



**Testimony
Before the Senate Standing Committee on
Social Affairs, Science, and Technology
Senate of Canada**

**CDC's Response to Infectious Disease
Threats including Preparedness Planning
for Severe Acute Respiratory Syndrome
(SARS)**

Statement of

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Good afternoon. I am Dr. James M. Hughes, Director, National Center for Infectious Diseases, United States Centers for Disease Control and Prevention (CDC). Thank you for inviting CDC to participate today in this study on a critical public health issue: strengthening public health infrastructure and responding to infectious disease outbreaks. The emergence of severe acute respiratory syndrome (SARS) this past year is a timely example of the importance of this topic as well as its direct and immediate relevance to both of our countries.

Despite modern advances, such as antibiotics and vaccines, infectious diseases are a continuing threat to global health. The emergence of new threats, such as West Nile encephalitis, vancomycin-resistant *Staphylococcus aureus* (VRSA) infection, hantavirus pulmonary syndrome, SARS, and monkeypox, are dramatic reminders that we must remain vigilant in our efforts to address emerging infections. Our recent experiences with SARS are also clear indications that infectious diseases recognize no boundaries and require increased global awareness and strong collaboration with domestic and international partners for effective response. Protecting the public's health is CDC's domestic mission, and today I will update you on our ongoing role in responding to domestic and global infectious disease threats and on our activities to prepare the United States for a possible recurrence of SARS.

Emerging Global Microbial Threats

Since 1994, CDC has been engaged in a nationwide effort to revitalize our 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 rapidly. It is not possible to adequately protect the health of our nation without addressing infectious disease problems that are occurring elsewhere in the world.

In March 2003, 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 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 calls for the United States to increase its capacity to detect and respond to national and global microbial threats, both naturally occurring and deliberately released, and provides recommendations for specific public health actions to meet these needs. Summaries of the new IOM report along with copies of CDC's current strategies to prevent emerging infectious diseases have been provided to the Committee.

The IOM report presents a broad spectrum of recommendations to address emerging microbial threats to health. Key among these is the need to improve global surveillance and response capacity for infectious disease threats. The report calls for a comprehensive surveillance system for global infectious diseases and an intensified effort to develop and arrange for distribution of laboratory diagnostic reagents needed for global surveillance and technology transfer between nations. CDC is intensifying its collaborations with WHO and other partners to create a comprehensive global network that detects and controls local outbreaks before they become worldwide pandemics. A major focus of that work is to develop and expand fledgling regional disease surveillance networks that include less developed nations as members. In the years ahead, these networks can expand, interact, and become the building blocks of a worldwide "network of networks" that monitors priority diseases of global concern (including pandemic influenza, drug-resistant diseases, and diseases caused by biological agents) and provides early warning of new and re-emerging threats. CDC can play a major role in helping to develop the WHO Global Outbreak Alert and Response Network (GOARN) into the backbone of this global "network of networks"—a network that will verify disease surveillance reports from national and regional sources and coordinate international outbreak responses. CDC's International Emerging Infections Programs (IEIPs) are part of this strategy. Currently established in Thailand since 2002, with implementation in Kenya anticipated for early 2004, the IEIP sites are designed to strengthen national public health capacity and provide hands-on training in laboratory science, epidemiology, and public health administration. These centers are a partnership between the ministries of health and CDC, with additional partners that include one or more local universities, medical

research institutes, Field Epidemiology Training Programs, and U.S. military laboratories. The sites also maintain close ties with WHO Country and Regional offices.

Domestically, CDC works with other federal agencies, state and local health departments, and other partners to strengthen our nation's capacity to recognize and respond to challenges posed by emerging infectious diseases and the threat of bioterrorism. As part of this effort, CDC provides assistance to state and eligible local public health agencies through cooperative agreements designed to strengthen public health infrastructure for responding to infectious diseases. A major component of this effort has been the establishment of the Laboratory Response Network, or LRN. The LRN is an extensive partnership among an expansive range of biologic and chemical laboratories across the United States, which provide rapid and critical response to address both naturally occurring and intentional infectious disease outbreaks. Currently, the LRN comprises more than 110 laboratories. Two other major cooperative agreements are the Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) program and the Emerging Infections Programs (EIP). The ELC program, implemented in all 50 states, 6 major cities, and Puerto Rico, focuses on notifiable diseases; foodborne, waterborne, and vectorborne diseases; vaccine-preventable illnesses; and drug-resistant infections. Strengthening collaboration between laboratory and epidemiologic activities is a crucial component of this program. The EIP is a population-based network of CDC and state health departments working with collaborating public and private health organizations to combine specialized epidemiologic and laboratory expertise that will allow them to expand beyond the functions of local health departments. Currently, the EIP network is

now in place in 11 locations around the country. In many instances, these programs have significantly improved our ability to respond to infectious disease emergencies.

Another important recommendation in the 2003 IOM report calls for the establishment of interdisciplinary infectious disease centers. These programs would enable experts from various disciplines to work together to address microbial threats to health. They would also facilitate the development of a highly trained and diverse workforce to address the complex problems posed by infectious diseases. Towards this end, CDC has joined with the National Institutes of Health and other federal agencies that support extramural research in biodefense and emerging infectious diseases. CDC's new program emphasizes opportunities for innovative research in surveillance and detection, environmental sampling, and prophylaxis and treatment, with the goal of strengthening preparedness and response for both bioterrorist events and naturally occurring infectious disease outbreaks.

SARS: A Global Outbreak

As you are acutely aware, in early 2003, cases of what would later be called SARS began to be reported from several countries in Asia. This new disease, designated SARS by WHO, spread globally in a matter of weeks producing devastating effects on health as well as far-reaching social and economic consequences.

While SARS presented and continues to present major challenges, it also serves as an excellent illustration of the extraordinary efforts and intense spirit of collaboration among

the international clinical, scientific, and public health communities to combat a global epidemic. WHO's coordination of the global response provided an opportunity for CDC to participate in providing international assistance and sharing of critical information that helped to minimize the spread of SARS and rapidly identify the causative agent.

Domestically, CDC's response to the outbreak was coordinated through the new Marcus Emergency Operations Center, which facilitated widespread participation by more than 800 individuals throughout the agency. During the early months of the outbreak, CDC staff, as well as expert consultants, met multiple times daily to share new information and coordinate response efforts. Several individuals from Health Canada were invaluable participants in these meetings. CDC's response also involved the formation of topic-specific response teams that enabled researchers to rapidly obtain, assess, and share large amounts of information about the illness. Rapid dissemination of this information was facilitated through CDC's web site, regular press conferences, and global videoconferences as well as regular communications and teleconferences with state epidemiology and laboratory personnel and with clinicians, virologists, the academic community, and professional organizations and groups, such as the Healthcare Infection Control Practices Advisory Committee. Because of these response efforts, existing collaborations have been strengthened and new ones formed both nationally and globally, including new liaisons with the transportation industry and airline unions.

In the United States, we have been lucky; no deaths have been attributed to SARS. State and local health departments reported a total of 344 suspect and 74 probable cases to

CDC. These numbers would subsequently be revised following a change in the U.S. SARS case definition which allowed for exclusion of cases whose convalescent serum specimens tested negative for evidence of SARS-associated coronavirus (SARS-CoV) infection. This change was recommended in mid July by the Council of State and Territorial Epidemiologists, in consultation with CDC, and is based on scientific data which indicate that more than 95% of SARS patients mount a detectable antibody response in convalescent serum. Exclusion of these SARS CoV-negative cases provides a more accurate indication of the magnitude of the epidemic in the United States. On July 18, CDC revised the laboratory criteria in the SARS case definition to require that convalescent serum specimens be collected more than more than 28 days after illness onset. The revised total of SARS cases in the United States through October 21, 2003, is 137 suspect and 27 probable, including 8 confirmed.

Lessons Learned

Since reporting of new cases has slowed, CDC and other global and domestic partners are taking the opportunity to assess lessons learned from the outbreak and response and to develop and enhance response plans for future SARS epidemics. In reflecting on the spread of this new disease and the international response to it, there are many lessons that can be applied to emerging infectious diseases in the future. Key among these is the importance of strong national and international partnerships. The response to the outbreak of SARS demonstrated the crucial importance of global cooperation to monitor the spread of new and dangerous diseases, whether naturally occurring or intentionally spread. As CDC director Dr. Julie Gerberding has said, the SARS epidemic was

characterized by global expansion, but our response to it was characterized by global collaboration.

Another important lesson learned is the need for strengthened collaborations among the epidemiology, clinical, laboratory, veterinary, and public health communities. The most sophisticated detection and response systems available will work only when staffed by astute individuals who are in communication with their partners in other disciplines. We have also become increasingly aware of the importance of preparedness planning for infectious disease outbreaks, including proactive communications with decision makers, healthcare providers, the public, and the media; training for healthcare workers and state and local responders; and on-going education for clinicians.

Preparedness Planning

We do not know if SARS will reappear, but we must assume that it will. Possible sources of the virus include the original animal reservoir or other SARS-infected animals, unrecognized transmission in humans, persistent infection in humans, or the laboratory. Since other respiratory viruses are seasonal, it is possible that SARS may be more likely to reestablish infection and spread during respiratory virus season: fall, winter, and spring. In preparation, we need to have in place a system that will allow for quick detection of an introduction of SARS while minimizing unnecessary concerns over non-SARS cases.

In June, more than 1,000 individuals highly involved in the worldwide SARS response attended the WHO Global Conference on SARS to review scientific knowledge and lessons learned and to develop priorities for future action. Recommendations were made in several critical areas including epidemiology, surveillance and response coordination, clinical management and diagnosis, reducing transmission in health-care settings, laboratory and environmental issues, and zoonotic disease research. CDC is playing an important role in addressing these recommendations and is assisting WHO in conducting an evaluation of the effectiveness of control measures used by other countries to limit the international and community spread of SARS.

Within the agency, CDC is preparing for the possible return of SARS and the different levels of spread that might be associated with a resurgence of SARS. We are fortunate to be able to incorporate the direct experience of CDC staff who served in areas heavily affected by the SARS epidemic as well as numerous expert international collaborators who successfully battled serious SARS outbreaks in Canada, Vietnam, Hong Kong, Singapore, China, Taiwan, and elsewhere. We have established a SARS Preparedness Committee that includes the following eight working groups: Surveillance, Clinical Management, Preparedness in Healthcare Facilities, Community Response, Laboratory Diagnostics, Information Technology, Communication and Education, and Special Studies. These working groups are preparing for the possible return of SARS with active and ongoing consultation and collaboration with other federal partners, state and local health officials, and professional organizations and societies. The response activities will

be adapted to the level of global and local SARS activity and designed to efficiently and quickly detect introduction of SARS into the United States.

Through these working groups, CDC has developed a draft guidance document, *Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS)*, that provides a framework and strategies that would guide the United States response to a SARS outbreak and describes many of the activities needed at the federal, state, and local levels to prepare for and respond rapidly and decisively to a reemergence of SARS. The information in the document is based on lessons learned from the 2003 global SARS epidemic and the advice and suggestions of domestic and international public health and healthcare partners. CDC has made the document available in draft form to assist local and state public health and healthcare officials in their preparations for a possible reemergence of SARS during the approaching respiratory disease season and to solicit comments from interested public health partners. The document is currently undergoing external review by partner organizations and other federal agencies and will be updated as necessary to incorporate comments from reviewers and to reflect increased understanding of SARS-CoV transmission dynamics and the availability of improved prevention tools. The document is available at <http://www.cdc.gov/ncidod/sars/sarsprepplan.htm>.

CDC's guidance document presents a strategic framework for communities to plan and prepare for the reappearance of SARS and respond to a SARS outbreak. Directed to U.S. state and local health departments, healthcare facilities, and healthcare personnel, the

document provides strategies, guidance, and tools for SARS preparedness and response. It addresses both the rationale and the strategies for SARS preparedness and response and provides a foundation for the development of more detailed operational plans and procedures for responding to SARS at the local, regional, and national levels. Suggested activities include those needed to prepare for an introduction of SARS, to quickly detect possible SARS cases and clusters, and to prevent and contain the transmission of SARS-associated coronavirus.

The basic strategy used to successfully control the SARS outbreaks worldwide was rapid and decisive surveillance for and containment of suspect and probable cases. The keys to successful implementation of such a strategy are up-to-date information on local, national, and global SARS activity; rapid and effective implementation of control measures; and the resources, organizational and decision-making structure, and trained staff vital to rapid and decisive implementation. Many of the approaches and activities for preparedness and response to SARS are similar or identical to those involved in combating other infectious diseases, such as pandemic influenza and intentionally spread smallpox or plague.

Conclusion

The SARS experience reinforces the importance of global collaboration, global surveillance, and prompt reporting that is 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 develops, disseminates, and implements plans to strengthen the United States' public health capacity to respond to SARS and other emerging global microbial threats in the future, we will continue to build upon the invaluable collaborations we share with Health Canada and our other global partners. We will also continue to strengthen our collaborations with state and local health departments, academic centers and other federal agencies, healthcare providers and healthcare networks, international organizations, and other partners. 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.