



**Testimony
Before the Permanent Subcommittee on
Investigations
Committee on Governmental Affairs
United States Senate**

**CDC Preparedness Planning for
Severe Acute Respiratory Syndrome
(SARS)**

Statement of

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Good morning, Mr. Chairman and Members of the Committee. I am Dr. James M. Hughes, Director, National Center for Infectious Diseases, 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, on CDC's response in collaboration with the World Health Organization (WHO) and other domestic and international partners, and on CDC's activities to prepare our nation for potential future epidemics of SARS.

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 West Nile encephalitis, vancomycin-resistant *Staphylococcus aureus* (VRSA) infection, hantavirus pulmonary syndrome, and monkeypox. SARS is a dramatic reminder that we must always be prepared for the unexpected. SARS also indicates that infectious diseases know no boundaries 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.

A Global Outbreak

In early 2003, cases of severe atypical pneumonia of unknown etiology began to be reported from several countries in Asia. This new disease, designated SARS by WHO, spread globally in a matter of weeks, infecting primarily health care workers and other close contacts of index patients but also resulting in community transmission in several areas. As of its latest update of July 11, WHO has received reports of more than 8,000 cases and 800 deaths among individuals from nearly 30 countries. In addition to its

devastating health impact, the SARS outbreak has also had far-reaching social and economic consequences.

In the United States, the Council of State and Territorial Epidemiologists, in consultation with CDC, recently recommended a change in the U.S. SARS case definition to allow for exclusion of cases whose convalescent serum specimens tested negative for evidence of SARS-associated coronavirus (SARS-CoV) infection. Convalescent serum specimens are those that were collected more than 21 days after illness onset¹. The recommendation to exclude these cases is based on scientific data which indicate that over 95% of SARS patients mount a detectable antibody response in convalescent serum. With this change, the number of SARS cases in the United States decreased by half: from 344 suspect and 74 probable cases reported on July 15 to 175 suspect cases and 36 probable cases as of July 21. Exclusion of these SARS CoV-negative cases provides a more accurate indication of the magnitude of the epidemic in the United States.

A Global Response

Since late February, CDC has provided assistance to WHO in the investigation of and response to this multi-country outbreak. SARS presents a major challenge, but it also serves as an excellent illustration of the intense spirit of collaboration among the global clinical, scientific, and public health communities to combat a global epidemic.

Significant accomplishments to minimize the spread of SARS, including identification of the causative agent, were made in record time. Coordination of international assistance and national responses by WHO provided an opportunity for the United States and

¹ On July 18, 2003, CDC revised the laboratory criteria in the SARS case definition to require that convalescent serum be collected >28 days after symptom onset, instead of >21 days after symptom onset.

other countries to participate in international field teams and teleconferences and to share laboratory findings through the WHO secure laboratory website.

Domestically, CDC's response to the outbreak was coordinated through the new Director's Operations Center, which facilitated widespread participation by diverse individuals throughout the agency. Topic-specific response teams were formed to enable 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. Now that reporting of new cases has slowed, CDC and these 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.

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, or persistent infection in humans. 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. Whether or not SARS returns, there will be a need to have in place a system to

quickly detect an introduction into the United States on the one hand, while considering the importance of not causing 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 for public health, surveillance and response coordination, clinical management and diagnosis, reducing transmission in health-care settings, laboratory and environmental issues, and zoonotic disease research. CDC will play an important role in addressing these recommendations and will also assist 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 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, Singapore, China, Taiwan, and elsewhere. We are developing an after-action plan to assess priority areas for future action. We have established a SARS preparedness task force that includes the following teams: clinical; surveillance; laboratory; special studies; information technology; communication and education; and response and preparedness for community, public health, and healthcare systems. These teams 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. I will describe in additional detail some of the major issues that the preparedness plan will address and that are particularly germane to the topic of today's hearing.

Infection Control Measures

Transmission of the SARS coronavirus (SARS CoV) in healthcare settings was a major factor in the spread of disease during the global SARS epidemic earlier this year. In those areas where extensive outbreaks occurred, early SARS transmission occurred predominantly within healthcare facilities among healthcare workers, patients, and visitors. For example, 77% of patients identified in the first phase of the outbreak in Toronto acquired SARS in the healthcare setting. The impact of healthcare-associated transmission was magnified by the fact that hospitalized patients, because of their high prevalence of underlying diseases, appeared to be more susceptible to severe illness and death following infection with SARS CoV. In addition, secondary transmission from infected healthcare workers to their close contacts was common, and appears to have contributed to community spread in some countries.

Beginning early in the course of the SARS outbreak, CDC rapidly developed, disseminated, and updated numerous infection control documents providing guidance for preventing SARS CoV transmission in healthcare facilities and other settings. These documents were based on knowledge gained through the clinical, epidemiologic, and laboratory investigations performed by CDC staff and public health and clinical collaborators both in the U.S. and in SARS-affected areas around the world. In addition, expert clinical and infection control consultation, utilizing the Healthcare

Infection Control Practices Advisory Committee, was sought and input incorporated into each document. These guidance documents were updated frequently as new information became available. The information was disseminated through several channels of communication, including CDC's website, *Epi-X* communications, Health Alert Notices, rapid publications in the *Morbidity and Mortality Weekly Report*, press conferences, webcasts targeted toward clinicians and public health officials, regular telephone conferences with clinician groups and state and local health departments, and regular communication and collaborative work with WHO and other governmental health agencies.

Although CDC's infection control guidance served the needs of the United States healthcare system well during the course of the outbreak, the United States was fortunate in having only a very limited number of cases and no significant clusters of person-to-person transmission domestically. Our infection control guidance must be comprehensive and address the possibility of more extensive domestic transmission of SARS CoV in the future.

To this end, the contingency plan will provide guidance for the healthcare system and for state and local health agencies that will allow for a varying intensity of response based upon the level of SARS CoV activity within an individual healthcare facility and within the surrounding community. In the absence of any recognized SARS activity, the recommendations will include specific preparedness measures that will allow healthcare facilities to respond rapidly should SARS recur. As the incidence and risk of SARS increases, the level of infection control response will be graded to ensure that vigorous containment measures are effectively instituted. Clearly, SARS containment measures within healthcare facilities interface with community containment measures. The

preparedness plan will fully integrate healthcare-based infection control and community-based prevention and containment strategies, including isolation and quarantine, as needed. Experience with the recent epidemic indicates that these measures are effective in controlling transmission when they are implemented aggressively.

Laboratory

Throughout the response to SARS, CDC laboratory scientists have collaborated closely with colleagues from laboratories in Asia, Europe, and elsewhere to share findings so that they can all learn from each other's work. They have exchanged reagents and sharing specimens and tissues to conduct additional testing. In April 2003—one month into the international SARS response—CDC announced that our laboratorians had sequenced the genome for the coronavirus believed to be the cause of SARS. These results and those from other laboratories confirmed that the SARS coronavirus is a previously unrecognized virus and furthered efforts to develop new and rapid diagnostic tests, antiviral agents and vaccines. These discoveries reflect significant and unprecedented achievements in science, technology, and international collaboration.

CDC will build on these achievements and collaborations, as diagnosis both of SARS and of infections with other respiratory pathogens will be critical to efficiently and rapidly identify introductions of SARS while minimizing unnecessary concerns and social and work disruptions. CDC is refining our existing SARS diagnostics and working with commercial, academic and federal partners to develop better, rapid, and reliable diagnostics. This is particularly crucial to be able to confirm SARS and rapidly rule out other causes of illness. We have also provided diagnostics to public health laboratories and are cooperating with private industry as they develop diagnostics that would be available on a wider scale. Finally, we are characterizing SARS isolates to monitor

changes in the virus that may be associated with alterations in the clinical and epidemiologic features of the virus and that can help monitor transmission patterns.

Containment Measures

CDC routinely works with federal agencies, state and local health departments, travel industry and other organizations to prevent the introduction of communicable diseases into the United States. We are responsible for providing guidance on responses at U.S. borders, including issuance of travel alerts and advisories, distribution of health alert notices, response to arriving ill travelers, notification and follow-up of potentially exposed passengers on public conveyances, and arrival and departure restrictions on travelers. CDC has eight fully staffed quarantine stations in the United States. Quarantine inspectors serve as important guardians of health at borders and ports of entry into the United States, routinely responding to illness in arriving passengers and ensuring that the appropriate medical or procedural action is taken. During the investigation of and response to the SARS outbreak, CDC, in collaboration with the Department of Homeland Security's Bureau of Customs and Border Protection (BCBP), issued travel advisories to airline passengers traveling to SARS-affected areas and distributed over 2½ million health alert notice cards to airline passengers on over 11,000 flights arriving in the United States from these areas.

As part of CDC's preparedness planning process, state and local public health officials will be provided guidance on the implementation of containment measures in the event of a resurgence of SARS. These will address isolation of cases, tracing and monitoring of contacts, and implementation of individual and community-based quarantine measures. To enhance quarantine stations' capacities, CDC is contracting for field staff assistance to be assigned to the eight Quarantine Stations and their subports. The

guidance will also address essential preparedness activities for isolation and quarantine, including legal authorities, personnel and facility requirements, enforcement plans, and coordination with public and private partners.

In preparation for a potential reemergence of SARS globally and in the United States, CDC is (1) developing a database of emergency contact information for our public health partners, other government agencies, and industry constituents, such as airlines and cruise lines; (2) expanding our list of memoranda of agreement with local healthcare facilities where travelers suspected of having quarantinable diseases can be evaluated and isolated; and (3) collaborating with industry partners to develop mechanisms for obtaining locating information so that travelers who might be infected or exposed to SARS can be notified, isolated, or quarantined promptly.

Communications

Rapid and accurate communications are crucial to ensure a prompt and coordinated response to any infectious disease outbreak. Thus, strengthening linkages and 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 recognizes the necessity of an informed public in reaching our public health goals, and we continue to expand its communications mission accordingly. During the recent SARS outbreak we consciously broadened our media relations to include a series of scheduled news conferences. These media events expanded upon our established teleconference format to accommodate both distant and on-site media representatives, including the capability for live telecasts. This model proved highly effective and will

likely be employed in any future SARS outbreak. Through CDC's Emergency Communications System, we have the capacity to expand rapidly and efficiently our communications outreach beyond the news media. ECS teams provide tailored, consistent messages to specific constituencies, including state and local public health partners, clinicians groups, and affected communities.

We are also strengthening the communications channels with our international partners, including WHO, which benefits Americans and the global community in that it reduces confusion among travelers and helps people assess personal risk from SARS. Additionally, optimal international communication demonstrates the essential level of collaboration so vital to minimizing the spread of disease and developing the tools to identify, treat, and ultimately prevent it.

Public Health Research

Despite the successes of the SARS response thus far, many questions about the virus and the illness remain unanswered, and much remains to be done. CDC is committed to continuing to help build the scientific base that will ensure that the global public health community is adequately prepared to meet the challenges of SARS and is expanding its SARS research program. This expanded program will complement research supported by the National Institutes of Health (NIH) and help develop the strategies and tools needed to quickly report cases and track global transmission of the virus; interrupt transmission and treat or prevent disease; rapidly detect infection and monitor evolution of the virus; better understand the natural history of SARS to develop more effective prevention and treatment strategies; and adequately and promptly inform public health officials, clinicians and other healthcare workers, policy makers, and the public about SARS and guide appropriate responses to the outbreak.

CDC's research program will also take advantage of ongoing collaborations and cooperation with its partners in other federal agencies, academic institutions, and private industry, providing a bridge between basic science research and public health programs. A broad-based and well coordinated research program is essential for quickly and efficiently controlling SARS and mitigating its global impact. The proposed research agenda will also strengthen the infrastructure and linkages needed to effectively respond to other emerging or reemerging global microbial threats, such as pandemic influenza.

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.

In March, 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 states 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. Summaries of the new report have been provided to the Subcommittee.

Conclusion

The SARS experience reinforces the importance of 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 develops, disseminates, and implements plans to strengthen the nation's public health capacity to respond to SARS in the future, 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. 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.