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Testimony

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and Investigations, Committee on Energy  
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## SARS OUTBREAK

# Improvements to Public Health Capacity Are Needed for Responding to Bioterrorism and Emerging Infectious Diseases

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Highlights of [GAO-03-769T](#), testimony before the Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives

## Why GAO Did This Study

SARS has infected relatively few people nationwide, but it has raised concerns about preparedness for large-scale infectious disease outbreaks. The initial response to an outbreak occurs in local agencies and hospitals, with support from state and federal agencies, and can involve disease surveillance, epidemiologic investigation, health care delivery, and quarantine management. Officials have learned lessons applicable to preparedness for such outbreaks from experiences with other major public health threats.

GAO was asked to examine the preparedness of state and local public health agencies and hospitals for responding to a large-scale infectious disease outbreak and the relationship of federal and state planning for an influenza pandemic to preparedness for emerging infectious diseases.

This testimony is based on *Bioterrorism: Preparedness Varied across State and Local Jurisdictions*, [GAO-03-373](#) (Apr. 7, 2003); findings from a GAO survey on hospital emergency room capacity (in *Hospital Emergency Departments: Crowded Conditions Vary among Hospitals and Communities*, [GAO-03-460](#) (Mar. 14, 2003)) and on hospital emergency preparedness; and information updating *Influenza Pandemic: Plan Needed for Federal and State Response*, [GAO-01-4](#) (Oct. 27, 2000).

[www.gao.gov/cgi-bin/getrpt?GAO-03-769T](http://www.gao.gov/cgi-bin/getrpt?GAO-03-769T).

To view the full testimony, including the scope and methodology, click on the link above. For more information, contact Janet Heinrich at (202) 512-7119.

## SARS OUTBREAK

# Improvements to Public Health Capacity Are Needed for Responding to Bioterrorism and Emerging Infectious Diseases

## What GAO Found

The efforts of public health agencies and health care organizations to increase their preparedness for major public health threats such as bioterrorism and the worldwide influenza outbreaks known as pandemics have improved the nation's capacity to respond to SARS and other emerging infectious disease outbreaks, but gaps in preparedness remain. Specifically, GAO found that there are gaps in disease surveillance systems and laboratory facilities and that there are workforce shortages. The level of preparedness varied across seven cities GAO visited, with jurisdictions that have had multiple prior experiences with public health emergencies being generally more prepared than others. GAO found that planning for regional coordination was lacking between states. GAO also found that states were developing plans for receiving and distributing medical supplies for emergencies and for mass vaccinations in the event of a public health emergency.

GAO found that most hospitals lack the capacity to respond to large-scale infectious disease outbreaks. Most emergency departments have experienced some degree of crowding and therefore in some cases may not be able to handle a large influx of patients during a potential SARS or other infectious disease outbreak. Most hospitals across the country reported participating in basic planning activities for such outbreaks. However, few hospitals have adequate medical equipment, such as the ventilators that are often needed for respiratory infections such as SARS, to handle the large increases in the number of patients that may result.

The public health response to outbreaks of emerging infectious diseases such as SARS could be improved by the completion of federal and state influenza pandemic response plans that address problems related to the purchase, distribution, and administration of supplies of vaccines and antiviral drugs during an outbreak. The Centers for Disease Control and Prevention has provided interim draft guidance to facilitate state plans but has not made the final decisions on plan provisions necessary to mitigate the effects of potential shortages of vaccines and antiviral drugs in the event of an influenza pandemic.

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Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to be here today to discuss the work we have done pertaining to the nation's preparedness to manage major public health threats, such as the emerging infectious disease known as SARS.<sup>1</sup> The initial response to an outbreak of infectious disease would occur at the local level, with support from state and federal agencies, and could involve disease surveillance,<sup>2</sup> epidemiologic investigation,<sup>3</sup> health care delivery, and quarantine management. The SARS outbreak has not infected large numbers of individuals in the United States, but it has raised concerns about the nation's preparedness to manage these components of response should it, or other infections, reach large-scale proportions.

Public health officials and health care workers have learned lessons applicable to preparedness for large-scale infectious disease outbreaks from experiences with other major public health threats. Because of prior worldwide influenza outbreaks—known as pandemics<sup>4</sup>—federal and state agencies have begun to focus special attention on planning for such events. Similarly, following the anthrax incidents of fall 2001, the Congress expressed concern that the nation may not be prepared to respond to a large-scale bioterrorist event. State and local response agencies and organizations have recognized the need to strengthen their infrastructure and capacity to respond to bioterrorism. The improvements they are making will also strengthen their ability to identify and respond to other major public health threats, including naturally occurring infectious disease outbreaks. Planning for a response to bioterrorism and influenza pandemics targets the public health resources essential for a response to emerging infectious diseases.

To assist the Subcommittee in its consideration of our nation's capacity to respond to a major public health threat such as SARS, my remarks today

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<sup>1</sup>SARS is the abbreviation for severe acute respiratory syndrome.

<sup>2</sup>Disease surveillance uses systems that provide for the ongoing collection, analysis, and dissemination of health-related data to identify, prevent, and control disease.

<sup>3</sup>An epidemiologic investigation seeks to determine how a disease is distributed in a population and the factors that influence or determine this distribution.

<sup>4</sup>Influenza pandemics are worldwide influenza epidemics that can have successive "waves" of disease and last for up to 3 years. Three pandemics occurred in the twentieth century: the "Spanish flu" of 1918, which killed at least 20 million people worldwide; the "Asian flu" of 1957; and the "Hong Kong flu" of 1968.

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will focus on (1) the preparedness of state and local public health agencies for responding to a large-scale infectious disease outbreak, (2) the preparedness of hospitals for responding to a large-scale infectious disease outbreak, and (3) the relationship of federal and state planning for an influenza pandemic to preparedness for emerging infectious diseases.

My testimony today is based largely on our recently released report on state and local preparedness for a bioterrorist attack.<sup>5</sup> For that report, we conducted site visits to seven cities and their respective state governments. We also reviewed each state's spring 2002 applications for bioterrorism preparedness funding distributed by the Department of Health and Human Services' (HHS) Centers for Disease Control and Prevention (CDC) and Health Resources and Services Administration (HRSA), and each state's fall 2002 progress report on the use of that funding. In addition, I will present some findings from a survey we conducted on hospital emergency department capacity and emergency preparedness,<sup>6</sup> as well as some information updating our 2000 report on federal and state planning for an influenza pandemic.<sup>7</sup>

In summary, while the efforts of public health agencies and health care organizations to increase their preparedness for major public health threats such as influenza pandemics and bioterrorism have improved the nation's capacity to respond to SARS and other emerging infectious disease outbreaks, gaps in preparedness remain. Specifically, we found that there are gaps in disease surveillance systems and laboratory facilities and that there are workforce shortages. The level of preparedness varied across cities we visited, with jurisdictions that have had multiple prior experiences with public health emergencies being generally more prepared than others. We found that planning for regional coordination was lacking between states. We also found that states were developing

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<sup>5</sup>U.S. General Accounting Office, *Bioterrorism: Preparedness Varied across State and Local Jurisdictions*, [GAO-03-373](#) (Washington, D.C.: Apr. 7, 2003).

<sup>6</sup>These findings include those related to emergency department capacity, which we reported in U.S. General Accounting Office, *Hospital Emergency Departments: Crowded Conditions Vary among Hospitals and Communities*, [GAO-03-460](#) (Washington, D.C.: Mar. 14, 2003) and hospital emergency preparedness for mass casualty incidents from ongoing work. We did our work on the survey from May 2002 through May 2003 in accordance with generally accepted government auditing standards.

<sup>7</sup>U.S. General Accounting Office, *Influenza Pandemic: Plan Needed for Federal and State Response*, [GAO-01-4](#) (Washington, D.C.: Oct. 27, 2000).

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plans for receiving and distributing medical supplies for emergencies and for mass vaccinations in the event of a public health emergency.

We found that most hospitals across the country lack the capacity to respond to large-scale infectious disease outbreaks. Most emergency departments have experienced some degree of crowding and therefore in some cases may not be able to handle a large influx of patients during a potential SARS or other infectious disease outbreak. Although most hospitals report participating in basic planning activities for such outbreaks, few have adequate medical equipment, such as ventilators that are often needed for respiratory infections such as SARS, to handle the large increases in the number of patients that may result.

The public health response to outbreaks of emerging infectious diseases such as SARS could be improved by the completion of federal and state influenza pandemic response plans that address problems related to the purchase, distribution, and administration of supplies of vaccines and antiviral drugs during an outbreak. CDC has provided interim draft guidance to facilitate state plans but has not made the final decisions on plan provisions necessary to mitigate the effects of potential shortages of vaccines and antiviral drugs in the event of an influenza pandemic.

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## Background

SARS is a respiratory illness that has recently been reported principally in Asia, Europe, and North America. The World Health Organization reported on May 5, 2003, that there were an estimated 6,583 probable cases reported in 27 countries, including 61 cases in the United States. There have been 461 deaths worldwide, none of which have been in the United States. Of the 56 probable cases in the United States reported through April 30, 2003, 37 (66 percent) were hospitalized, and 2 (4 percent) required mechanical ventilation. Symptoms of the disease, which may be caused by a previously unrecognized coronavirus,<sup>8</sup> can include a fever, chills, headache, other body aches, or a dry cough.

A Canadian official recently reported that more than 60 percent of probable SARS cases in Canada, where the bulk of North American cases have occurred, resulted from transmission to health care workers and

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<sup>8</sup>The coronavirus is one of a group of viruses that are responsible for some but not all common colds. They are so named because their microscopic appearance is that of a virus particle surrounded by a crown.

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patients. Canada's experience with managing the SARS outbreak has shown that measures used to prevent and control emerging infectious diseases appear to have been useful in controlling this outbreak. One of the measures that it has undertaken to control the outbreak is isolating probable cases in hospitals, including closing two hospitals to new admissions.<sup>9</sup> Other measures include isolating people, either in their homes or in a hospital, who have had close contact with a SARS patient and providing educational materials regarding SARS to people who have traveled to locations of concern.

In order to be adequately prepared for a major public health threat such as SARS in the United States, state and local public health agencies need to have several basic capabilities, whether they possess them directly or have access to them through regional agreements. Public health departments need to have disease surveillance systems and epidemiologists to detect clusters of suspicious symptoms or diseases in order to facilitate early detection of disease and treatment of victims. Laboratories need to have adequate capacity and necessary staff to test clinical and environmental samples in order to identify an agent promptly so that proper treatment can be started and infectious diseases prevented from spreading. All organizations involved in the response must be able to communicate easily with one another as events unfold and critical information is acquired, especially in a large-scale infectious disease outbreak. In addition, plans that describe how state and local officials would manage and coordinate an emergency response need to be in place and to have been tested in an exercise, both at the state and local levels and at the regional level.

Local health care organizations, including hospitals, are generally responsible for the initial response to a public health emergency. In the event of a large-scale infectious disease outbreak, hospitals and their emergency departments would be on the front line, and their personnel would take on the role of first responders. Because hospital emergency departments are open 24 hours a day, 7 days a week, exposed individuals would be likely to seek treatment from the medical staff on duty. Staff would need to be able to recognize and report any illness patterns or diagnostic clues that might indicate an unusual infectious disease outbreak to their state or local health department. Hospitals would need to have the capacity and staff necessary to treat severely ill patients and limit the spread of infectious disease. In addition, hospitals would need

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<sup>9</sup>The two hospitals have since been reopened.

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adequate stores of equipment and supplies, including medications, personal protective equipment, quarantine and isolation facilities, and air handling and filtration equipment.

The federal government also has a role in preparedness for and response to major public health threats. It becomes involved in investigating the cause of the disease, as it is doing with SARS. In addition, the federal government provides funding and resources to state and local entities to support preparedness and response efforts. CDC's Public Health Preparedness and Response for Bioterrorism program provided funding through cooperative agreements in fiscal year 2002 totaling \$918 million to states and municipalities to improve bioterrorism preparedness and response, as well as other public health emergency preparedness activities. HRSA's Bioterrorism Hospital Preparedness Program provided funding through cooperative agreements in fiscal year 2002 of approximately \$125 million to states and municipalities to enhance the capacity of hospitals and associated health care entities to respond to bioterrorist attacks. In March 2003, HHS announced that the CDC and HRSA programs would provide funding of approximately \$870 million and \$498 million, respectively, for fiscal year 2003. Among the other public health emergency response resources that the federal government provides is the Strategic National Stockpile, which contains pharmaceuticals, antidotes, and medical supplies that can be delivered anywhere in the United States within 12 hours of the decision to deploy.

Just as was true with the identification of the coronavirus as the likely causative agent in SARS, deciding which influenza viral strains are dominant depends on data collected from domestic and international surveillance systems that identify prevalent strains and characterize their effect on human health.<sup>10</sup> Antiviral drugs and vaccines against influenza are expected to be in short supply if a pandemic occurs. Antiviral drugs, which can be used against all forms of viral diseases, have been as effective as vaccines in preventing illness from influenza and have the advantage of being available now. HHS assumes shortages of antiviral drugs and vaccines will occur in a pandemic because demand is expected to exceed current rates of production. For example, increasing production capacity of antiviral drugs can take at least 6 to 9 months, according to manufacturers.

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<sup>10</sup>CDC participates in international disease and laboratory surveillance sponsored by the World Health Organization, which operates in 83 countries.

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## State and Local Officials Reported Varying Levels of Public Health Preparedness for Infectious Disease Outbreaks

In the cities we visited, state and local officials reported varying levels of public health preparedness to respond to outbreaks of diseases such as SARS. They recognized gaps in preparedness elements such as communication and were beginning to address them. Gaps also remained in other preparedness elements that have been more difficult to address, including the disease surveillance and laboratory systems and the response capacity of the workforce. In addition, we found that the level of preparedness varied across the cities. Jurisdictions that had multiple prior experiences with public health emergencies were generally more prepared than those with little or no such experience prior to our site visits. We found that planning for regional coordination was lacking between states. In addition, states were working on plans for receiving and distributing the Strategic National Stockpile and for administering mass vaccinations.

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## Progress Has Been Made in Elements of Public Health Preparedness, But Gaps Remain

States and local areas were addressing gaps in public health preparedness elements, such as communication, but weaknesses remained in other preparedness elements, including the disease surveillance and laboratory systems and the response capacity of the workforce. Gaps in capacity often are not amenable to solution in the short term because either they require additional resources or the solution takes time to implement.

### Communication

We found that officials were beginning to address communication problems. For example, six of the seven cities we visited were examining how communication would take place in a public health emergency. Many cities had purchased communication systems that allow officials from different organizations to communicate with one another in real time. In addition, state and local health agencies were working with CDC to build the Health Alert Network (HAN), an information and communication system. The nationwide HAN program has provided funding to establish infrastructure at the local level to improve the collection and transmission of information related to public health preparedness. Goals of the HAN program include providing high-speed Internet connectivity, broadcast capacity for emergency communication, and distance-learning infrastructure for training.

### Surveillance Systems and Laboratory Facilities

State and local officials for the cities we visited recognized and were attempting to address inadequacies in their surveillance systems and laboratory facilities. Local officials were concerned that their surveillance systems were inadequate to detect a bioterrorist event, and all of the states



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we visited were making efforts to improve their disease surveillance systems. Six of the cities we visited used a passive surveillance system<sup>11</sup> to detect infectious disease outbreaks.<sup>12</sup> However, passive systems may be inadequate to identify a rapidly spreading outbreak in its earliest and most manageable stage because, as officials in three states noted, there is chronic underreporting and a time lag between diagnosis of a condition and the health department's receipt of the report. To improve disease surveillance, six of the states and two of the cities we visited were developing surveillance systems using electronic databases. Several cities were also evaluating the use of nontraditional data sources, such as pharmacy sales, to conduct surveillance.<sup>13</sup> Three of the cities we visited were attempting to improve their surveillance capabilities by incorporating active surveillance components into their systems.

However, work to improve surveillance systems has proved challenging. For example, despite initiatives to develop active surveillance systems, the officials in one city considered event detection to be a weakness in their system, in part because they did not have authority to access hospital information systems. In addition, various local public health officials in other cities reported that they lacked the resources to sustain active surveillance.

Officials from all of the states we visited reported problems with their public health laboratory systems and said that they needed to be upgraded. All states were planning to purchase the equipment necessary

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<sup>11</sup>Passive surveillance systems rely on laboratory and hospital staff, physicians, and other relevant sources to take the initiative to provide data on illnesses to the health department, where officials analyze and interpret the information as it arrives. In contrast, in an active disease surveillance system, public health officials contact sources, such as laboratories, hospitals, and physicians, to obtain information on conditions or diseases in order to identify cases. Active surveillance can provide more complete detection of disease patterns than a system that is wholly dependent on voluntary reporting.

<sup>12</sup>Officials in one city told us that although it had no local disease surveillance, its state maintained a passive disease surveillance system.

<sup>13</sup>This type of active surveillance system in which the public health department obtains information from such sources as hospitals and pharmacies and conducts ongoing analysis of the data to search for certain combinations of signs and symptoms, is sometimes referred to as a syndromic surveillance system. One federal official has stated that research examining the usefulness of syndromic surveillance needs to continue. See S. Lillibridge, *Disease Surveillance, Bioterrorism, and Homeland Security*, Conference Summary and Proceedings Prepared by the Annapolis Center for Science-Based Public Policy (Annapolis, Md.: U.S. Medicine Institute for Health Studies, Dec. 4, 2001).

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for rapidly identifying a biological agent. State and local officials in most of the areas that we visited told us that the public health laboratory systems in their states were stressed, in some cases severely, by the sudden and significant increases in workload during the anthrax incidents in the fall of 2001. During these incidents, the demand for laboratory testing was significant even in states where no anthrax was found and affected the ability of the laboratories to perform their routine public health functions. Following the incidents, over 70,000 suspected anthrax samples were tested in laboratories across the country.

Officials in the states we visited were working on other solutions to their laboratory problems. States were examining various ways to manage peak loads, including entering into agreements with other states to provide surge capacity, incorporating clinical laboratories into cooperative laboratory systems, and purchasing new equipment. One state was working to alleviate its laboratory problems by upgrading two local public health laboratories to enable them to process samples of more dangerous pathogens and by establishing agreements with other states to provide backup capacity. Another state reported that it was using the funding from CDC to increase the number of pathogens the state laboratory could diagnose. The state also reported that it has worked to identify laboratories in adjacent states that are capable of being reached within 3 hours over surface roads. In addition, all of the states reported that their laboratory response plans had been revised to cover reporting and sharing laboratory results with local public health and law enforcement agencies.

## Workforce

At the time of our site visits, shortages in personnel existed in state and local public health departments and laboratories and were difficult to remedy. Officials from state and local health departments told us that staffing shortages were a major concern. Two of the states and cities that we visited were particularly concerned that they did not have enough epidemiologists to do the appropriate investigations in an emergency. One state department of public health we visited had lost approximately one-third of its staff because of budget cuts over the past decade. This department had been attempting to hire more epidemiologists. Barriers to finding and hiring epidemiologists included noncompetitive salaries and a general shortage of people with the necessary skills.

Shortages in laboratory personnel were also cited. Officials in one city noted that they had difficulty filling and maintaining laboratory positions. People that accepted the positions often left the health department for better-paying positions. Increased funding for hiring staff cannot necessarily solve these shortages in the near term because for many types

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of laboratory positions there are not enough trained individuals in the workforce. According to the Association of Public Health Laboratories, training laboratory personnel to provide them with the necessary skills will take time and require a strategy for building the needed workforce.<sup>14</sup>

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### Level of Preparedness Varied across Cities We Visited

We found that the overall level of public health preparedness varied by city. In the cities we visited, we observed that those cities that had recurring experience with public health emergencies, including those resulting from natural disasters, or with preparation for National Security Special Events, such as political conventions,<sup>15</sup> were generally more prepared than cities with little or no such experience. Cities that had dealt with multiple public health emergencies in the past might have been further along because they had learned which organizations and officials need to be involved in preparedness and response efforts and moved to include all pertinent parties in the efforts. Experience with natural disasters raised the awareness of local officials regarding the level of public health emergency preparedness in their cities and the kinds of preparedness problems they needed to address.

Even the cities that were better prepared were not strong in all elements. For example, one city reported that communications had been effective during public health emergencies and that the city had an active disease surveillance system. However, officials reported gaps in laboratory capacity. Another one of the better-prepared cities was connected to HAN and the Epidemic Information Exchange (Epi-X),<sup>16</sup> and all county emergency management agencies in the state were linked. However, the state did not have written agreements with its neighboring states for responding to a public health emergency.

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<sup>14</sup>Association of Public Health Laboratories, "State Public Health Laboratory Bioterrorism Capacity," *Public Health Laboratory Issues in Brief: Bioterrorism Capacity* (Washington, D.C.: October 2002).

<sup>15</sup>Presidential Decision Directive 62 created a category of special events called National Security Special Events, which are events of such significance that they warrant greater federal planning and protection than other special events. In addition to major political party conventions, such events include presidential inaugurations.

<sup>16</sup>Epi-X is a secure, Web-based exchange for public health officials to rapidly exchange information on disease outbreaks, exposures to environmental hazards, and other health events as they are identified and investigated.

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## Planning for Regional Coordination Was Lacking between States

Response organization officials were concerned about a lack of planning for regional coordination between states of the public health response to an infectious disease outbreak. As called for by the guidance for the CDC and HRSA funding, all of the states we visited organized their planning on the basis of regions within their states, assigning local areas to particular regions for planning purposes. A concern for response organization officials was the lack of planning for regional coordination between states. A hospital official in one city we visited said that state lines presented a “real wall” for planning purposes. Hospital officials in one state reported that they had no agreements with other states to share physicians. However, one local official reported that he had been discussing these issues and had drafted mutual aid agreements for hospitals and emergency medical services. Public health officials from several states reported developing working relationships with officials from other states to provide backup laboratory capacity.

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## States Have Begun Planning for Receiving and Distributing Items from the Strategic National Stockpile and for Administering Mass Vaccinations

States have begun planning for use of the Strategic National Stockpile.<sup>17</sup> To determine eligibility for the CDC funding, applicants were required to develop interim plans to receive and manage items from the stockpile, including mass distribution of antibiotics, vaccines, and medical materiel. However, having plans for the acceptance of the deliveries from the stockpile is not enough. Plans have to include details about dividing the materials that are delivered in large pallets and distributing the medications and vaccines.

Of the seven states we visited, five states had completed plans for the receipt and distribution of items from the stockpile. One state that was working on its plan stated that it would be completed in January 2003. Only one state had conducted exercises of its stockpile distribution plan, while the other states were planning to conduct exercises or drills of their plans sometime in 2003.

In addition, five states reported on their plans for mass vaccinations and seven states reported on their plans for large-scale administration of smallpox vaccine in response to an outbreak. Some states we visited had completed plans for mass vaccinations, whereas other states were still

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<sup>17</sup>HHS is planning to purchase approximately 2,700 ventilators by September 2003 to supplement those now available in the Strategic National Stockpile to enhance preparedness for a potential outbreak of SARS in the United States.

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developing their plans. The mass vaccination plans were generally closely tied to the plans for receiving and administering the stockpile. In addition, two states had completed smallpox response plans, which include plans for administering mass smallpox vaccinations to the general population, whereas four of the other states were drafting plans. The remaining state was discussing such a plan. However, only one of the states we visited has tested in an exercise its plan for conducting mass smallpox vaccinations.

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## Most Hospitals Lack Response Capacity for Large-Scale Infectious Disease Outbreaks

We found that most hospitals lack the capacity to respond to large-scale infectious disease outbreaks. Persons with symptoms of infectious disease would potentially go to emergency departments for treatment. Most emergency departments across the country have experienced some degree of crowding and therefore in some cases may not be able to handle a large influx of patients during a potential SARS outbreak. In addition, although most hospitals across the country reported participating in basic planning activities for large-scale infectious disease outbreaks, few have acquired the medical equipment resources, such as ventilators, to handle large increases in the number of patients that may result from outbreaks of diseases such as SARS.

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## Most Emergency Departments Have Experienced Some Degree of Crowding

Our survey found that most emergency departments have experienced some degree of overcrowding.<sup>18</sup> Persons with symptoms of infectious disease would potentially go to emergency departments for treatment, further stressing these facilities. The problem of overcrowding is much more pronounced in some hospitals and areas than in others. In general, hospitals that reported the most problems with crowding were in the largest metropolitan statistical areas (MSA) and in the MSAs with high population growth. For example, in fiscal year 2001, hospitals in MSAs with populations of 2.5 million or more had about 162 hours of diversion (an indicator of crowding),<sup>19</sup> compared with about 9 hours for hospitals in MSAs with populations of less than 1 million. Also the median number of hours of diversion in fiscal year 2001 for hospitals in MSAs with a high percentage population growth was about five times that for hospitals in MSAs with lower percentage population growth.

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<sup>18</sup>GAO-03-460.

<sup>19</sup>Diversions occur when hospitals request that en route ambulances bypass their emergency departments and transport patients that would have been otherwise taken to those emergency departments to other medical facilities.

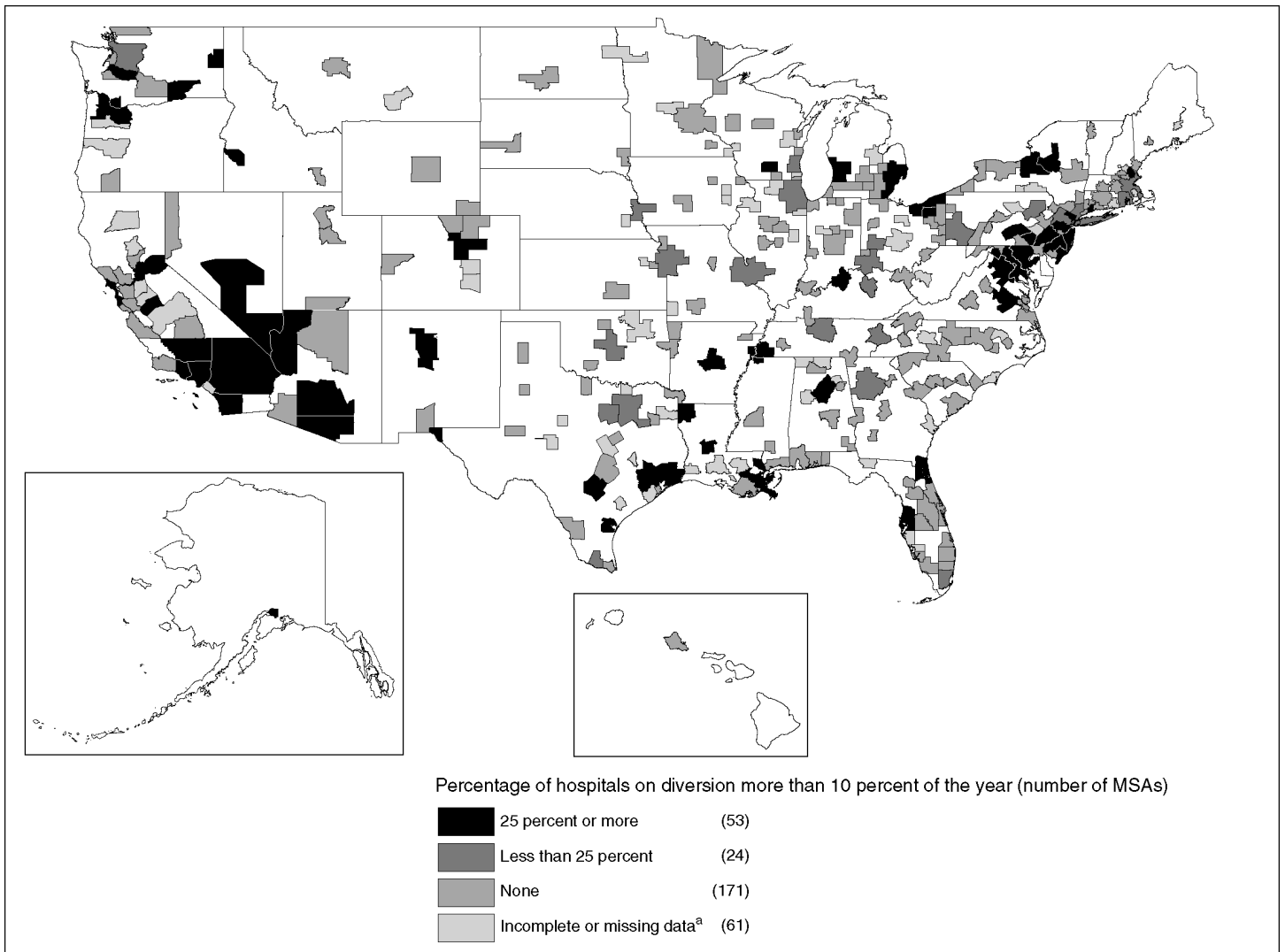
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Diversion varies greatly by MSA. Figure 1 shows each MSA and the share of hospitals within the MSA that reported being on diversion more than 10 percent of the time—or about 2.4 hours or more per day—in fiscal year 2001. Areas with the greatest diversion included Southern California and parts of the Northeast. Of the 248 MSAs for which data were available,<sup>20</sup> 171 (69 percent) had no hospitals reporting being on diversion more than 10 percent of the time. By contrast, 53 MSAs (21 percent) had at least one-quarter of responding hospitals on diversion for more than 10 percent of the time.

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<sup>20</sup>The 248 MSAs include those MSAs for which (1) more than half of hospitals in the MSA returned surveys and (2) more than half of those hospitals that returned surveys provided data on diversion hours.

**Figure 1: Percentage of Hospitals on Diversion More Than 10 Percent of the Time, by MSA, Fiscal Year 2001**



Source: GAO survey of hospitals, 2002.

Note: Percentage of hospitals reflects those hospitals that responded to the survey; responses were not weighted to represent all hospitals in the MSA.

<sup>a</sup>MSAs with a response rate of 50 percent or less or MSAs with 50 percent or more of data missing for responding hospitals. In 12 MSAs, no hospitals responded; these MSAs were excluded from the map.

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Hospitals in the largest MSAs and in MSAs with high population growth that have reported crowding in emergency departments may have difficulty handling a large influx of patients during a potential SARS outbreak, especially if this outbreak occurred in the winter months when the incidence of influenza is quite high. Thus far, the largest SARS outbreaks worldwide have primarily occurred in areas with dense populations.<sup>21</sup>

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### Most Hospitals Reported Planning and Training Efforts, but Fewer Than Half Have Participated in Drills or Exercises

At the time of our site visits, we found that hospitals were beginning to coordinate with other local response organizations and collaborate with each other in local planning efforts. Hospital officials in one city we visited told us that until September 11, 2001, hospitals were not seen as part of a response to a terrorist event but that city officials had come to realize that the first responders to a bioterrorism incident could be a hospital's medical staff. Officials from the state began to emphasize the need for a local approach to hospital preparedness. They said, however, that it was difficult to impress the importance of cooperation on hospitals because hospitals had not seen themselves as part of a local response system. The local government officials were asking them to create plans that integrated the city's hospitals and addressed such issues as off-site triage of patients and off-site acute care.

In our survey of over 2,000 hospitals,<sup>22</sup> 4 out of 5 hospitals reported having a written emergency response plan for large-scale infectious disease outbreaks. Of the hospitals with emergency response plans, most include a description of how to achieve surge capacity for obtaining additional pharmaceuticals, other supplies, and staff. In addition, almost all hospitals reported participating in community interagency disaster preparedness committees.

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<sup>21</sup>These areas include mainland China and the Hong Kong Special Administrative Region within the People's Republic of China; Singapore; Taiwan; and Toronto, Canada.

<sup>22</sup>Between May and September 2002, we surveyed over 2,000 short-term, nonfederal general medical and surgical hospitals with emergency departments located in metropolitan statistical areas. (See U.S. General Accounting Office, *Hospital Emergency Departments: Crowded Conditions Vary among Hospitals and Communities*, [GAO-03-460](#) (Washington, D.C.: Mar. 14, 2003) for information on the survey universe and development of the survey.) For the part of the survey that specifically addressed hospital preparedness for mass casualty incidents, we obtained responses from 1,482 hospitals for the third section of the survey addressing emergency preparedness, a response rate of about 73 percent.



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Our survey showed that hospitals have provided training to staff on biological agents, but fewer than half have participated in exercises related to bioterrorism. Most hospitals we surveyed reported providing training about identifying and diagnosing symptoms for the six biological agents identified by the CDC as most likely to be used in a bioterrorist attack. At least 90 percent of hospitals reported providing training for two of these agents—smallpox and anthrax—and approximately three-fourths of hospitals reported providing training about the other four—plague, botulism, tularemia, and hemorrhagic fever viruses.

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### Most Hospitals Lack Adequate Equipment, Facilities, and Staff Required to Respond to a Large-Scale Infectious Disease Outbreak

Most hospitals lack adequate equipment, isolation facilities, and staff to treat a large increase in the number of patients for an infectious disease such as SARS. To prevent transmission of SARS in health care settings, CDC recommends that health care workers use personal protective equipment, including gowns, gloves, respirators, and protective eyewear.<sup>23</sup> SARS patients in the United States are being isolated until they are no longer infectious. CDC estimates that patients require mechanical ventilation in 10 to 20 percent of SARS cases.<sup>24</sup>

In the seven cities we visited, hospital, state, and local officials reported that hospitals needed additional equipment and capital improvements—including medical stockpiles, personal protective equipment, quarantine and isolation facilities, and air handling and filtering equipment—to enhance preparedness. Five of the states we visited reported shortages of hospital medical staff, including nurses and physicians, necessary to increase response capacity in an emergency. One of the states we visited reported that only 11 percent of its hospitals could readily increase their capacity for treating patients with infectious diseases requiring isolation, such as smallpox and SARS. Another state reported that most of its hospitals have little or no capacity for isolating patients diagnosed with or being tested for infectious diseases.

According to our hospital survey, availability of medical equipment varied greatly between hospitals, and few hospitals seemed to have adequate

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<sup>23</sup>CDC, *Interim Domestic Guidance for Management of Exposures to Severe Acute Respiratory Syndrome (SARS) for Healthcare and Other Institutional Settings* (Apr. 12, 2003), <http://www.cdc.gov/ncidod/sars/exposureguidance.htm> (downloaded May 5, 2003).

<sup>24</sup>CDC, *Frequently Asked Questions: Severe Acute Respiratory Syndrome (SARS)*, <http://www.cdc.gov/ncidod/sars/faq.htm> (downloaded May 5, 2003).

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equipment and supplies to handle a large-scale infectious disease outbreak. While most hospitals had, for every 100 staffed beds, at least 1 ventilator, 1 personal protective equipment suit, or 1 isolation bed, half of the hospitals had, for every 100 staffed beds, fewer than 6 ventilators, 3 or fewer personal protective equipment suits, and fewer than 4 isolation beds.

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## Key Federal Decisions for Influenza Pandemic Planning Could Facilitate Response to Emerging Infectious Diseases

The completion of final federal influenza pandemic response plans that address the problems related to the purchase, distribution, and administration of supplies of vaccines and antiviral drugs during a pandemic could facilitate the public health response to emerging infectious disease outbreaks. CDC has provided interim draft guidance to facilitate state plans but has not made the final decisions on plan provisions necessary to mitigate the effects of potential shortages of vaccines and antiviral drugs. Until such decisions are made, the timeliness and adequacy of response efforts may be compromised.

In the most recent version of its pandemic influenza planning guidance for states, CDC lists several key federal decisions related to vaccines and antiviral drugs that have not been made. These decisions include determining the amount of vaccines and antiviral drugs that will be purchased at the federal level; the division of responsibility between the public and the private sectors for the purchase, distribution, and administration of vaccines and drugs; and how population groups will be prioritized and targeted to receive limited supplies of vaccines and drugs. In each of these areas, until federal decisions are made, states will not be able to develop strategies consistent with federal action.

The interim draft guidance for state pandemic plans says that resources can be expected to be available through federal contracts to purchase influenza vaccine and some antiviral agents, but some state funding may be required. The amounts of antiviral drugs to be purchased and stockpiled are yet to be determined, even though these drugs are available and can potentially be used for both treatment and prevention during a pandemic.

CDC has indicated in its interim draft guidance that the policies for purchasing, distributing, and administering vaccines and drugs by the private and public sectors will change during a pandemic, but some decisions necessary to prepare for these expected changes have not been made. During a typical annual influenza response, influenza vaccine and antiviral drug distribution is primarily handled directly by manufacturers

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through private vendors and pharmacies to health care providers. During a pandemic, however, CDC interim draft guidance indicates that many of these private-sector responsibilities may be transferred to the public sector at the federal, state, or local levels and that priority groups within the population would need to be established for receiving limited supplies of vaccines and drugs.

State officials are particularly concerned that a national plan has not been issued with final recommendations for how population groups should be prioritized to receive vaccines and antiviral drugs. In its interim draft guidance, CDC lists eight population groups that should be considered in establishing priorities among groups for receiving vaccines and drugs during a pandemic. The list includes such groups as health care workers and public health personnel involved in the pandemic response, persons traditionally considered to be at increased risk of severe influenza illness and mortality, and preschool and school-aged children.

Although state officials acknowledge the need for flexibility in planning because many aspects of a pandemic cannot be known in advance, the absence of more detail leaves them uncertain about how to plan for the use of limited supplies of vaccine and drugs. In our 2000 report on the influenza pandemic, we recommended that HHS determine the capability of the private and public sectors to produce, distribute, and administer vaccines and drugs and complete the national response plan.<sup>25</sup> To date, only limited progress has been made in addressing these recommendations.

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## Concluding Observations

Many actions taken at the state and local level to prepare for a bioterrorist event have enhanced the ability of state and local response agencies and organizations to manage an outbreak of an infectious disease such as SARS. However, there are significant gaps in public health surveillance systems and laboratory capacity, and the number of personnel trained for disease detection is insufficient. Most emergency departments across the country have experienced some degree of overcrowding. Hospitals have begun planning and training efforts to respond to large-scale infectious disease outbreaks, but many hospitals lack adequate equipment, medical stockpiles, personal protective equipment, and quarantine and isolation facilities. Federal and state plans for the purchase, distribution, and

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<sup>25</sup>GAO-01-4.

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administration of supplies of vaccines and drugs in response to an influenza pandemic have still not been finalized. The lack of these final plans has serious implications for efforts to mobilize the distribution of vaccines and drugs for other infectious disease outbreaks.

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Mr. Chairman, this completes my prepared statement. I would be happy to respond to any questions you or other Members of the Subcommittee may have at this time.

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## Contact and Staff Acknowledgments

For further information about this testimony, please contact me at (202) 512-7119. Robert Copeland, Marcia Crosse, Martin T. Gahart, Deborah Miller, Roseanne Price, and Ann Tynan also made key contributions to this statement.

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