Section 1: Public Health Preparedness in the States and DC

Section 1 presents data on disease detection and investigation, public health laboratories, and response. These essential activities support all nine CDC preparedness goals. Table 2 describes some of the key improvements compared to 2001.

Table 2: Progress in Public Health Preparedness, 2001-2007

	Then (2001)[1]	Now (2007)[2]
Disease Detection and Investigation	Some state public health departments did not have enough epidemiologists to investigate the suspected disease cases and had to borrow untrained staff from other programs.	The cooperative agreement supports additional staff in every state to monitor and investigate diseases and respond to emergencies. Other public health professionals have also been trained to provide support when preparedness staff are overwhelmed.
Laboratory Testing	Some state public health laboratories could not perform rapid tests for anthrax because they lacked equipment, supplies, or trained staff.	Every state has at least one public health laboratory that can perform rapid tests for anthrax and other bioterrorism agents, and 47 public health laboratories can test for a variety of chemical agents.
Response: Relationships with First Responders	State and local public health departments had not fully anticipated the extent of coordination needed among first responders.	Public health departments in every state have established relationships and conducted exercises with emergency management and other key players.
Response: Coordination	An ad-hoc center at CDC helped coordinate state and local response efforts.	Emergency operations centers are in place at CDC and almost all state public health departments to coordinate response activities, and roles and responsibilities are defined across multiple agencies and jurisdictions.
Response: Communication	Public health professionals did not have a system in place to communicate effectively with physicians during a crisis.	All state public health departments have systems to communicate rapidly with physicians and the public.
Response: Intervention	Major metropolitan areas did not have the ability to provide medicine to large portions of their population in the case of a bioterrorist event.	Major metropolitan areas are working to provide medicines to 100% of their population within 48 hours.

[1] Government Accountability Office, *Public Health Response to Anthrax Incidents of 2001* (GAO-04-152); 2003; [2] CDC data; 2007

Disease Detection and Investigation:

Improving the Public Health Workforce and Disease Surveillance

The sooner public health professionals can detect the source and spread of diseases or other health threats and investigate their effects in the community, the more quickly they can protect the public. Progress in disease detection and investigation supports CDC preparedness goals in the areas of prevention, detection and reporting, investigation, and recovery.

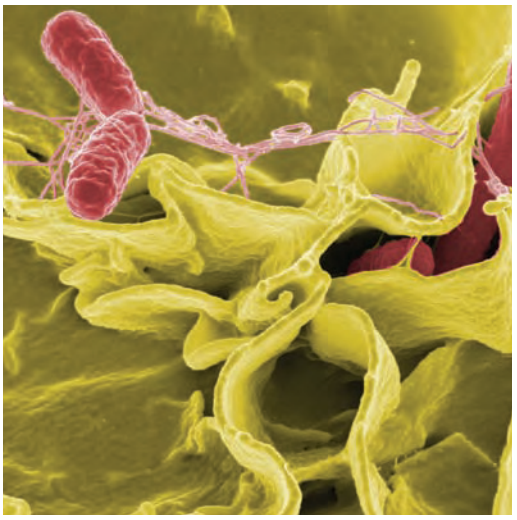
Using cooperative agreement funds, public health departments have improved their abilities to detect and investigate diseases by enhancing the public health workforce and disease surveillance systems.

Increased Workforce Capacity

In 2006, the cooperative agreement funded 531 epidemiologists. The majority of these epidemiologists specialized either in emergency response (291) or infectious diseases (199).[5]

A skilled public health workforce.
Epidemiologists, or "disease detectives," detect and investigate health threats and disease patterns. They might identify contaminated food causing illness, assess the number of people injured and types of injuries resulting from a disaster, or determine causes of a sudden onset of fever in a community. They also work to minimize the negative effects of a health threat in a community.

According to a 2006 CSTE survey, the total number of epidemiologists in state public health departments working in emergency response has doubled since 2001 (Table 3).



A connected public health workforce.
The increase in the users of the Epidemic Information Exchange *(Epi-X)*, a secure CDC-based communications system that helps track disease outbreaks, suggests that public health professionals are more connected (Table 3). *Epi-X* users represent state health departments (38%), local health departments (37%), CDC and other federal agencies (22%), and other organizations, such as poison control centers (3%).[6]

Through *Epi-X,* these users report outbreaks and other public health events to CDC and receive notifications about developing health threats through daily electronic summaries. When a report is of special importance, users receive immediate e-mails or emergency notification (i.e., pager, "land line" phone, or cell phone).

Enhancing disease surveillance systems.
Epidemiologists need health-related data to detect disease patterns, estimate effects, and determine the spread of illness. Surveillance—the ongoing and systematic collection, analysis, and interpretation of data—is critical to detect disease

Table 3: Public Health Workforce for Disease Detection and Investigation, 2001-2006

Indicator	Then (2001)	Now (2006)	Percent Increase
Epidemiologists in public health departments working in emergency response[1]	115	232	102%
Epi-X users[2]	890	4,646	422%

[1] CSTE, ECA; 2006 - data for 38 states and DC; [2] CDC *Epi-X* data; 2006

[5] CSTE, *Epidemiological Capacity Assessment* (ECA); 2006 – data for 50 states, DC, and 4 territories

[6] CDC, *Epi-X* data; 2007

outbreaks as early as possible and to ensure that public health professionals are aware of the number and geographic distribution of illness.

To help detect disease patterns, all state public health departments now can receive urgent disease reports 24/7/365 (Table 4). Previously, it was often difficult for clinicians to reach a public health professional after regular work hours.

In addition, CDC, state and local public health departments, and other partners are developing flexible and innovative surveillance systems for a wide range of emergencies, including disease outbreaks, bioterrorism, and natural disasters. In 2007, 44 states reported evaluating health data to detect unusual patterns that could be associated with health threats.[7]

The CDC Early Aberration Reporting System (EARS) is one surveillance system state and local health departments use to monitor notifiable diseases and detect unusual spikes indicating disease outbreaks. EARS tracks data from sources such as hospital emergency departments, 911 emergency calls, and school absenteeism. In 2007, EARS was used in approximately 100 state and local public health departments and international sites. It has been used during hurricane seasons and at several national events.[8]

Another surveillance system that CDC administers is BioSense, which provides local, state, and federal public health and healthcare organizations with access to the same data, at the same time. In other words, if an emergency occurs, every level of public health will be able to see healthcare data from their community in near real-time. This can decrease delays in recognition of a problem and enhance emergency response. As of November 2007, BioSense had 423 hospitals transmitting real-time data, covering 38 states and 71 major metropolitan areas. Over 1,500 federal military and veterans' outpatient facilities also transmitted data.[9]

In preparation for a possible influenza pandemic, states are also improving systems to monitor seasonal influenza. In 2006, 28 states reported conducting surveillance for seasonal influenza throughout the year, while in 2007, all states and DC reported doing so.[10, 11] Routine surveillance of influenza viruses can characterize circulating strains to help experts develop annual vaccines and identify strains with pandemic potential.

Challenges for Disease Detection and Investigation

Several challenges continue to hinder public health departments' ability to collect and effectively use information.

Shortages in the epidemiology workforce. Public health departments still face barriers in recruiting and retaining qualified epidemiologists. According to the 2006 CSTE survey, most state and local public health departments reported difficulty in hiring epidemiologists. Although the number of epidemiologists has increased since 2001, in 2006, state public health departments reported needing 34% more epidemiologists than they had to provide full capacity nationwide.[12]

Other public health professionals, such as information technology specialists, are also needed to support emerging data sharing and communication initiatives. The aging public health workforce, high retirement rates, barriers to recruitment and retention, and the need to train the existing workforce in new methods and technology are all issues needing continuous attention.

Table 4: Public Health Disease Reporting Systems, 50 States and DC, 1999-2005

Indicator	Then (1999)	Now (2005)	Percent Increase
Public health departments that can receive urgent disease reports 24/7/365	12[1]	51[2]	325%

[1] HHS, Office of the Inspector General (OIG), *Status of State 24/7 Urgent Disease and Public Health Emergency Reporting Systems;* published February 2005; 1999 data; [2]CDC, DSLR data; 2005

[7] CDC, DSLR Mid-Year Report Review data; 2007
[8] CDC, Division of Bioterrorism Preparedness and Response (DBPR) EARS data; 2007
[9] CDC, Division of Integrated Surveillance Systems and Services BioSense data; 2007
[10] CDC, Pandemic Influenza State Self-Assessments data; 2006 - data presented for 49 states
[11] HHS OIG, *Memorandum Report—Laboratory Preparedness for Pandemic Influenza*; published October 2007
[12] CSTE, *ECA*; 2006

Networking disease surveillance systems. During emergencies, public health professionals need to alert both clinicians and the public quickly. A unified network of surveillance systems from hospital organizations, physician practices, public health departments, and other data sources can provide public health professionals with the best available information to protect community health.

Although public health departments have made progress in disease surveillance, more work needs to be done to integrate these systems. In 2007, 16 states did not report any plans to electronically exchange health data with regional health information organizations (networks of healthcare provider organizations that allow the electronic sharing of health information among members).[13]

In addition, quickly sharing public health information across jurisdictions is important during emergencies, such as when displaced individuals need care out-of-state. Without ensuring an appropriate legal framework before a disaster occurs, states may be unable to provide critical public health information to other jurisdictions.

Epidemiologists and other public health professionals help protect population health after a chlorine spill.

South Carolina Public Health Effectively Responds to a Chlorine Spill

In January 2005, a freight train transporting chlorine and other chemicals collided with a parked train in downtown Graniteville, South Carolina. The rupture of one car released about 63 tons of liquid chlorine near residential and commercial districts. This accident caused nine deaths and forced at least 529 people to seek medical treatment. Local public health and emergency management officials investigated the damage. Since chlorine exposure was a serious public health threat, area residents were evacuated. Schools and businesses were closed.

Public health professionals coordinated emergency medical services, monitored hospital care, assessed the number of casualties, and supported disaster mortuary services. Through interviews and medical chart reviews, epidemiologists collected data on symptoms, exposures, and demographics. With this information, public health professionals could track and alleviate the long-term effects.

This accident was the worst chemical train wreck in the United States since 1978. Established response plans and partnerships helped South Carolina public health professionals respond quickly and effectively. The cooperative agreement helped fund activities that improved response. Because many nuclear and industrial facilities and rail lines were in the area, local public health and emergency management departments had taken an all-hazards approach to emergency response planning, with a focus on hazardous materials training. Coordination among agencies was also a priority.

Please refer to Section 2 for response examples for each state and directly funded locality.

[13] CDC, DSLR Mid-Year Progress Report Review data; 2007

Public Health Laboratories:

Improving Laboratory Testing for Biological and Chemical Threats, Communication, and Training

Public health laboratories are critical in identifying disease agents, toxins, and other health threats found in tissue, food, or other substances. They also play a large role in alerting others about emerging health threats, and training and supporting clinical laboratories. The cooperative agreement has funded public health laboratories to hire and train staff, and acquire equipment. This supports CDC preparedness goals in the areas of prevention, and detection and reporting.

Expanding testing. Public health laboratories have expanded their ability to perform rapid tests for biological and chemical agents. Previously, many state and local public health laboratories had to ship samples to CDC in Atlanta, Georgia, for testing.

Now, as shown in Table 5, identification of biological agents (e.g., anthrax or plague) and chemical agents is possible through the Laboratory Response Network (LRN). The LRN is a national network of local, state, and federal public health laboratories; military, international, agricultural, and veterinary diagnostic laboratories; and food and environmental testing laboratories.

Table 5: Laboratory Testing Capabilities, 2001-2007

Indicator	Then	Now (2007)	Percent Increase
State and local public health laboratories that can detect biological agents	83 (2002)	110	33%
Public health laboratories that can test for and/or handle toxic chemical agents:			
Level 1 laboratories*	0 (2001)	10	—
Level 2 laboratories	0 (2001)	37	—
Level 3 laboratories	0 (2001)	15	—

Source: CDC, DBPR LRN data; 2001-2007

* Level 1 laboratories serve as surge capacity laboratories for CDC and can test for an expanded number of chemical agents, including nerve agents, mustard agents, and toxic industrial chemicals. Level 2 laboratories are also surge capacity laboratories but can test for a more limited panel of agents. Level 3 laboratories work with hospitals and other first responders within their jurisdiction to maintain competency in clinical specimen collection, storage, and shipment.

Laboratory Response Network

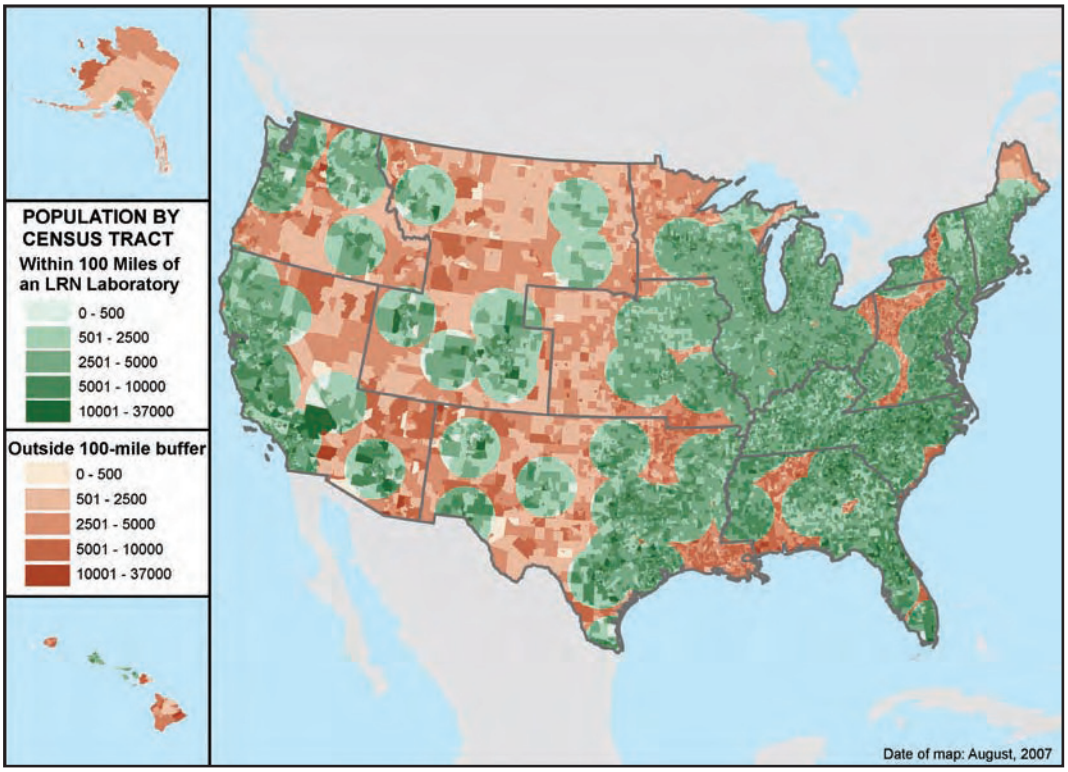
Some of the ways CDC supports LRN member laboratories include:

- Sharing tests used to confirm biological and chemical agents;
- Enabling secure communications on emerging and emergency issues;
- Developing training curricula;
- Implementing a quality assurance program; and
- Providing vaccines to protect laboratory workers from dangerous agents.

This network supports the laboratory facilities and trained staff to respond to biological and chemical terrorism and other public health emergencies. In 2007, the LRN had 163 member laboratories capable of detecting biological agents (of which 110 are state and local public health laboratories). In addition, 62 LRN laboratories can test for and/or handle chemical agents. As shown in Figure 3, 90% of the U.S. population lived within 100 miles of a LRN laboratory in 2007.[14]

Improving communication among laboratories. Once a threat is confirmed in one laboratory, other laboratories need to be quickly alerted since they might receive related case samples (indicating that the threat is spreading). To enable this communication, CDC manages a secure communication system among LRN member laboratories. In addition, public health laboratories need to communicate with the thousands of clinical and commercial laboratories

Figure 3: U.S. Population within 100 Miles of a LRN Laboratory, 50 States and DC, 2007



Source: CDC, DBPR LRN data; 2007

[14] CDC, DBPR LRN data; 2007

Communication among laboratories and public health departments is key, as outbreaks identified in one location can also be present in others.

Table 6: Laboratory Communications, 2001-2006

Indicator	Then (2001)	Now (2006)	Percent Increase
States with public health laboratories that could communicate with clinical and commercial laboratories (through email or fax to multiple recipients)	20[1]	51[2]	155%

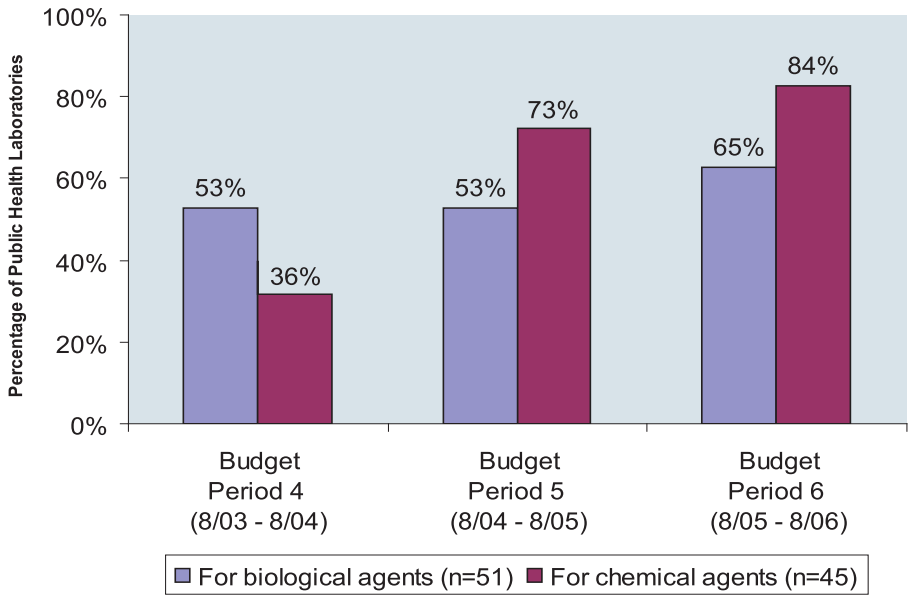
[1] APHL, *Public Health Laboratory Issues in Brief: Bioterrorism Capacity;* published October 2002 - data for 46 states and DC
[2] APHL, *Public Health Laboratory Issues in Brief: Bioterrorism Capacity;* published May 2007 - data for 50 states and DC

monitoring health through routine testing. These laboratories serve as early alert systems and can be the first to confirm a potential health threat. All states now have public health laboratories that can communicate rapidly with these laboratories (Table 6).

Training laboratory staff. Expanding training for clinical laboratory workers is key because they are often the first to confirm diseases leading to public health threats. In 2002, state public health laboratories offered 65 classes to fewer than 3,000 clinical laboratory scientists on testing for biological agents; while in 2006, states offered 500 classes to more than 8,000 laboratory scientists.[15]

Public health laboratories also need to conduct exercises to practice emergency response protocols. Figure 4 shows the increasing number of state public health laboratories conducting exercises to handle Category A biological agents (high-priority agents that pose a risk to national security) and chemical agents (toxic substances such as cyanide-based compounds, heavy metals, and nerve agents). Refer to Appendix 6 for a list of Category A and B biological agents.

Figure 4: Public Health Laboratories Conducting at Least One Exercise for Biological and Chemical Agents, 2003-2006



Source: CDC, DSLR data; 2003-2006
Note: Data for chemical terrorism agent exercises were collected for Level 1 and Level 2 laboratories.

[15] APHL, unpublished data; 2002 and 2006

Coordinated Public Health Response Rapidly Identifies the Source of *E. Coli* Outbreak

Joint laboratory and epidemiology investigations are critical for a rapid response to disease outbreaks.

The public health response to a 2006 outbreak of *E. coli* infections showed how cooperative agreement funding has improved states' ability to respond. The response to the outbreak highlighted the importance of collaboration and communication among public health professionals in the 26 affected states.

In September 2006, state public health departments began investigating an outbreak of infections caused by *E. coli* O157:H7, a dangerous foodborne bacterium, to determine who the outbreak was affecting and how patients had contracted the infection. Public health professionals interviewed both ill and unaffected individuals to identify the source of the outbreak and determined that pre-packaged fresh spinach was the likely cause.

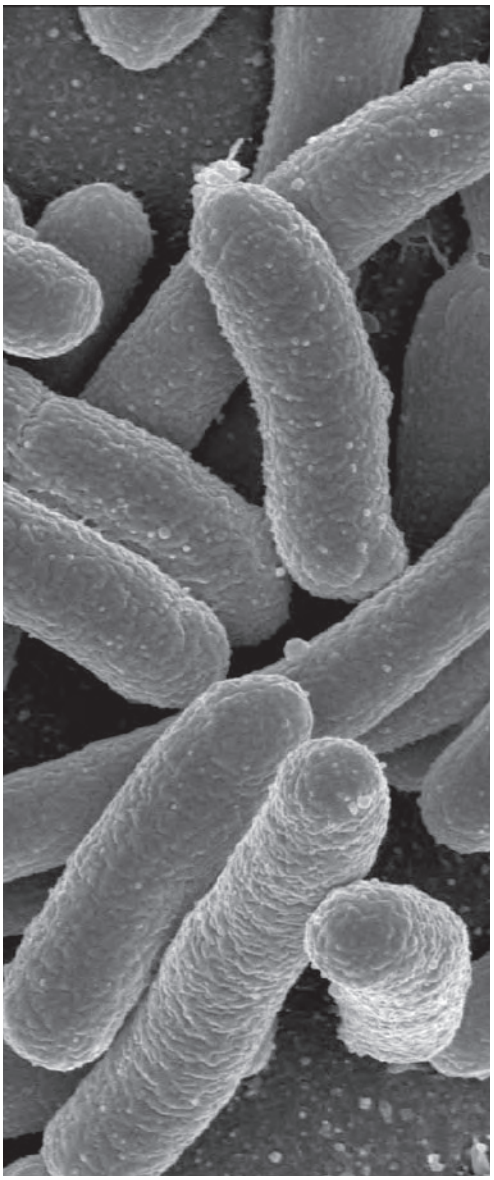
The Food and Drug Administration (FDA) advised consumers not to eat fresh spinach, and CDC sent messages out to the public health community via the Health Alert Network (HAN) and *Epi-X* to alert them of a nationwide outbreak. Federal and affected state health public information officers quickly disseminated and updated critical health information about the outbreak to public health partners, clinicians, and the news media.

Meanwhile, state public health laboratories performed DNA "fingerprinting" tests, or pulsed-field gel electrophoresis (PFGE), to distinguish strains of *E. coli.* Laboratories submitted information about these strains to PulseNet, a national network of laboratories coordinated by CDC that consists of state and local public health departments and federal agencies (CDC, FDA, and USDA). Through PulseNet, public health professionals across the country could compare the DNA fingerprints to determine if their state had cases of *E. coli* related to the outbreak. PulseNet confirmed the outbreak in multiple states.

Public health departments and laboratories in 10 states isolated *E. coli* strains from bags of spinach retrieved from patient households and performed tests to match these to *E. coli* strains isolated from patients. Local, state, and federal health officials collaborated to identify and report cases, communicate with consumers, and identify the source of the outbreak. A joint team of CDC, FDA, USDA, and California public health professionals visited selected farms, tracing the bacteria to the source.

Rapid identification of the bacterium causing the outbreak and tracking to the food source resulted in a nationwide recall of fresh spinach products. Joint laboratory and epidemiology investigations were critical for this rapid response.

Please refer to Section 2 for response examples for each state and directly funded locality.



Challenges for Public Health Laboratories

Boosting the laboratory scientist workforce to ensure rapid and accurate testing. In a 2007 APHL survey, 31 state public health laboratories reported difficulties recruiting qualified laboratory scientists. Moreover, 39 reported needing additional staff to perform polymerase chain reaction, a rapid DNA testing technique to quickly identify bioterrorism agents.[16] This reflects a nationwide shortage of highly skilled laboratory workers to confirm potential health threats.

Ensuring secure electronic communication. Although 44 state public health laboratories have Laboratory Information Management Systems supporting laboratory functions, 19 of those laboratories cannot send or receive electronic messages that meet CDC standards for exchanging, communicating, and protecting data.[17] Without such electronic communication, it is impossible to rapidly monitor and integrate laboratory test results at the national level during an emergency.

Broadening the range of laboratory testing. States vary in the extent to which they can test for biological and chemical agents. For instance, all states have at least one laboratory that can test for the biological agents that cause anthrax, bubonic plague, tularemia, and brucellosis, but eight are not able to test for the highly infectious agent that causes Q fever.[18] For chemical agents, 9 states can test for blistering agents (such as mustard gas); 13 states for volatile organic compounds (chemicals such as benzenes, which can have short- and long-term health effects); 28 states for nerve agents (including manmade chemical warfare agents such as sarin or VX nerve agent); and 30 states for blood metals (such as mercury and lead).[19]

Although state public health laboratories can test for biological and chemical agents in blood or urine, they cannot test for chemical agents outside of these human clinical samples, such as in an unknown white powder. Laboratories are also limited in their ability to rapidly test large quantities of samples for chemical agents.

Another challenge is that no state public health laboratory can rapidly identify priority radioactive materials in clinical samples.[20] This could delay medical treatment decisions when a possible radiological exposure has occurred.

[16] APHL, *Public Health Laboratory Issues in Brief: Bioterrorism Capacity;* published in May 2007 - data for 50 states and DC
[17] APHL, *Public Health Laboratory Issues in Brief: Bioterrorism Capacity;* published in May 2007 - data for 50 states and DC
[18] CDC, DBPR LRN data; 2007
[19] CDC, National Center for Environmental Health (NCEH) data; 2007
[20] CDC, NCEH data; 2007

Response:

Improving Communication Systems and Increasing Planning, Training, and Exercising

Public health professionals are on the front lines during an emergency. Establishing emergency response plans was an initial focus of the cooperative agreement. Now, CDC is emphasizing exercises that test systems and validate training to ensure that plans will work during a real event. These activities support CDC preparedness goals in the areas of prevention, detection and reporting, investigation, control, recovery, and improvement.

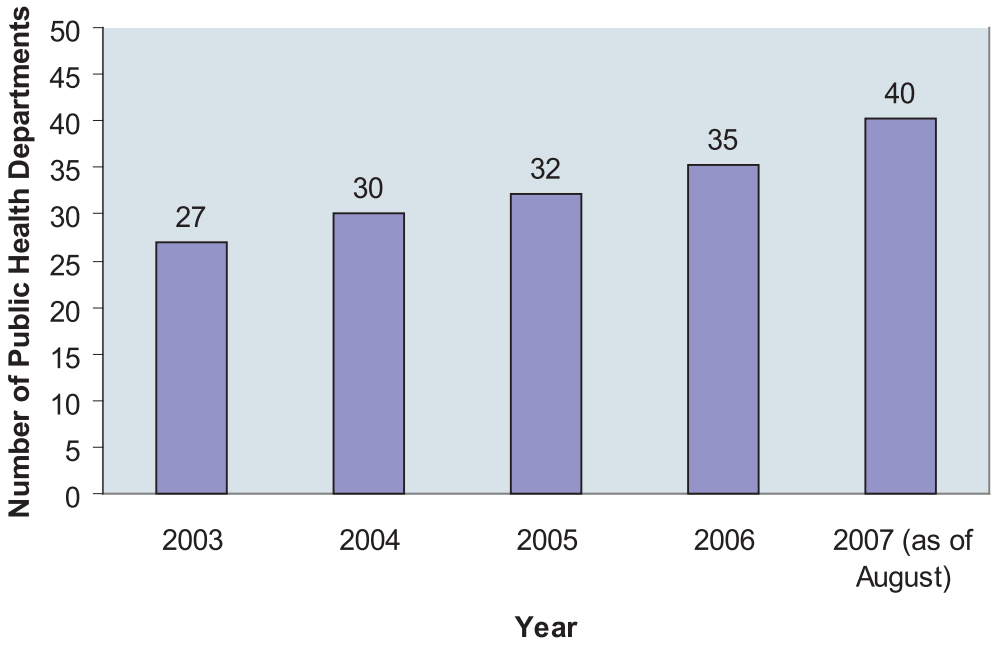
Quickly communicating up-to-date information. During an emergency, communication from public health professionals must be fast and accurate. In 2007, all states had plans for crisis communication with first responders and healthcare providers during an emergency.[21]

In addition, CDC's Health Alert Network (HAN) and state-level HANs provide a mechanism for users, including state and local public health departments, hospitals, and physicians, to rapidly exchange critical public health information. The number of states responding to a test HAN message from CDC in 30 minutes or less has increased by 48% since 2003 (Figure 5).[22]

Public Health Information Network

As part of the Public Health Information Network (PHIN), CDC has established standards for exchanging, communicating, and protecting electronic information both among public health departments and with healthcare, environmental, homeland defense, and other partners. To assist with implementing PHIN standards, CDC works with each state or local public health department funded through the cooperative agreement. CDC provides assistance with gap analyses, self-assessments, project plans, and sharing promising practices.

Figure 5: Public Health Departments Responding to Test HAN Messages in 30 Minutes or Less, 50 States and DC, 2003-2007



Source: CDC, HAN data; 2003-2007

[21] CDC, DSLR Mid-Year Progress Report Review data; 2007

[22] CDC, HAN data; 2003-2007

Emergency response planning helps responders from different jurisdictions and disciplines work together.

Developing emergency response plans. As of 2006, all state public health departments reported having public health emergency response plans. A key element of these plans is detailing roles, responsibilities, and responses to an emergency using the Incident Command System (ICS).[23]

CHEMPACK

CDC's CHEMPACK program has placed over 1,600 containers of nerve agent antidotes. Locations are determined by state and local agencies to help ensure a rapid response to emergencies involving chemical releases. Thirty-nine states already have containers, and seven additional states are in the process of obtaining them.

Distributing the Strategic National Stockpile (SNS). CDC manages the SNS, a national repository of antibiotics, other life-saving medications, and medical supplies, to help public health departments respond to emergencies. The SNS is positioned across the country. In 2001, few states had up-to-date, written plans for receiving, staging, and distributing SNS assets. In contrast, today all states have such plans. Nevertheless, states vary in the sophistication and maturity of the coordination and exercising of those plans.

CDC works closely with state, local, and tribal agencies to help identify and fix SNS planning gaps. CDC reviews the plans annually on a scale from a low of 0 to a high of 100. The reviews include the public health department's coordination with traditional and nontraditional community partners; receiving, staging, and distributing medical materiel; state legal statutes to aid in the rapid dispensing of medications; and the type and frequency of training, exercising, and evaluation of response plans. In 2006-2007, 73% of the states reviewed satisfactorily documented their planning efforts, which is reflected in a review score of 69 or higher (Table 7).

Planning for pandemic influenza. Since 2006, the cooperative agreement has provided specific funding to public health departments to prepare for pandemic influenza. As part of this effort, every state developed a pandemic influenza response plan. Previously, most states did not have completed plans addressing areas such as enhancing surveillance and laboratory capacity, managing vaccines and antivirals, and implementing community containment measures to reduce influenza transmission.[24] In addition, states held summits bringing together partners from state and local public health departments, businesses, schools, hospitals, and other organizations to plan for a potential pandemic.

Training to enhance public health preparedness. An increasing number of staff is now trained to support preparedness and response activities (Figure 6). Subjects covered in the training courses included ICS, risk communication, quarantine and isolation, mental health services during and after emergencies, and working with at-risk populations.[25]

In addition, following the anthrax attacks of 2001, CDC developed the "Forensic

Table 7: CDC Reviews of State Strategic National Stockpile Plans, 50 States, 2006-2007

Review Score	Number of States
69-100	36
0-68	13
Review in progress*	1

Source: CDC Division of Strategic National Stockpile (DSNS) data; 2006-2007

*CDC has not completed reviewing all states using a new numerical technical assistance review tool.

[23] The Incident Command System (ICS) is the organizational structure for managing incidents that require response from different jurisdictions and disciplines. ICS lays out standard roles and responsibilities for the incident commander and staff.

[24] CDC, Pandemic Influenza State Self-Assessments data; 2006

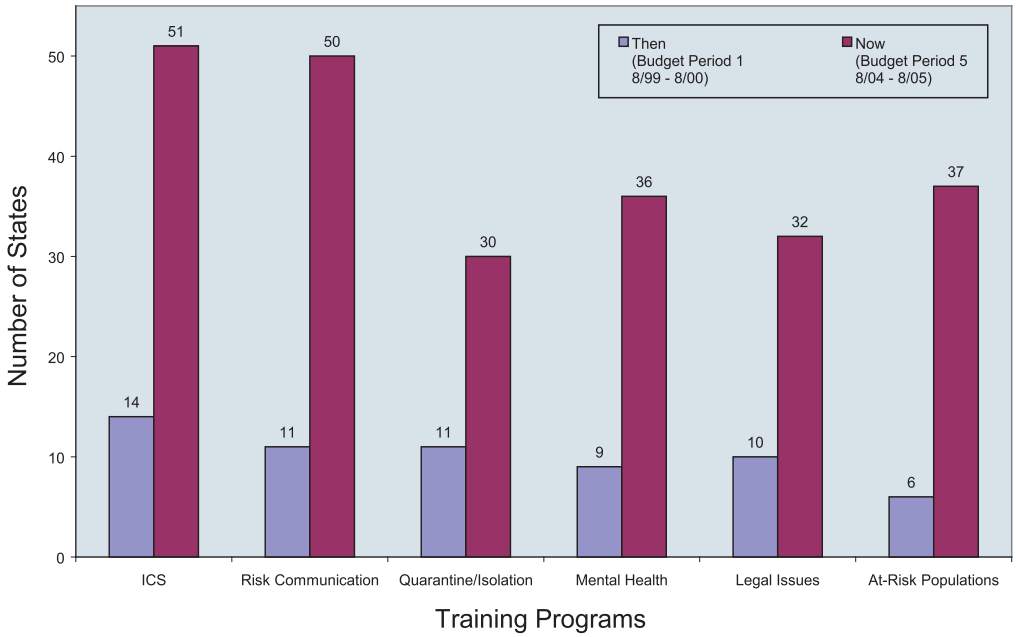
Exercises Test Public Health Systems and Foster Partnerships

In November 2006, a mass vaccine dispensing exercise was coordinated by the Navajo Area Indian Health Services and the Navajo Division of Health. The exercise provided almost 24,000 seasonal influenza vaccines at 15 different sites around the Navajo Nation (about 25,000 square miles). The exercise simulated a response to a pandemic influenza outbreak. The exercise also tested risk communication and the SNS delivery systems. Several dispensing sites vaccinated as many as 1,000 people per hour during peak times.

The Navajo public health system is large and complex, consisting of tribal and federal health agencies as well as agencies from three states and multiple counties. During the exercise, these health agencies worked with the Navajo Police, the National Guard, the National Park Service, and others using ICS. The cooperation demonstrated by these different agencies during the exercise will contribute to future successful emergency responses.

Please refer to Section 2 for response examples for each state and directly funded locality.

Figure 6: States Offering Training Courses to State and Local Public Health Professionals, 50 States and DC, 1999-2005



Source: CDC, DSLR data; 1999-2005

[25] At-risk or vulnerable population groups may have additional needs before, during, and after an incident in one or more of the following functional areas: maintaining independence, communication, transportation, supervision, and medical care. Individuals in need of additional response assistance may include those who have disabilities; who live in institutionalized settings; who are elderly; who are children; who are from diverse cultures, who have limited English proficiency, or who are non-English speaking; or who are transportation disadvantaged.

Exercises test plans, validate training, and build relationships so people know their roles and responsibilities during an emergency.

Epidemiology" course as a tool for state and local public health departments and law enforcement agencies to improve joint investigations of terrorism. As of 2004, over 14,000 public health and law enforcement professionals had participated in this course, and staff are continuing to be trained.

Exercising emergency response plans and validating training. Exercises test emergency response plans with personnel from across agencies and organizations.[26] Exercises can provide valuable experience and knowledge because people, technology, and equipment are put into action to test their ability to respond.

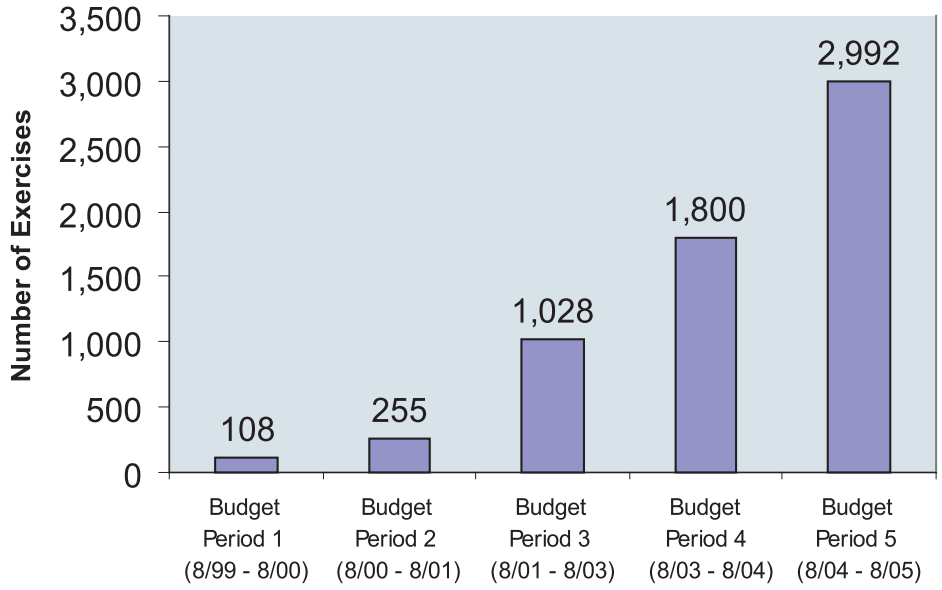
Figure 7 illustrates a steadily increasing number of exercises conducted by public health departments in the 50 states and DC. In addition, public health departments routinely evaluate exercises or real events and identify needed improvements.

CDC specifically coordinates exercises with state and local public health departments to test plans for the receipt and distribution of the contents of the SNS. The number of CDC-coordinated SNS exercises has increased from 0 in 2001 to 18 in 2006 (Figure 8).

Cities Readiness Initiative

The cooperative agreement funds cities to distribute medications to their entire population within 48 hours. The Cities Readiness Initiative began with 21 cities in 2004 and has expanded to 72 cities. This includes more than 500 counties, covering 56% of the U.S. population.[27] Because of the complexity of providing medicine to so many people, the program involves ongoing planning and exercises. For instance, in a June 2007 exercise, Philadelphia postal workers delivered more than 50,000 mock packages of emergency medication to people in their homes, exercising a novel delivery method. Similar exercises occurred in Boston and Seattle.

Figure 7: Public Health Preparedness Exercises, 50 States and DC, 1999-2005



Source: CDC, DSLR data; 1999-2005

[26] Exercises provide opportunities to test capabilities and improve performance in a risk-free environment. The three types of exercises include tabletop exercises, which involve discussing responses to emergency scenarios and focus on training and problem solving; functional exercises, which test and evaluate capabilities and functions in responding to a simulated emergency, such as a disease outbreak; and full-scale exercises, which test and evaluate multi-agency, multi-jurisdictional coordinated response to an actual deployment of resources under crisis conditions as if a real incident had occurred.

[27] CDC, DSNS Cities Readiness Initiative data; 2007

Challenges for Response

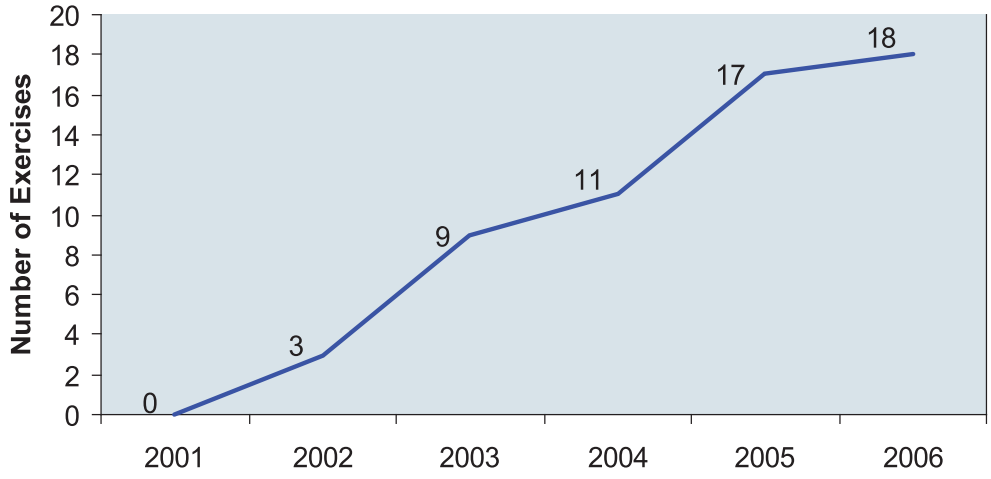
Ensuring public health uses an "all-hazards" approach to preparedness. Because of the many competing priorities for public health departments' resources, being prepared to respond to a wide variety of emergencies remains a challenge. In 2006, all states and DC reported having plans covering biological agents, but fewer reported having plans covering radiation (43) or nerve agents (27).[28]

Retaining experienced public health response personnel. Ensuring that public health departments retain qualified response personnel is an ongoing challenge. A number of state and local agencies have difficulties retaining SNS coordinators.

Building and maintaining relationships. To build and maintain relationships with response partners, public health professionals need to continue planning and exercising with other government agencies and the community. Building these relationships requires other responders to recognize the importance of public health in emergency response. In 2006, most states and DC reported having developed ICS roles and responsibilities with hospitals (90%) and local/regional emergency management agencies (92%), but fewer (73%) had developed them with federal emergency management agencies.[29]

Developing interoperable communication systems. Multiple agencies can work together more effectively during an emergency if all communication systems can "talk" to each other. In 2007, DHS reported that many cities and metropolitan areas have established multi-agency communications, but more progress is needed to expand interoperable communication across jurisdictions and levels of government.[30]

Figure 8: Annual Number of Joint SNS Exercises to Test Response Plans, 50 States and DC, 2001-2006



Source: CDC, DSNS data; 2001-2006

Note: Figure 8 only includes joint state/CDC exercises. States also conduct exercises independently that are not included in these numbers.

[28] CDC, DSLR data; 2006

[29] CDC, DSLR data; 2006

[30] DHS, *Tactical Interoperable Communications Scorecards: Summary Report and Findings*; 2007

Exercises Prepared Public Health Response to a Meningitis Outbreak

When a meningococcal meningitis outbreak occurred at a local high school in Los Angeles, California, in 2006, the local public health department responded.

The public health department was ready because vaccination exercises had been conducted before the outbreak. The exercises provided public health department staff experience in working directly with the local and county law enforcement agencies, fire departments, and emergency medical services. This was valuable during the meningitis outbreak because collaboration resulted in effective site security, traffic control, and emergency medical technician response at the high school.

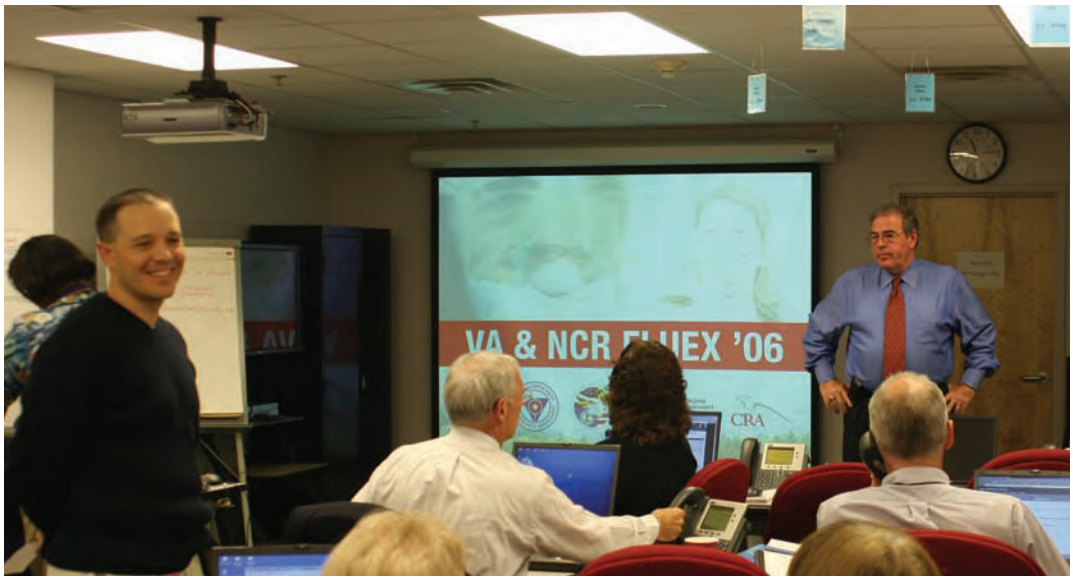
The County of Los Angeles Department of Public Health reported that "before, the setup and response to a disease outbreak took far longer, sometimes an entire day or more; site organization and management was often overwhelming, and at times chaotic." A timely response reassured students and their parents that they were being well taken care of by the Department of Public Health during this outbreak.

Please refer to Section 2 for response examples for each state and directly funded locality.

Moreover, the report noted that some of the communications planning and exercises among response agencies did not include public health departments.

Monitoring environmental health. Environmental effects from an emergency, such as a chemical spill, need to be monitored over extended periods to track potential long-term health outcomes. In 2007, 11 states did not report any activities related to having systems that can track environmental exposures and adverse events over the long term.[31]

Helping at-risk populations during emergencies. CDC's experience responding to Hurricanes Katrina and Rita showed that CDC and state public health departments must address the needs of at-risk populations in an emergency. For example, the elderly and others with chronic diseases need help to control diseases such as diabetes and heart conditions when health systems are not available.



[31] CDC, DSLR Mid-Year Progress Report Review data; 2007

Moving Forward:

CDC and Public Health Departments Are Working to Address Challenges

Public health professionals need to continually train and exercise to improve performance. Laboratory and other equipment must be maintained to work well during an emergency. Response plans must be updated to address emerging health threats. Accordingly, an ongoing national commitment to public health preparedness will allow state, local, tribal, and territorial public health departments to maintain their current abilities and take the next steps necessary to improve emergency response.

Public health departments still face many challenges in improving preparedness. Appendices 3 and 4 present information on CDC and ASPR activities to strengthen preparedness. Examples of CDC initiatives are presented below.

- **Electronic data for preparedness.** CDC is establishing standards and providing technical assistance to allow the exchange of electronic health data across organizational and jurisdictional boundaries.

- **Laboratory testing.** CDC is working with state public health laboratories to expand their biological and chemical testing abilities. For radiological testing, CDC is developing rapid laboratory methods to analyze radioactive materials in clinical samples and build capacity in state or federal laboratories to measure radioactive contaminants in these samples.

- **At-risk populations.** CDC has established commercial partnerships to supply needed medicines to at-risk populations during an emergency. With these partnerships, CDC can quickly supply childhood vaccines, medications for a variety of chronic diseases, or other medicines.

- **Public health workforce and training.** CDC and its partners developed the Meta-Leadership Summit for Preparedness, a nationwide program that trains business, government, and non-profit leaders to act effectively during times of crisis. In addition, the Centers for Public Health Preparedness, a national network of academic institutions with a common focus on public health preparedness, are developing a national preparedness core curriculum.

- **Legal preparedness.** CDC's initiatives include enhancing training courses on legal preparedness for public health professionals and other first responders. In addition, CDC is helping states and other jurisdictions implement public health mutual aid agreements, which enable sharing of supplies, equipment, personnel, and information during emergencies.

- **Technical assistance to public health departments.** CDC provides ongoing technical assistance to public health departments to help address preparedness challenges. The technical assistance includes sharing CDC public health expertise, identifying promising practices, providing guidance for exercises, and developing performance goals.

- **Exercising public health systems.** CDC joins other federal agencies in requiring that public health departments and other response agencies receiving federal funds exercise capabilities using Homeland Security Exercise and Evaluation Program principles. Exercises range from discussion-based tabletop exercises used to discern gaps in emergency response plans to full-scale operations-based exercises that test communication and coordination within the community's entire response system.

- **Standards for preparedness.** CDC and NACCHO are collaborating on Project Public Health Ready to develop standards for local public health preparedness. CDC is also working with partners to develop a voluntary accreditation program for state and local public health departments.

- **Measuring public health preparedness.** CDC is expanding and improving preparedness data to present a clearer picture of the status of public health preparedness in the United States and to promote accountability, as reinforced by the Pandemic and All-Hazards Preparedness Act, signed in December 2006. These data will assist CDC and public health departments in identifying specific areas for improvement. CDC is committed to developing appropriate, specific, measurable, and validated performance measures to foster improvement in public health preparedness.

Achieving the overarching goal, "people prepared for emerging health threats," is critical to the health and safety of our communities. This report represents CDC's commitment to sharing information on a program that contributes to this goal. Future reports will show the extent to which CDC and public health departments are making progress towards achieving preparedness goals.