMAN. Well, we would like to give you some tourism and send a few staff folks up from this committee, if that is appropriate, to observe and learn, because you obviously have a lot to teach us on this.

Dr. YOUNG. Very much so.

The CHAIRMAN. Just to reiterate, your last case that you identified was a public event versus a nonhospital event and was on April 9?

Dr. YOUNG. April the 9th.

The CHAIRMAN. And the incubation period is 10 days?

Dr. YOUNG. That is correct.

The CHAIRMAN. So you are fairly confident that as far as public events are concerned, this is under control?

Dr. YOUNG. That is correct. We are 20 days out today so that we are confident that our community problems are hopefully permanently behind us.

The CHAIRMAN. Well, we congratulate you, and again, Dr. Gully and Dr. Young, I thank you very much for being willing to take the time to participate in this hearing. It means a lot to us here in the United States; I know it required some special dispensation in Canada to be able to do this. We very much appreciate this cooperation, and we look forward to continuing it, and if we can be of help, you tell us; you have obviously been of great help to us.

Thank you very much.

Dr. YOUNG. Thank you, Mr. Chairman.

The CHAIRMAN. This hearing is adjourned.

[Additional material follows.]

## ADDITIONAL MATERIAL

### PREPARED STATEMENT OF JULIE L. GERBERDING, M.D.

Good afternoon, Mr. Chairman and Members of the Committee. I am Dr. Julie L. Gerberding, Director, Centers for Disease Control and Prevention (CDC). Thank you for the invitation to participate today in this timely hearing on a critical public health issue: severe acute respiratory syndrome (SARS). I will update you on the status of the spread of this emerging global microbial threat and on CDC's response with the World Health Organization (WHO) and other domestic and international partners.

As we have seen recently, infectious diseases are a continuing threat to our nation's health. Although some diseases have been conquered by modern advances, such as antibiotics and vaccines, new ones are constantly emerging, such as Nipah virus, West Nile Virus, vancomycin-resistant *Staphylococcus aureus* (VRSA), and hantavirus pulmonary syndrome. SARS is the most recent reminder that we must always be prepared for the unexpected. SARS also highlights that U.S. health and global health are inextricably linked and that fulfilling CDC's domestic mission to protect the health of the U.S. population requires global awareness and collaboration with domestic and international partners to prevent the emergence and spread of infectious diseases.

#### EMERGENCE OF SARS

In February, the Chinese Ministry of Health notified WHO that 305 cases of acute respiratory syndrome of unknown etiology had occurred in Guangdong province in southern China since November 2002. In February 2003, a man who had traveled in mainland China and Hong Kong became ill with a respiratory illness and was hospitalized shortly after arriving in Hanoi, Vietnam. Health-care providers at the hospital in Hanoi subsequently developed a similar illness. During late February, an outbreak of a similar respiratory illness was reported in Hong Kong among workers at a hospital; this cluster of illnesses was linked to a patient who had traveled previously to southern China. On March 12, WHO issued a global alert about the outbreak and instituted worldwide surveillance for this syndrome, characterized by fever and respiratory symptoms.

Since late February, CDC has been supporting WHO in the investigation of a multi-country outbreak of unexplained atypical pneumonia now referred to as severe acute respiratory syndrome (SARS). On Friday, March 14, CDC activated its Emergency Operations Center (EOC) in response to reports of increasing numbers of cases of SARS in several countries. On Saturday, March 15, CDC issued an interim guidance for state and local health departments to initiate enhanced domestic surveillance for SARS; a health alert to hospitals and clinicians about SARS; and a travel advisory suggesting that persons considering nonessential travel to Hong Kong, Guangdong, or Hanoi consider postponing their travel. HHS Secretary Tommy Thompson and I conducted a telebriefing to inform the media about SARS developments.

As of April 23, 2003, a total of 4,288 probable cases of SARS have been reported to WHO from 25 countries including the United States, and 251 of these persons have died. In the United States, there have been 39 probable SARS cases reported from 18 states. Of U.S. probable cases, 27 have been hospitalized, and none have died. In addition, 206 suspect cases of SARS have been reported and are being followed by state and local health departments.

#### CDC RESPONSE TO SARS

CDC continues to work with WHO and other national and international partners to investigate this ongoing emerging global microbial threat. We appreciate the continued support of Congress, and of this Committee in particular, in our efforts to enhance our nation's capacity to detect and respond to emerging disease threats. The recent supplemental appropriation of \$16 million to address the SARS outbreak will aid our identification and response efforts. SARS presents a major challenge, but it also serves as an excellent illustration of the intense spirit of collaboration among the global scientific community to combat a global epidemic.

CDC is participating on teams assisting in the investigation in Canada, mainland China, Hong Kong, Singapore, Taiwan, Thailand, and Vietnam. In the United States, we are conducting active surveillance and implementing preventive measures, working with numerous clinical and public health partners at state and local levels. As part of the WHO-led international response thus far, CDC has deployed over 40 scientists and other public health professionals internationally and has as-

signed over 400 staff in Atlanta and around the United States to work on the SARS investigation.

CDC has organized SARS work teams to manage various aspects of the investigation, including providing domestic and international assistance and developing evolving guidance documents. These work teams have issued interim guidance regarding surveillance and reporting; diagnosis; infection control; exposure management in health-care settings, the workplace, and schools; biosafety and clean up; specimen handling, collection, and shipment; travel advisories and health alerts; and information for U.S. citizens living abroad and for international adoptions. We have updated our travel advisories and alerts for persons considering travel to affected areas of the world. We have distributed more than 600,000 health alert notice cards to airline passengers entering the United States from China, Hong Kong, Singapore, and Vietnam, alerting them that they may have been exposed to SARS, should monitor their health for 10 days, and if they develop fever or respiratory symptoms, they should contact a physician. We have begun distributing health alert notices to airline passengers entering the United States from Toronto and at selected sites along the U.S.-Canada border.

WHO is coordinating frequent, regular communication between CDC laboratory scientists and scientists from laboratories in Asia, Europe, and elsewhere to share findings, which they are posting on a secure Internet site so that they can all learn from each other's work. They are exchanging reagents and sharing specimens and tissues to conduct additional testing.

On April 14, 2003, CDC announced that our laboratorians have sequenced the genome for the coronavirus believed to be the cause of SARS. Sequence information provided by collaborators at National Microbiology Laboratory, Canada, University of California at San Francisco, Erasmus University, Rotterdam and Bernhard-Nocht Institute, Hamburg facilitated this sequencing effort. The sequence data confirm that the SARS coronavirus is a previously unrecognized coronavirus. The availability of the sequence data will have an immediate impact on efforts to develop new and rapid diagnostic tests, antiviral agents and vaccines. This sequence information will also facilitate studies to explore the pathogenesis of this new coronavirus. We are also developing and refining laboratory testing methods for this novel coronavirus, which will allow us to more precisely characterize the epidemiology and clinical spectrum of the epidemic. These discoveries reflect significant and unprecedented achievements in science, technology, and international collaboration.

In order to better understand the natural history of SARS, CDC is investigating aspects of the epidemiologic and clinical manifestations of the disease. In collaboration with our partners, we have implemented or planned investigations to describe the spectrum of the illness, to assess the natural history of the disease, to estimate the risks of infection, and to identify risk factors for transmission. These investigations are being conducted in concert with ongoing surveillance and epidemiologic efforts.

Rapid and accurate communications are crucial to ensure a prompt and coordinated response to any infectious disease outbreak. Thus, strengthening communication among clinicians, emergency rooms, infection control practitioners, hospitals, pharmaceutical companies, and public health personnel has been of paramount importance to CDC for some time. CDC has had multiple teleconferences with state health and laboratory officials to provide them the latest information on SARS spread, implementation of enhanced surveillance, and infection control guidelines and to solicit their input in the development of these measures and processes. WHO has sponsored, with CDC support, a clinical video conference broadcast globally to discuss the latest findings of the outbreak and prevention of transmission in healthcare settings. The faculty was comprised of representatives from WHO, CDC, and several affected countries who reported their experiences with SARS. The video cast is now available on-line for download. Secretary Thompson and I, as well as other senior scientists and leading experts at CDC, have held numerous media briefings to provide updated information on SARS cases, laboratory and surveillance findings, and prevention measures. CDC is keeping its website current, with multiple postings daily providing clinical guidelines, prevention recommendations, and information for the public.

#### PREVENTION MEASURES

Currently, CDC is recommending that persons postpone non-essential travel to mainland China, Hong Kong, Singapore, and Hanoi, Vietnam. We are recommending that U.S. travelers to Toronto observe precautions to safeguard their health, including avoiding settings where SARS is most likely to be transmitted, such as Toronto health care facilities caring for SARS patients. Persons planning travel to To-

ronto should be aware of the current SARS outbreak, stay informed daily about SARS, and follow recommended travel advisories and infection control guidance, which are available on CDC's website at [www.cdc.gov/ncid/sars](http://www.cdc.gov/ncid/sars).

Persons who have traveled to affected areas and experience fever or respiratory symptoms suggestive of SARS should use recommended infection control precautions and contact a physician. They should inform their healthcare provider about their symptoms in advance so any necessary arrangements can be made to prevent potential transmission to others. Health care facilities and other institutional settings should implement infection control guidelines that are available on CDC's website.

We know that individuals with SARS can be very infectious during the symptomatic phase of the illness. However, we do not know how long the period of contagion lasts once they recover from the illness, and we do not know whether or not they can spread the virus before they experience symptoms. The information to date suggests that the period of contagion may begin with the onset of the very earliest symptoms of a viral infection, so our guidance is based on this assumption. SARS patients who are either being cared for in the home or who have been released from the hospital or other health care settings and are residing at home should limit their activities to the home. They should not go to work, school, or other public places until ten days after their fever has resolved and respiratory symptoms are absent or improving.

If a SARS patient is coughing or sneezing, he should use common-sense precautions such as covering his mouth with a tissue, and, if possible and medically appropriate, wearing a surgical mask to reduce the possibility of droplet transmission to others in the household. It is very important for SARS patients and those who come in contact with them to use good hand hygiene: washing hands with soap and water or using an alcohol-based hand rub frequently and after any contact with body fluids.

For people who are living in a home with SARS patients, and who are otherwise well, there is no reason to limit activities currently. The experience in the United States has not demonstrated spread of SARS from household contacts into the community. Contacts with SARS patients must be alert to the earliest symptom of a respiratory illness, including fatigue, headache or fever, and the beginnings of an upper respiratory tract infection, and they should contact a medical provider if they experience any symptoms.

#### EMERGING GLOBAL MICROBIAL THREATS

Since 1994, CDC has been engaged in a nationwide effort to revitalize national capacity to protect the public from infectious diseases. Progress continues to be made in the areas of disease surveillance and outbreak response; applied research; prevention and control; and infrastructure-building and training. However, SARS provides striking evidence that a disease that emerges or reemerges anywhere in the world can spread far and wide. It is not possible to adequately protect the health of our nation without addressing infectious disease problems that are occurring elsewhere in the world.

Last month, the Institute of Medicine (IOM) published a report describing the spectrum of microbial threats to national and global health, factors affecting their emergence or resurgence, and measures needed to address them effectively. The report, *Microbial Threats to Health: Emergence, Detection, and Response*, serves as a successor to the 1992 landmark IOM report *Emerging Infections: Microbial Threats to Health in the United States*, which provided a wake-up call on the risk of infectious diseases to national security and the need to rebuild the nation's public health infrastructure. The recommendations in the 1992 report have served as a framework for CDC's infectious disease programs for the last decade, both with respect to its goals and targeted issues and populations. Although much progress has been made, especially in the areas of strengthened surveillance and laboratory capacity, much remains to be done. The new report clearly indicates the need for increased capacity of the United States to detect and respond to national and global microbial threats, both naturally occurring and intentionally inflicted, and provides recommendations for specific public health actions to meet these needs. The emergence of SARS, a previously unrecognized microbial threat, has provided a strong reminder of the threat posed by emerging infectious diseases.

#### CONCLUSION

The SARS experience reinforces the need to strengthen global surveillance, to have prompt reporting, and to have this reporting linked to adequate and sophisticated diagnostic laboratory capacity. It underscores the need for strong global public

health systems, robust health service infrastructures, and expertise that can be mobilized quickly across national boundaries to mirror disease movements. As CDC carries out its plans to strengthen the nation's public health infrastructure, we will collaborate with state and local health departments, academic centers and other federal agencies, health care providers and health care networks, international organizations, and other partners. We have made substantial progress to date in enhancing the nation's capability to detect and respond to an infectious disease outbreak; however, the emergence of SARS has reminded us yet again that we must not become complacent. We must continue to strengthen the public health systems and improve linkages with domestic and global colleagues. Priorities include strengthened public health laboratory capacity; increased surveillance and outbreak investigation capacity; education and training for clinical and public health professionals at the federal, state, and local levels; and communication of health information and prevention strategies to the public. A strong and flexible public health infrastructure is the best defense against any disease outbreak.

Thank you very much for your attention. I will be happy to answer any questions you may have.

PREPARED STATEMENT OF JAMES G. YOUNG, M.D.

Mr. Chairman, and Members of the Committee: I am pleased to be here today to discuss with you the important issue of Severe Acute Respiratory Syndrome (SARS), and tell you about the effective measures we have taken to contain and control this new disease in Ontario.

I also wish to thank U.S. Consul General Antoinette Marwite and her staff for their strong support of Toronto during our SARS outbreak.

The Centres for Disease Control is also playing a key role in our efforts, and I will elaborate further on this in my remarks.

By way of introduction, I am a medical doctor who serves in a number of capacities within the Ontario government. I am the Assistant Deputy Minister of Public Safety and Security, the Chief Coroner for Ontario and Commissioner of Public Security. The public security office also coordinates Ontario's approach to terrorism, and manages emergency situations within Ontario, including such things as SARS, 9/11, Y2K and the Ice Storm of 1998.

The problem with responding to SARS has centered on the fact that we know so little about it. What is it? What are its characteristics? How is it spreading? When are people infectious? How do we test for it? And how do we control and treat it?

In the case of Toronto and the province of Ontario, we faced these questions very early in the known history of SARS and only knew that we were facing the challenge after the disease was already spreading in a local hospital.

Our index case is clear. A Toronto resident contracted SARS in an elevator in the Metropole Hotel in Guangdong China. That person returned to Toronto, became ill and died. The 43-year old son of that person went to hospital on March 16th for treatment of what turned out to be SARS, and while in the emergency department and after being admitted was not in respiratory isolation. This person in retrospect is believed to have been superinfective and our cluster of cases takes off from this point. This person and the next two persons who were infected through contact in that emergency department all went on to infect large numbers of other patients, health care workers and family members.

Initial information about SARS was only beginning to flow around March 16th, and it took time to recognize the initial hospital case and the other contacts from that case. Once that recognition was made, we imposed strict and effective isolation measures.

By this time, however, because of the highly infectious nature of our early cases, enough staff and patients were affected that the hospital was closed to new admissions, emergency cases, and transfers. We also started to alert the entire health care system.

On March 25th, we decided that a provincial health emergency should be declared in order to mobilize the full resources of the province. We decided to act quickly and boldly to attempt to eradicate SARS from our community. We started by restricting activity in all of the hospitals in the province while we put in place stringent infection control procedures. Everyone, including all staff, were checked for illness before entering a hospital. Staff were required to gown, glove, and mask in patient areas of hospitals; masks were provided for all patients entering an emergency department, and isolation was required for respiratory patients until their conditions were determined. Initially we also stopped all elective surgery, stopped any visitors or volunteers from coming to hospitals, and organized a new very strict system of ambulance transfers between hospitals.

On the community side we also took strong measures. Public Health vigorously tracked contacts of SARS cases and imposed 10-day isolation or quarantines for all contacts. If persons were found to be ignoring isolation orders, legal remedies were used. The public has also been encouraged not to go to work if they show early symptoms of SARS including headache, malaise or muscle ache, and before they develop fever. Frequent hand washing has been encouraged and a calm approach to the problem advocated. These measures continue to this day.

Before our initial measures had time to take hold, a transfer of a highly infectious patient occurred to a nearby hospital. This patient was another superinfectious individual, and this transfer resulted in more medical staff, their families and other patients getting SARS. This hospital was also closed.

These measures have proven to be effective. Both hospitals have now been through more than two incubation periods (20 days) without any further spread or new cases and so both hospitals are in the process of reopening. All our known SARS cases are in SARS units in our hospitals or, if well enough, at home in isolation finishing recovery.

March 16th was the critical date for Toronto and our SARS outbreak. As well as the patients and staff becoming infected, relatives of one patient who took their patriarch to hospital that night also became infected. They subsequently visited doctors, and a funeral home, and were involved in a religious community. This series of unprotected contacts took some time to trace and piece together, and is referred to as the BLD Cluster (named after the religious group). There were 31 cases within this group, and we ultimately isolated more than 500 people. There have been no new cases from this group since April 9th. It is very important to note that all of our so-called "community" cases track back to the original index case. We have had no sporadic or unexplained SARS spread in our community.

Over the Easter weekend we experienced a setback in our efforts. We had some incidents of SARS developing in medical staff working in SARS units. In one instance a very difficult and very long intubation in a SARS unit infected, we believe, 15 staff who were in attendance. We immediately rewrote our procedures, and we have invited Health Canada and the CDC to work with us to study this unfortunate event and recommend the best ongoing infection control standards for our SARS units. We appreciate the fact the CDC agreed to come and are working diligently and well with our people.

The most recent major blow to our efforts was the World Health Organization travel advisory issued against Toronto last week. WHO did not visit Toronto or discuss our outbreak, or its management, directly with us before taking this action; nor did they give us the required warning before issuing it. We believe that this advisory was based on old data and an incomplete understanding of our situation.

The WHO advisory unnecessarily and wrongly alarmed our own population, has resulted in huge economic loss, and has already demonstrated that it wastes valuable health resources in other countries such as the US by causing authorities to think they might have cases of SARS from Toronto when in fact there is no possible epidemic link to our cases. The WHO is currently reviewing its advisory and we urge that organization to immediately lift it based on scientific facts.

In fact, the CDC doctor currently working with us in Toronto has described our efforts as exemplary. The CDC disagrees with the WHO position and has correctly, in our view, talked about common sense precautions in its travel alert. The director is planning a trip to Toronto this week.

Finally, I will comment on where we are today.

We have SARS patients who are now well and back in the community. As of April 28th, Ontario had:

- 37 active SARS patients are in hospitals—17 fewer than one week ago
- 18 active SARS patients are at home finishing their recovery
- 20 SARS patients have died, and all but one of these had significant other medical conditions and most were elderly.

There has been no spread of SARS through casual community contact more than 20 days have passed since the last transmission among close contacts outside health care settings.

We continue to work with the CDC on infection control for our medical staff who are working within SARS units. This, along with finding and isolating new travel cases that arrive from outside Ontario, is our current challenge.

The streets of Toronto are as safe from SARS as the streets of London, Paris or Washington. In fact, a BBC reporter told me Saturday he saw far more masks and concern in London than Toronto. However, the lesson for all us that it only takes one case to start the new breakout.

Thank you for this opportunity to discuss our experience in Ontario. On behalf of the Ontario government, let me express our appreciation for your interest and understanding.

#### SARS AND THE TORONTO EXPERIENCE

*A report on what happened, why it happened, and the steps we need to take to manage future outbreaks*

When Severe Acute Respiratory Syndrome (SARS) first appeared on the global scene, it took the world by surprise. Less than two months ago, SARS was a virtually unknown disease: today it is a household name. While more than 40 countries have reported SARS cases, a few countries have been affected in an especially dramatic way. Canada is one of them. The Toronto area has been particularly affected, largely due to a series of unrepresentable circumstances during the early days of this disease, about which much is still unknown. But the Toronto situation is not completely a matter of bad luck; a lack of communication and the absence of political leadership were contributing factors. Now that the number of SARS cases is on the wane, it's evident that the Toronto medical community handled the outbreak well (and continues to do so), but it's equally evident that that perception did not always reach the community at large or the rest of the world. It's essential that clear protocols be put in place as soon as possible in order to prepare for the next time. And there will be a next time. Future outbreaks of infectious diseases and other medically related crisis, in Canada and throughout the world, are a certainty.

#### HOW SARS CAME TO CANADA

Here is a brief history of the birth, christening and first few months of the SARS outbreak.

Cases of atypical pneumonia are reported in Guangdong Province of China in November and December 2002 and January 2003.

Rumors reach the "WHO office in Beijing around February 10, 2003.

When Dr. L. Jianlun, who apparently brought the disease to the Metropole Hotel in Hong Kong, dies in February, no one at the hospital is infected and his history is not immediately shared with the local or international medical community.

After cases are reported from Canada, China, Hong Kong Special Administrative Region of China, Indonesia, Philippines, Singapore, Thailand, and Vietnam, an international alert goes out from WHO in Geneva on March 15, 2003.

What was previously described as an atypical pneumonia of unknown cause that was initially localized to China becomes known as Severe Acute Respiratory Syndrome (SARS).

Medical and public health officials worldwide are put on official alert.

#### TORONTO, CANADA

A 78-year-old woman (Case A) from Toronto is unknowingly exposed to SARS on February 21, apparently near or in the elevator at the Metropole Hotel in Hong Kong.

With a history of heart disease and diabetes, when she dies at home on March 5, it was reasonable for the coroner to attribute the death to heart attack (what I was told by a public health doctor).

When her eldest son (Case B) is taken to the emergency department of SG Hospital, a peripheral Toronto hospital, on March 7, it was reasonable to assume that he was suffering from a local, community-acquired pneumonia. He has no history of foreign travel. He is diabetic. There is no history of contact with a SARS patient, in that his mother died of a heart attack.

Owing to a chronic shortage of in-patient hospital beds. Case B spends about 12 hours in a crowded, high-patient-volume emergency department. As it is not yet routine to isolate and take respiratory precautions in cases of local community acquired pneumonia, none are taken.

After transfer to the ICU, Case B is thought to have pulmonary tuberculosis, which is not uncommon in the ethnic population served by the hospital. He is transferred to an isolation area.

Case C, who acquired SARS from exposure in the emergency department on March 7, comes back to hospital by ambulance on March 16. As a result of exposure to Case C, two paramedics, a firefighter, four emergency staff, one housekeeper and seven visitors who were in the emergency department are infected. C's wife and three other family members are also infected. When C was intubated, a face shield, mask, gown and gloves were utilized, suggesting performing the procedure likely acquired SARS from contact with C's wife. The doctor transmits the infection to one

member of his family. The seven visitors in the emergency spread the disease to live other people. In total, 15 cases of SARS can be traced back to C.

Case D, who was also exposed in emerg on March 7, is re-admitted to SG Hospital March 13 with a heart attack. He remains in the CCU with a fever, which is not uncommon after heart attach, until March 16, when because he requires kidney dialysis he is transferred to YC Hospital. (SG Hospital does not do dialysis.) Before leaving, D infects 11 people at SG Hospital.

On arrival at YC Hospital, D is not placed in isolation. D's wife is subsequently admitted to hospital for surgery on March 21. D and his wife likely spread the infection to nine staff and one patient at YC Hospital.

Case E, who died on April 1, contracted SARS in Emergency on March 16 from C or his wife. Members of E's family spread SARS on March 28 and 29 to a church group of some 500 people and during the visitation for E on April 3. Contacts of the group are traced and quarantined. Thirty-one people are classified as suspect or probable SARS in the Case E cluster.

In all of Ontario, suspect/probable SARS transmission can be traced back to a health care facility.

There were no cases attributed to spread in the general community.

One person broke quarantine (with the cooperation of his wife, who told public health he was at home) and attended his place of work. While symptomatic he had contact with a co-worker in a small room, resulting in the co-worker's becoming a probable case. The City of York MOH subsequently put the entire workplace into quarantine.

#### LEADERSHIP

##### *A. Political*

There did not appear to be much political leadership during this crisis. No one politician or community leader was perceived to be actively involved and present on the streets. A number of politicians organized press conferences at Chinese restaurants, to show that it was safe to visit the area known as Chinatown. Or they were pictured walking through hospitals wearing gowns, masks and other protective equipment. While the intentions were noble, I believe that this further drew attention to the Chinese community, who were not particularly involved in the spread of the infection beyond the initial cluster. It also focused attention on the hospitals, which were in some cases not allowing patients to have visitors and in other cases closed to even serious trauma and cardiac patients.

The Toronto mayor's term of office is soon to end, and he is not seeking re-election. Unfortunately, his once-excellent abilities as a municipal politician have deteriorated; perhaps owing to the hepatitis C he has been battling for several years, resulting recently in his being unable successfully to represent Toronto.

Health is a shared jurisdiction between the provincial and federal governments, but both the provincial and federal politicians have largely distanced themselves from the crisis. The provincial premier of Ontario might have called an election but for the SARS crisis and opinion polls, which were not optimal. The Prime Minister of Canada is near the completion of his final term of office. Both the premier and the prime minister took golfing holidays during the crisis. Both gave the impression that they would not interfere with the health issues and that they were powerless to deal, with the financial repercussions that they estimated could be in the billions of dollars.

Neither the federal nor provincial health ministers assumed a hands-on role. There is at least one example of information being released by a government minister in a manner that potentially compromised the confidentiality of an infected individual and embarrassed a hospital, for no useful purpose. In another instance, a political decision was made to release the name of a housing complex, even though public health was certain that a case in another unit was a suspected SARS and the incubation period was over.

The WHO recommended in late March that Canada step up screening measures at airports to help prevent SARS from spreading. Vancouver did take action, implementing a screening program involving mandatory written questionnaires for passengers and reports from flight attendants about ill passengers on incoming flights. But WHO felt that Canada implemented only the minimum of the recommended airport screening measures. In Toronto, signs about SARS were posted at the airport and leaflets were available, but none arriving and departing passengers were not screened at all. It's not known how effective infrared scanners are in detecting fever in travelers at airports—as of April 30. Singapore had screened 75,000 people at its airport without detecting a single case of SARS—but Toronto's lack of an airport screening policy only served to fuel public concern that the situation was not

under control. The appearance that something was being done might have gone a long way in lessening domestic as well as foreign anxiety.

When the WHO issued a travel advisory for Toronto on April 23, political figures appeared to be out of the loop. It was as if the advisory was made public without any prior notice to the high levels of government, which I expected should have been made as a courtesy.

A successful leader need not be the primary spokesperson. As we say during the Iraq crisis, President George W. Bush and General Tommy Franks were clearly the leaders, but each had a high ranking official attend the regular briefings. Mr. Bush was seen to be involved publicly with troops, civilians and internationally during the crisis. There Novas no doubt as to who was in control.

Anxious people require a reliable, professional, straightforward leader. They require reassurance that steps are being taken to protect their health and safety.

We have confidence in leaders who stand front and center, surrounded by outstanding professionals skilled in communicating confidence that all the appropriate steps have been anticipated and the crisis will thus be controlled. At the same time, it is paramount that the leader have the courage to act against the advice of his experts whenever necessary. Final decision making is more than simply understanding the scientific complexities. It must take into account the needs of the many as well as the political, economic and social consequences.

#### *B. Civil Service*

There needs to be a clear delineation of the roles of the federal, provincial and municipal governments. The decision-making responsibilities of all levels need to be unambiguous. My perception from watching television news conferences and reading the newspapers is that various levels had different agendas, which from my perspective did not necessarily serve the community as effectively as then might have.

It was apparent that the municipal medical officers of health had differing views on matters such as quarantine. This resulted in a situation where there were differences in decision making in adjoining municipalities. For example, had a business that was essentially closed down as a result of quarantine been in Toronto proper as opposed to a suburb, it would have remained open.

Managing a crisis via teleconference from another city is not acceptable. While the provincial and federal governments may see themselves as being progressively higher up the chain, it is the municipal public health department that is responsible for individuals at risk as well as those who have contracted the disease.

Levels that are one or more steps remote should not seek to control aspects of the process. A consensus should determine when, what and how often reporting back to them should occur. There is an absolute necessity for higher levels of government to be in the loop—but not predominantly by teleconference. Involvement might best be accomplished by providing vital human resources to join the local team, not as “spies” but as contributors providing expertise that may not be part of the local team. The exception might be when a toxic environment exists, making it unwise for senior people to risk exposure.

One would think it should normally be possible to establish a sound command post where representatives from all levels of government—and, when appropriate, the community—could run the campaign. Fixed briefing schedules should be possible in all but emergency situations where conditions are rapidly changing. Even so, in that scenario, minute-to-minute decisions would necessarily have to be made on site and not from a remote location.

#### PUBLIC SECTOR—COMMUNICATIONS

##### *A. From the Country's Senior Public Health Authority to the International Community*

Seemingly, information to the World Health Organization (WHO) from Health Canada was such that WHO published an advisory that was not in keeping with what Canadian and some international experts felt was based on factual, scientific information. This possibly suggests a communication problem between Health Canada and international bodies, including WHO. If lines of communication have not been properly established, they should be. If there are not clear criteria upon which advisories are based, then there should be. Making travel recommendations when not necessary and/or when actual risks have not been delineated resulted in unnecessary anxiety and significant commercial repercussions. After the SARS outbreak, occupancy rates in downtown Toronto hotels were down by half, 54,000 room nights were cancelled, one-third of hotel staff were laid off or had their hours reduced, and four major conventions were cancelled, including the American Association for Cancer Research, which alone caused losses of upwards of \$20 million. People wishing

to visit Canada have been unable to purchase health insurance. Decreases in travel and tourism have affected other areas of Canada thousands of miles from Toronto, where no cases of SARS have been reported have been affected. Although the WHO travel advisory lasted only six days, from April 23 to April 29, it's believed that the Toronto economy will be adversely affected for up to two years.

*B. Professional—from the Community to the Experts*

Community health workers have a moral and legal responsibility to report atypical or novel illness to the appropriate public health authority. Public health authorities must investigate in a timely manner and report to national and international agencies and bodies.

Failure to report at either level must be taken seriously.

Assurances that there be no government interference in the chain of reporting, particularly internationally, must be strictly enforced. Consideration must be given to creating criminal and/or civil repercussions for noncompliance resulting in the unleashing of an infectious disease locally or internationally. The international community must agree to support reasonable measures to prevent the nurturing, harboring and dissemination—accidental or intentional—of infectious disease.

*C. Professional—from the experts to the community*

Real-time global communication by email, tele/video conferencing, television and print is more available to professionals worldwide than ever before. The volume of communication in the Western world is such that we are an over-communicated society. There is so much information of variable quality and so little time to sort through it that we feel as if we're suffocating as we gasp for knowledge.

In Toronto, the Ontario Medical Association disseminates "important or timely" information to members—essentially all practicing physicians—by fax and/or email. There are, I suspect, practitioners who do not have a fax in their office and likely the majority have no email.

During the SARS crisis, I received emails from the two teaching hospitals that I am affiliated with; the University of Toronto, where I have a staff appointment; and the OMA. This is in addition to ProMed Mail and to my checking Web sites of WHO, City of Toronto and York Public Health Departments, the Ontario Ministry of Health and Long Term Care, Health Canada, The U.S. Centers for Disease Control. The Globe and Mail newspaper and the Canada Newswire for press releases.

I suggest that information to front-line health care workers; of an urgent/important/timely nature come from a single reliable source to avoid the waste of duplicated information. The composition of professionals on the single-source committee needs to be established. It should include a workable number of people with expertise to interpret the basic science and to put it into a form useful to front-line providers. There should be a clear protocol to determine content of all releases.

Every physician and, when appropriate, every regulated health professional must be assured of receiving necessary information. I suspect that most clinical settings have a computer utilized for billing purposes. Requiring mandatory on-line email capability may be an option. Certainly this should be required of every hospital, acute and chronic care facility and clinic.

The method of communication for urgent/important/timely information must not be utilized for other purposes. For example, during the SARS crisis, I received email from the OMA regarding election of officers and other matters.

Information must contain necessary basic information but must be more geared to providing practical advice, assistance and instruction to front-line health practitioners. Recommendations should be as simple and specific as possible.

An information/communications professional should be part of the releasing source, and all information should be edited and cleared by the specialist.

When information is based on partial knowledge or theories, this must be made clear.

Care should be given with regard to recommendations that may be difficult or impossible to follow. For example, a recommendation was made to us that staff should wear N95 masks and gowns and that patients should use hand sanitizer before entering the office, but materials and supplies were not readily available to comply with the recommendation.

In communities where it is not possible to rely on fax or email, alternative methods of communication need to be set up in advance, in preparation for the next crisis.

*D. Professional—from the Experts to the Hospitals*

In the Greater Toronto Area (GTA), there are some 22 hospital corporations, each with a board of directors, CEO and medical staff. There are also chronic care facilities, nursing homes, assisted living facilities and other health care institutions.

Communication has to come from a central leadership to ensure that there are uniform policies and procedures.

In this instance, there was confusion about what precautions hospitals would take and in what time course. Early on, hospitals outside the GTA were advised to take precautions that were likely not necessary. In some hospitals, out- and in-patient services were curtailed when there was no medical necessity to do so. Severe restrictions were placed on physicians. Sanctions were put in place to prevent physicians from working in more than one hospital. Some physicians were not permitted to work in private outside of hospital offices.

Conference calls between the 22 hospital CEOs, their senior staff and various levels of government are not likely the ideal method of communication.

A system needs to be established to link quickly all health care facilities involved in a crisis and to allow for rapid, effective communication to the central command. Hospitals require a senior administrator on 24/7 calls to respond as required.

Where necessary, in the case of crisis, legislation should be in place to allow a central authority to set hospital policy and procedure.

#### *E. From Professionals to the Public*

Ideally, one credible person on the local level should carry out communication to the public. This person should be perceived as the chief medical officer. The person may have a communications expert assist with, or be the primary speaker at press conferences.

The person should have medical credentials as well as an understanding of the health, safety, and community, social, economic and global issues. Ideally, the person should also have formal communications training.

Where possible, communication should be in the form of or supplemented by regular written media releases approved by a communications professional.

While designating non-government professionals to "expert" or "leadership" roles is an excellent idea, these people must have formal training or demonstrated ability in communication to the public. In this instance, there were people involved who chose unfortunate descriptive terms.

It is essential that accurate information be given to the media, since the media rely on the data they receive from those who are considered the experts or spokespersons. It is the nature of news that dramatic information or events, even when incorrect, gets front-page attention; a correction or retraction is much less noticed. For example, there was a clear but incorrect message from perhaps the most quoted local expert that the SARS virus could live on inanimate objects for 24 hours. The information was said to have originated from the U.S. Centers for Disease Control with the implication that it was credible, when in fact it was not. Likewise, it was worldwide news when three Canadian children suspected of having SARS were quarantined upon their arrival in Australia, fueling widespread alarm. It was a much smaller news story when the children were shown not to have SARS after all.

#### QUARANTINE

The use of quarantine was seen to be a draconian measure by some health care professionals. There was, however, no other effective way to control the spread of SARS.

As quarantine has largely been a procedure of the past, protocols need to be revisited. The media referred to "voluntary" quarantine, when in fact there was or should have nothing voluntary about it. Quarantine is mandatory. The medical officer of health has powers to detain people against their will. In that we respect rights and freedoms, the issue of quarantine needs to be dealt with prior to the next "crisis." The use of monetary penalties, involuntary confinement, police surveillance, electronic surveillance, etc., need to be examined.

The rights of the state to screen people for disease either unobtrusively or without consent requires guidelines and possible legislation. The following issues must be debated:

Should the state in time of urgency/emergency have the right to order non-invasive testing, such as estimation of body temperature, or invasive testing, such as blood tests, other biological samples or x-rays?

What rights should the state have to refuse entry to foreign nationals who may be at risk of being infected or spreading infectious disease? What criteria would be used to assess risk and classify individuals? Currently people with a history of harmful or violent behavior in association with a medical or psychiatric impairment require a waiver to enter the United States. Likewise, people with certain named diseases of public health significance (SARS is not on the list) fall into the "A" or non-admissible classification.

In the case of a person at elevated risk of a disease of public health significance who may or may not have symptoms, what right should the state have to detain the person or prevent the person from leaving the jurisdiction? Is there a right or duty to inform the jurisdiction to which the person intends to go?

What if any screening programs or protocols should be legal or mandatory at ports of entry?

What right does a common carrier have to screen or refuse passage to a person at elevated risk with or without symptoms? There have been reports of healthy Canadians, with no risk factors other than being a resident of Toronto, having vacation cruises cancelled.

Voluntary confinement also requires examination. Voluntary confinement is defined as going into isolation because of: 1. risk of potential but not confined or likely contact with an infection, or 2. manifesting non-specific symptoms with no specific history of contact.

At one point, when there was concern for the possibility of community spread, people were advised to remain off work or school and not to venture out in public if they had non-specific symptoms. Health professionals were advised to recommend a voluntary confinement of 24 to 72 hours, during which time it was suggested the individual would become sick enough that assessment in a secure facility (SARS assessment clinic or emergency department) was indicated.

The very young, the elderly and people with underlying medical conditions could be harmed by a period of voluntary confinement. There have been no such reports to date, but considering the varied nature of the early symptoms of SARS and the possibility of infection without serious respiratory symptoms, voluntary confinement could have resulted in serious repercussions.

#### CONFIDENTIALITY

Every effort must be made to protect the confidentiality of medical information. However, when the health and safety of a workplace of the community in general may be compromised, by maintaining confidentiality, there must be guidelines to allow needed information to be utilized in a responsible manner. If in order to determine which employees may have reasonably had close contact with an index case and thus be at risk to themselves and others, it may be necessary to break confidentiality. This should only be done when reasonably necessary and only by a regulated (licensed) health professional. It should be done with the clear understanding that the information released is confidential and that there would be a severe penalty for its further release. The media should be legally-bound not to release information that would normally be perceived as confidential in any form without written permission. I think this should extend to potentially identifying information. For example, it was not relevant that a nurse from Mt. Sinai Hospital rode the subway and commuter train, when all that needed to be said was that “a woman” made the journey.

#### HUMAN RESOURCES

Public Health (PH) Departments perceive themselves to be underfunded and understaffed. PH staffs are not accustomed to working extended hours, nor are they performing many of the functions required in an “urgency” or “emergency” on a daily or even periodic basis. Provision must be made to provide additional trained staff on an immediate basis and to ensure that there are adequate staffing levels for the necessary period of time.

Staff may be “borrowed” from neighboring jurisdictions, the private sector or the military. Preventive preparation should include details of the skill sets required for various urgencies and emergencies and rosters of professional who meet those qualifications. This will make calling up reserves a more seamless process. I am uncertain what the Canadian military could offer and what reserves exist in the public sector. Consideration should be given to establishing an active trained reserve force. Staff will suffer the effects of physical and emotional stress as part of the job. Provision has to be made in advance to accommodate anticipated needs.

People on the front lines may, owing to the nature of the catastrophe, be deemed contaminated, requiring voluntary confinement or quarantine. This may put strains on their families. Some health care professionals feel they are invincible and may go through periods of denial. Counseling and support will be necessary—in the event of a prolonged crisis.

#### INFORMATION TECHNOLOGY

Computer programs need to be developed for large-scale contact tracing. Provision needs to be set up to monitor perhaps tens of thousands of people over a course of

weeks. In that there will be overlapping municipal health units involved, provision needs to be built in for sharing of information. People often do not reside in the same jurisdiction where they work. Involvement with the private sector could result in information transfer, for quarantine and tracking purposes to public health. This would save resources and prevent inputting errors.

#### SOCIAL SERVICES AND SUPPORT

Quarantined people may require food, water, thermometers, medication, sanitary products, masks, gowns, etc. In addition to having a reasonable stockpile of medical supplies, one has to take into account all the other requirements that a confined person or family would normally require.

In the Toronto episode, there were logistical problems in delivering masks, gowns and other protective equipment to community doctors and health facilities. In that the government had made major purchases, many of these medical supplies were not commercially available.

Quarantine can also cause financial losses for workers. It is against everyone's interest for people in the workplace to spread disease to others, but some workers may balk at being quarantined, as they would lose pay. It is my strong recommendation that people be assured that if they are sent home on voluntary confinement or on quarantine by public health, they should not suffer financially. Employees' base pay should be maintained as a leave with pay. If they were impaired/disabled, they would then be entitled to whatever short-term absence benefits the business normally had. It would be possible to maintain pay as a loan with the employee applying for employment insurance benefits and then paying back the loan once employment insurance was received. This way, there would be no financial reason for a sick person to attend work.

During the height of the SARS outbreak, the Red Cross and other social agencies became overwhelmed, causing delays in the delivery of necessities to quarantined people. Logistics experts should likely do some contingency plans to more efficiently address these needs for the next urgency. Volunteers should be recruited, trained and made part of a reserve force. Likewise, hospitals and institutions require volunteers to screen people at entry points.

Methods of transporting infectious or contaminated people on an individual basis but in large numbers also need to be addressed. Are ambulances the answer for the walking wounded?

We must also take into consideration the needs of minors, the intellectually challenged and the psychiatrically impaired. One couple who became seriously ill with SARS and who remain hospitalized have two young children. When no relatives or social agencies, including Children's Aid, were willing or had facility to care for two quarantined children, pediatric hospital admission was the only option. One child was subsequently ill but recovered. Both remain in hospital, essentially because there is no other place for them at the present time.

#### CONCLUSION

Toronto has borne Canada's largest burden in dealing with the illness. But at the same time, it has successfully managed to keep the disease from spreading across the country and across the continent. One reason that Toronto appears to be a hot spot for SARS is that the medical community has quickly become very competent at identifying the illness in the first place, and Canada has been very forthcoming about making public the numbers of suspected and probable cases.

Still, the outbreak has served to highlight the weak spots in the system. SARS has been a wake-up call not only for Toronto but for the world. Infectious diseases will always be with us, and with the speed and volume of world travel, outbreaks can happen anywhere and spread faster than ever before. There will be other man-made and natural events that put great numbers of people at mortal risk. There was a time when spread of infection in the community and subsequent death was inevitable. We are not willing to accept that today. We expect a high level of leadership and an immediate successful response in order to prevent potential disaster. This makes it essential that we put systems in place now to more fully prepare before the next crisis strikes.

#### PREPARED STATEMENT OF SENATOR JOHNSON

Mr. Chairman, thank you for allowing me to submit my statement to the record for today's hearing on Severe Acute Respiratory Syndrome or SARS.

We live in a time when people can move freely around the globe with ease and people can travel from America to virtually every corner of the earth in a matter

of hours. This convenience provides great opportunities for international exploration by all of the world's citizens and for partnerships to be developed between countries, communities and societies.

But in this time of great mobility, we must be concerned about the ability of newly emerging microbial threats to spread across oceans swiftly and quietly. Flu epidemics of the past had the capacity to take millions of lives and destroy communities all over the world. And today, SARS is impacting the lives of thousands and threatening the economic stability of our near neighbors in Toronto and our friends far away in China.

Today we know that over 5000 people all over the world have suspected or probable SARS. Hundreds have died at a rate of 6 percent. We remain unaware of the period in which infected persons can transmit the disease. We remain unsure of the various modes of transmission and we are unaware of exactly why people in the U.S. appear healthier than those who contract the disease in other nations.

There are a lot of unanswered questions, but I know that CDC and the WHO are working hard, around the clock even, to find these answers as quickly as possible and I want to commend Dr. Julie Gerberding and CDC for their tireless work to conduct surveillance and provide public health information across this country. CDC has also provided extensive staff resources to the WHO which I know have been so important in helping identify cases quickly across the globe and have made a real difference in reducing the spread.

I also want to commend my colleagues in joining me to support the supplemental appropriation

funds that have provided an additional \$16 million dollars for the CDC this year to combat this new infectious disease. I know that I and other members of the appropriations committee would be interested to learn how CDC intends to utilize these funds and whether Dr. Gerberding considers this amount sufficient to address all disease control efforts including the development of diagnostic tests, antiviral drugs and vaccines.

We are aware of at least 41 probable cases of SARS and many suspected cases in the United States. Just last week, South Dakota reported its first suspected case of SARS, a man recently returning home from a trip to Hanoi. Luckily, he has returned home and I understand is recovering. Fortunately, the State Health Department was able to quickly identify this case and was able to take appropriate measures to protect health workers and the broader community from its spread. The challenge now for South Dakota and other states is to be able to identify all cases in an appropriate and timely manner. I am hearing from my state that they are in need of access to diagnostic tools as quickly as possible in order to be prepared to protect the public health. I hope CDC will continue to communicate with states about progress being made on the development of diagnostic tools and that CDC will work to disseminate these testing procedures as soon as possible.

As I mentioned earlier, SARS has not hit our country as hard as others. We should consider ourselves lucky that our citizens have not felt the fear that the people of other nations have experienced. Some Americans have however started to express concern. Some have bought masks. Some have been hesitant in airports or doctors offices. And others have stopped eating in Asian restaurants.

Actions similar to these may increase if we see more cases in America, resulting in economic hardships in our own communities. And with more cases, hesitancy can turn to fear, something that I know my colleagues and the CDC want to prevent. I encourage CDC and all of my colleagues in Congress to examine closely the experiences of other countries hard hit by SARS, and how they have handled economic hardships and broad fear by citizens and I hope we can work together to develop strategic plans to handle such issues, should the outbreak in the U.S. worsen. I look forward to working with my colleagues on this important issue and I thank the chairman for the opportunity to submit this testimony today.

#### PREPARED STATEMENT OF SAMUEL WALLACE

A wise man once said that those who do not learn from the lessons of the past are doomed to make the same mistakes again. After World War II, the entire world experienced an epidemic of the sexually transmissible diseases: syphilis and gonorrhea. The two diseases were categorized: "incurable" and efforts were made to quarantine those who had the disease and some people were deliberately infected with the disease as "experiments in the interests of science." The epidemic continued to spread not only in America, but also world-wide. And it was not until those with those diseases were treated with the Antibiotic Penicillin in sufficient dosages to cure those diseases that the epidemic was finally quelled.

Prior to the 1960's, Viral Illnesses such as the common cold, viral pneumonia, the measles and the mumps were treated and cured with Antibiotics. (See Goodman and Gilman's Pharmacology 1955 to 1958, p. 1388: "Tetracycline cures Viral Illnesses such as Viral Pneumonia". And in 1962 after Senator Kefauver Amended the FDA Act Requiring the use of Safe and Effective Medicines which were usually Antibiotics. The new law required the FDA to Tests for effectiveness representative of batches of each Antibiotic produced by each manufacturer mandatory. At that point the American Health Care System became so efficient that President Kennedy was able to reduce taxes and at the same time increase government revenues for the only time in American History. In the late 1960's President Nixon, announced: War on Cancer and rejected Elliot Richardson's nominee for Assistant Secretary of Health, Dr. John H Knowles of Mass. General Hospital who was an expert on Public Health and who had warned the country that the new trend of not using the Antibiotics to treat the sick was resulting in more mortalities and much higher medical costs particularly in the Public Health Sector. Had he been appointed and allowed to implement his ideas, he would have been able to save the country several trillion dollars in Health Care Costs up to the present. Today, it is now generally held as dicta that "the Antibiotics do not cure Viral Illnesses." Even though, I recall that the late Dr. Peter Marshall Murray M.D., my Uncle, a Surgeon and Officer in the AMA who could operate in any hospital in New York City told me that he prescribed the Antibiotics to Cure Viral Illnesses in 1957. Which can still be verified by prescription records in New York City, that fact indicates that it was common practice at the time.

ACQUIRED IMMUNE DEFICIENCY SYNDROME, (AIDS), like syphilis and gonorrhea was initially classified as "incurable" and so had an enormously high death rate. In recent years the most prevalent and mildest form of that disease, HIV 1, which is identical to "Cat Leukemia" found in medical and nursing students has begun to be cured with an ordinary course of Penicillin or Tetracycline and apparently many American doctors are curing both forms of the Disease with Empiric Antibiotic Therapy just as the American Cancer Society indicates in its Text: "Clinical Oncology" that it Oncologists now cure "Neutropenic Fever" in Cancer Patients routinely with Empiric Antibiotic Therapy. Which has reduced mortality for Neutropenic Fever by 95% in Cancer patients whose immune systems are compromised due to various causes. This is similar to the approach of over 51% of American Doctors who use similar Antibiotic Therapy to treat Viral Respiratory Diseases such as the common cold, influenza and viral pneumonia and perhaps Asthma. Though such Antibiotic Therapy is condemned by the NIH and CDC and this despite the fact that in 1955-1958 and onwards, the NIH co-authored Goodman and Gilman's: "The Pharmacological Basis of Therapeutics" which on page 1388 indicated that the Antibiotic Tetracycline cured such viral illnesses as Viral Pneumonia.

It appears that at the present time the death rate due to HIV AIDS in America has steadily declined. However, it is not certain whether this is due to the "empiric antibiotic therapy" similar to that used to treat medical and nursing students who have "cat leukemia" acquired by dissecting cats, which is also used by 51% of American Physicians to also treat Respiratory Viral Illnesses or whether it is due to an increased morality among Americans generally. However, AIDS has continued to increase at an alarming rate not only in Africa, but also in Eastern Europe and in Asia, particularly in China and Thailand, but not in Japan where doctors rely far more heavily on Antibiotic Therapy or apparently the Philippines, perhaps for the same reason.

The countries of Eastern Europe and Russia, at one time had excellent Public Health Systems. Those Public Health systems have been largely abandoned, as have free medical education. Doctors there no longer as a general rule prescribe Antibiotics for the sick. And medical costs there have begun to soar and the health of most of their people have begun to decline significantly, particularly in Russia.

India which once had one of the best Public Health Systems of any developing country in the world to treat its poor was in the early 70's induced by the IMF to privatize its entire Health System and as a result with the exception of the Indian States of Bangor, Kerala and Madras, there are no longer Public Health Systems in India available for the poor. Last year, the President of the World Bank, Mr. Wolfson held hearings on this issue and he and his panel recommended that India adopt the Public Health Systems and its policies of the three Indian states that still have free Public Health for the poor. As a result, the Indian State of Kerala whose Public Health System relies heavily on Antibiotics has a lower rate of Infant Mortality than the District of Columbia where many doctors follow NIH guidelines with respect to treating illnesses with Antibiotics. Tragically this is not true for the remainder of India for reason just stated above.

Today, China like Russia has begun to abandon its rural Public Health Systems which means as reported by some Reporters the rural poor have begun to suffer greatly because they can no longer obtain the curative Antibiotic Medicines for their Bacterial and Viral Illnesses which were once provided by their Public Health workers, nurses and practitioners who delivered Health Care to the poor living in rural areas.

Right next door to the beautiful city of Hong Kong lies Guangdong where most of Hong Kong's food animals are raised. It is a poor rural area where poor peasants live in poverty in close proximity to poultry and live stock without the benefits of good drinking water etc. And where in the past once an occasional viral anomaly, such as the Hong Kong flue briefly developed, such a virus was defeated by antibiotic therapy in a relatively short period of time by Public Health Nurses administering antibiotics to people living in the outlying rural areas. But today in China the poor in neighboring rural areas can no longer expect to obtain such care and either must overcome their disease by endurance or else succumb to it.

Now, in China, as the Public Health System there has begun to breakdown in rural China, the Chinese are now faced with a deadly new Pneumonia-like Virus, SARS, which is even is deadly to Nurses and Doctors who normally have access to the curative Antibiotic Medicines and are normally less like to become Infected with such respiratory viruses. And so SARS today is raging throughout China and it is not even certain whether doctors there today are even prescribing the appropriate Antibiotics in the affluent urban areas and hospitals. Because so many even there appear to be infected with SARS.

So the lessons of the 1950's have been forgotten that if you wish to stop an epidemic, you must cure the sick generally with the common antibiotics such as penicillin or tetracycline which prevents the Virus or Bacteria from continuing to spread from one sick person to another.

And here we are learning once more that If you do not, you may experience a devastating epidemic. So far perhaps as many as 6,000 people are infected with SARS in China. And at least 500 people have died from that deadly Virus. And this is because of the deadliness of this new Pneumonia like virus and because the Chinese Public Health System has begun to fail.

But here in the United States we have a Public Health System lead by our CDC, NIH etc. that experiments with one fad after another in treating Viral Illnesses, but consistently denies the Antibiotics cure viral illnesses-even though 50% of American doctors prescribe the Antibiotics in the treatment of Respiratory Viral Infections such as Influenza and Viral Pneumonia.

In Puerto Rico where its doctors attend American Medical Schools a report in the HCFA Journal by a Miss Pagan of Puerto Rico indicated that the Puerto Rican Health Care System was 95% more efficient than the mainland Public Health System . Which I know as a former Public School teacher there was because the Puerto Rican Public Health System relies heavily Antibiotics to treat Bacterial and Viral Illnesses.

It is because of CDC and NIH Policies no longer believes that antibiotics cure viral illnesses as they once did that they condemn the majority of American doctors who prescribed empirical antibiotic therapy to treat Respiratory viral infection while ignoring that as many as 15,000 Americans die of Influenza and thousands of Asthma because they condemn the doctors use of the very same antibiotic medicines that the NIH. once claimed or admitted cured viral illnesses. 1 /

Therefore, while the world is witnessing the beginnings of the demise of Public Health Systems in Eastern Europe, Russia and now in China and other parts of Asia, the United States experiences each year 15,000 deaths due to the Influenza Virus! Because the NIH and CDC lead what is essentially a failed Public Health System here in the United States due to their disastrous Public Health Policies condemning doctors for prescribing Antibiotic Medicines that they once admitted cured the sick. /

I personally know this is true because I lived for 5 years in Brazil from 1969 to 1974, where Antibiotics could be purchased over the counter in small quantities without a prescription. I therefore tested the Antibiotics against a wide range of viral, bacterial and protozoa illnesses. Which I testified about before the Subcommittee of Health of the House Ways and Means Committee Dec. 4th, 1975 indicating that the times of cure were reduced by 30 to 50% when a Nasal Decongestant Nose Drops was combined with one or two grams of Penicillin per ounce of a Nasal Decongestant such as Rimidol made by Squibb Industria Brazil of Sao Paulo. Which should be applied as Nose Drops three or four times per day.

Such therapy is nonspecific innate therapy where the antibiotics activate the macrophage which in turn activates complement and immediately begins the curative process. This is scientifically demonstrated by observing that as soon as the An-

tibiotic Nose Drops are applied any fever is immediately reduced to normal temperatures. This therapy which is so safe that it can be given to infants in reduced strength cures most forms of Viral Pneumonia in three days time and is such a non-specific form of Antibiotic Therapy that it was called: "Penicillin diversum" by the Japanese Pharmaceutical Industry in Chemical Abstracts, April 15, 1985, Vol. 102, #15:

130454m:"Production of antitumor agent PD-3. (I) ...[88899-01-8] was produced from cultures of [Penicillium diversum]...PD-3, The antitumor antibiotic, "...inhibited growth of Yoshida Sarcoma cells by 98%" ...Institute of Physical and Chemical Research. Japan. Kokai, Tokyo, Koho, Japan.

I personally discussed this formula in my testimony 1975 which is quite similar to the Nasal Decongestant Rimidol made by Squibb in Sao Paulo which is composed of Naphazoline Hcl in .1 of 1% sol. Combined with 1 or 2 grams Penicillin k or ampicilin per ounce of Nasal Decongestant Nose Drops in Congressional Testimony, Subcommittee of Health of the House Ways and Means Committee, Dec. 4th, 1975, Testimony Samuel B. Wallace where I emphasized that it could cure Viral Respiratory Illnesses such as Influenzas and Viral Pneumonia in three days time as well as bacterial infections such as cholera and Protozoa Illnesses such as Malaria.

My Research with the Penicillin Nasal Decongestant Nose Drops Rimidol indicates that that formula could cure a wide range of viral respiratory illnesses such as SARS in approximately 3 days. And because such treatment treats the entire blood and entire glandular system to which the Lungs are attached it becomes impossible for the treated patient to become a carrier of the disease since the disease is removed from the entire system. And this route of administration is important in China because it does not use the injection of needles which are often reused and sometimes spread the infection. The cost of manufacture of Penicillin and the Nasal Decongestant in China is relatively low and to make such effective medicines available is far cheaper than building new hospitals. Since the Japanese found that the same formula was effective against Yoshida sarcoma or bone marrow cancer in vitro 98% of the time-the highest rating for any Cancer Agent. That means that it would also be effective against less virulent virus infections, hence that named the same formula that I had tested in Brazil from 1969 to 1974: "Penicillin diversum" So in any event, the contemporary SARS epidemic does teach us that there is still a need for good Public Health Systems as well as good common sense Public Health Policy in the world that hopefully still use the low cost safe and effective medicines in developing countries where so many poor people are unable to afford even ordinary Health Costs.

The SARS Epidemic in China also teaches us that indifference to the poor in Health Care matters does not necessarily allow the more affluent areas to escape the consequences of such neglect of the poor. And that in order to protect all good Health Care in some reasonable form must be available to all.

The economic issues are also important. The SARS epidemic has already cost the nations of Asia billions of dollars in lost trade and tourism. Which is a very high price for poor Public Health and Health Policies and Procedures that ignore the value of the low cost safe and effective Antibiotic Medicines for panaceas that do not work. Particularly where such countries are faced with a Virus readily treated and cured with Antibiotics yet powerful enough to even fell nurses and doctors in their communities.

The governments and the Public Health Systems of Japan and amazingly Viet Nam, a country much poorer than China and the Philippines should be singled out for praise in using the best Antibiotics available to them in the treatment of SARS which is a very deadly virus, indeed. While the doctors in Hong Kong should be reminded that they have a responsibility to treat and cure the sick. And not to just posture and ignore the plight of their sick countrymen. And of course there should be studies by universities in China directed toward improving the plight of the poor including their Health, Nutrition, Water and Sanitation in the rural areas of China which produce its vital food supplies.

Another example, of poor Public Health Policy is subsidizing the Pharmaceutical Industry by encouraging it to use "Antiviral Agents" which its manufacturers and numerous studies prove do not cure HIV AIDS. Since the low cost safe and effective Antibiotic Medicines that have proved effective in Curing HIV I and III Leukemia, cost only pennies per patient. The cost of quelling the AIDS epidemic in developing countries is much less than the costs of providing medicines which do not cure at all. Experience has shown that such epidemics can not be stopped until the disease is cured world wide as occurred in the 1950' when the epidemic of Syphilis and Gonorrhea was quelled when finally the antibiotics were administered to patients and there were cured. Therefore stopping the AIDS epidemic with "Antiviral Agents" and weak protease inhibitors is not a solution, but rather is a government largess

for the richest industry in America-the Pharmaceutical Industry. Such a policy promoting the world wide use of ineffective panaceas is like fighting fire by pouring oil on the flames. Evidence that this is true is seen by the fact that Japan where Antibiotics are used to Cure AIDS Japan has a very miniscule incidence of AIDS because it is cured almost as soon as it is diagnosed.

1/ The Pharmacological Basis of Therapeutics, P. 1386, Tetracycline's:

THERAPEUTIC USES (OF TETRACYCLINE) (PARENTHESES ADDED)

"The Tetracyclines are firmly established as extremely valuable therapeutic agents in the treatment of a variety of diseases caused by microorganisms". Among the infections for which tetracycline are of proved value "viral diseases". These Antibiotics are also, of benefit in primary viral pneumonia"

2/ a nonspecific form of Antibiotic Therapy that it is called: "Penicillin diversum" by the Japanese Pharmaceutical Industry in Chemical Abstracts, April 15, 1985, Vol. 102, #15:

130454m:"Production of antitumor agent PD-3. (I) ...[88899-01-8] was produced from cultures of [Penicillium diversum]...PD-3, The antitumor antibiotic, "inhibited growth of Yoshida Sarcoma cells by 98%" ...Institute of Physical and Chemical Research. Japan. Kokai, Tokyo, Koho, Japan.

3/ Penicillin diversum's 98% effectiveness in vitro is the highest rating ever given to any Anticancer Agent in Vitro including Adriamycin praised by the American Cancer Society which like Penicillium Diversum is a Naphazoline Hcl compound to which is added Streptomycin rather than Penicillin.

However, both Dr. Bonadonna and the late Dr. Hamao Umezawa both indicated to me that Penicillin was more effective in treating Cancer as did the Japanese Pharmaceutical Industry Immediately above discussing [Penicillium Diversum] in Chemical Abstracts 1985.

I personally discussed a similar formula in my testimony 1975 which is a Nasal Decongestant Rimidol made by Squibb in Sao Paulo composed of Naphazoline Hcl in .1 of 1% sol. Combined with 1 or 2 grams Penicillin k or ampicilin per ounce of Nasal Decongestant Nose Drops in Congressional Testimony, Subcommittee of Health of the House Ways and Means Committee, Dec. 4th, 1975, Testimony Samuel B. Wallace where I emphasized that it could cure Viral Respiratory Illnesses such as Influenzas and Viral Pneumonia in three days time as well as bacterial infections such as cholera and Protozoa Illnesses such as Malaria.

My Research with the Penicillin Nasal Decongestant Nose Drops Rimidol indicates that that formula could cure a wide range of viral respiratory illnesses such as I project SARS in approximately 3 days. And because such treatment treats the entire blood and entire glandular system to which the Lungs are attached it becomes impossible for the treated patient to become a carrier of the disease since the disease is removed from the entire system. This route of administration is important in China because it does not use the injection of needles which are often reused and sometimes spread the infection. The cost of manufacture of Penicillin and the Nasal Decongestant in China is relatively low and to make such effective medicines available is far cheaper than building new hospitals. Since the Japanese found that the same formula was effective against Yoshida sarcoma or bone marrow cancer in vitro 98% of the time-the highest rating for any Cancer Agent. That means that it would also be effective against less virulent virus infections, hence that named the same formula that I had tested in Brazil from 1969 to 1974: "Penicillin diversum"

4/ a Nasal Decongestant Rimidol made by Squibb in Sao Paulo composed of Naphazoline Hcl in .1 of 1% sol. Combined with 1 or 2 grams Penicillin k or ampicilin per ounce of Nasal Decongestant Nose Drops was obliquely described in Goodman and Gilman's, The Pharmacological Basis of Therapeutics 1955-1958, on pages 1346 and 1347beginning on page 1346::

P. 1346:4. Penicillin for Inhalation Therapy. Penicillin is employed in several forms and by various techniques for inhalation therapy of bronchorespiratory tract infections....

P. 1347: Penicillin is inhaled through the Nose...similar bronchodilator drugs can be incorporated in the penicillin solution for use in patients requiring both antibiotic and antiasthmatic therapy...the usual dosage is 199,999 units of penicillin applied three times daily.

My testimony before the Subcommittee of Health, House Ways and Means, Dec. 4, 1975:

Indicates almost the exact quantity of Penicillin to be applied to patients with respiratory illnesses. Which is ten percent of that recommended by the Physicians Desk Reference or one gram capsules of penicillin for Pneumonia.

And in addition I indicated in the same Congressional Testimony of Dec. 4th, 2003 that a Nasal Decongestant nose Drops such as Rimidol combined with Penicillin reduces Viral, Bacterial and Protozoa Fevers as soon as it is applied as Nose

Drops. (I indicated within one day because I did not feel confident that any one would believe me if I indicated the precise true time which was within seconds of its application as Nose Drops. This can be verified as I suggested previously to the NIH in one day pilot tests against any type of fever.

Dr. Fauci indicated on the Ted Koppel television program that he did not believe that a vaccine would be developed for SARS in less than three years time. He did express some optimism about finding a new drug that cured it because SARS is "tissue sensitive." Thus, it is a virus that like Yoshida Sarcoma and Viral Pneumonia can be readily tested in Test tube against various medicines, including I suggest Rimidol (or Naphazoline Hcl combined with Penicillin K.

And since it is both Safe and Effective and very quick to cure Pneumonia as my Research in Brazil and subsequent testimony in 1975 as well as the great research on the very deadly virus: Yoshida Sarcoma by the Japanese Institute indicate, I suggest that it should be given expedited

Consideration for testing against the SARS Virus in vitro and in vivo. In order to save lives and in order to end this deadly Virus before it becomes Endemic everywhere.

[Whereupon, at 3:58 p.m., the committee was adjourned.]

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