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PUBLIC HEALTH PREPAREDNESS:

# 2011 STATE-BY-STATE UPDATE ON LABORATORY CAPABILITIES AND RESPONSE READINESS PLANNING

AN UPDATE ON CDC-FUNDED PREPAREDNESS AND  
RESPONSE ACTIVITIES IN 50 STATES AND 4 CITIES  
SEPTEMBER 2011

INDIANA

KANSAS

NEW JERSEY

OHIO

PENNSYLVANIA

ALABAMA

NEW MEXICO

MICHIGAN

GEORGIA

KENTUCKY

ARKANSAS

CALIFORNIA

SOUTH CAROLINA

COLORADO

OKLAHOMA

VIRGINIA

LOUISIANA

MARYLAND

FLORIDA

MISSISSIPPI

NORTH CAROLINA



Centers for Disease Control and Prevention  
Office of Public Health Preparedness and Response

TENNESSEE

## ACRONYMS

|       |  |
|-------|--|
| CDC   | Centers for Disease Control and Prevention                 |
| CRI   | Cities Readiness Initiative                                |
| DHS   | U.S. Department of Homeland Security                       |
| EOC   | Emergency Operations Center                                |
| HAN   | Health Alert Network                                       |
| HHS   | U.S. Department of Health and Human Services               |
| HPP   | Hospital Preparedness Program cooperative agreement        |
| LRN   | Laboratory Response Network                                |
| MSA   | Metropolitan statistical areas                             |
| OMB   | Office of Management and Budget                            |
| PFGE  | Pulsed-field gel electrophoresis                           |
| PHEP  | Public Health Emergency Preparedness cooperative agreement |
| PHPR  | Office of Public Health Preparedness and Response, CDC     |
| PopPT | LRN Emergency Response Pop Proficiency Test                |
| RSS   | Receipt, stage, and store facility                         |
| SNS   | Strategic National Stockpile                               |
| TAR   | Technical assistance reviews                               |

# Public Health Preparedness:

## 2011 State-by-State Update on Laboratory Capabilities and Response Readiness Planning

An Update on CDC-Funded Preparedness and  
Response Activities in 50 States and 4 Cities  
September 2011

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CDC provides funding and technical assistance to state and local health departments to build and strengthen their capabilities needed for rapid response to emerging threats as well as for routine public health activities.

## Background

Public health works behind the scenes and on the front lines every day to save lives and safeguard communities from health threats.

These threats can include the following:

- Naturally occurring disease outbreaks, such as a measles outbreak in a college dormitory, a multistate outbreak due to contaminated food, or a global pandemic caused by a novel virus
- Natural disasters such as hurricanes, wildfires, and ice storms
- Accidents such as chemical spills and explosions
- Intentional incidents such as biological, chemical, or nuclear terrorism

All these threats have potential for harming the public and affecting the economic and social well-being of our communities and nation.

Preparing adequately for public health threats requires continual and coordinated efforts that involve every level of government, the private sector, non-governmental organizations, and individuals.

### Supporting Preparedness and Response Across the Nation

Because of its unique abilities to detect and respond to infectious, occupational, or environmental threats, the Centers for Disease Control and Prevention (CDC) plays a pivotal role in helping states prevent, detect, respond to, and rapidly recover from all types of public health threats.<sup>1</sup> CDC's work in preparedness builds upon decades of science developed to promote the public's health.

To enhance preparedness and response, CDC supports state and local public health systems so they are better able to fulfill their responsibilities for the public health and welfare of the people in their jurisdiction. State and local governments

are closest to those impacted by incidents and have always had the lead in response. During a response, states coordinate resources and capabilities throughout the state and obtain additional resources and capabilities from other states and the federal government.

**Preparing states for threats.** All detection and response to public health threats begins at the local level, and communities must have strong and flexible capabilities that can be tapped for quick response to whatever threats emerge. CDC provides funding and technical assistance to state and local health departments to build and strengthen their capabilities needed for rapid response to emerging threats as well as for routine public health activities. This support is provided through CDC's Public Health Emergency Preparedness (PHEP) cooperative agreement.

Earlier this year, CDC established national standards<sup>2</sup> for public health preparedness to help state and local public health departments identify gaps, determine specific jurisdictional priorities, and develop plans for building and sustaining capabilities. This capabilities-based approach merges public health and emergency management capabilities and serves as a framework for addressing state and local preparedness priorities and achieving desired outcomes. This new framework includes 15 public health preparedness capabilities (see box on page 3) that align with the National Health Security Strategy<sup>3</sup> and other national preparedness priorities. With this framework, public health departments now have evidence-informed guidance in developing annual and long-term plans to guide their preparedness strategies and investments. In addition to establishing national standards for public health preparedness, CDC has developed associated performance measures to demonstrate progress toward achieving these capabilities.

## 15 Public Health Preparedness Capabilities

CDC continues to work to better define what it means to be prepared for all threats. This year, CDC identified 15 public health preparedness capabilities as the basis for state and local public health preparedness. CDC has prioritized these into two tiers, with an emphasis on those (Tier 1) that provide a strong basic foundation for public health preparedness.

### Biosurveillance

- Public Health Laboratory Testing (Tier 1)
- Public Health Surveillance and Epidemiological Investigation (Tier 1)

### Community Resilience

- Community Preparedness (Tier 1)
- Community Recovery (Tier 2)

### Countermeasures and Mitigation

- Medical Countermeasure Dispensing (Tier 1)
- Medical Materiel Management and Distribution (Tier 1)
- Non-pharmaceutical Interventions (Tier 2)
- Responder Safety and Health (Tier 1)

### Incident Management

- Emergency Operations Coordination (Tier 1)

### Information Management

- Emergency Public Information and Warning (Tier 1)
- Information Sharing (Tier 1)

### Surge Management

- Fatality Management (Tier 2)
- Mass Care (Tier 2)
- Medical Surge (Tier 2)
- Volunteer Management (Tier 2)

Source: *Public Health Preparedness Capabilities: National Standards for State and Local Planning*. Available at [www.cdc.gov/phpr/capabilities](http://www.cdc.gov/phpr/capabilities)

**Helping states respond to emergencies.** When disaster strikes, CDC is also prepared to respond and support national, state, and local partners with additional resources. CDC's Emergency Operations Center serves as a round-the-clock command center to coordinate expertise for efficient information exchange with state partners, and to deploy CDC staff and equipment to the site of an emergency. CDC's Strategic National Stockpile also stands ready to deliver critical medicines and medical supplies to states when local supplies run out or are commercially unavailable.

**Overview of federal response to emergencies.** CDC's Office of Public Health Preparedness and Response leads the agency's preparedness and response activities by providing strategic direction, support, and coordination for activities across CDC as well as with local, state, tribal, national, territorial, and international public

health partners.<sup>4</sup> The mission of this office is to strengthen and support the nation's health security to save lives and protect against public health threats. When public health is prepared, people's health is protected and communities are more resilient.

CDC's public health response activities are coordinated through the Assistant Secretary for Preparedness and Response, the principal advisor to the Secretary of the U.S. Department of Health and Human Services on all matters related to bioterrorism and other public health emergencies. Lead federal responsibility for emergency response lies with the U.S. Department of Homeland Security (DHS), whose National Response Framework established a single comprehensive structure for responding to all types of hazards.<sup>5</sup> In addition, the DHS National Preparedness Guidelines provide the vision, capabilities, and priorities for national preparedness.

## About This Update Report

CDC has now published four preparedness reports to demonstrate how federal investments are improving the nation's ability to respond to public health threats and emergencies.<sup>6</sup> This report is an update to CDC's 2010 state-by-state report; it presents available data that demonstrate trends and document progress in two important preparedness activities, laboratory capabilities and response readiness planning. These data do not represent all preparedness activities occurring in states and localities. As other data become available, they will be included in future reports.

Fact sheets in this report present data on activities occurring from 2007 to 2010 in the 50 states and 4 localities (Chicago, Los Angeles County, the District of Columbia, and New York City) directly funded by CDC's PHEP cooperative agreement.

The report is organized as follows:

**Key Findings and Moving Forward** provides a summary of progress reported and a brief

overview of current challenges and plans to improve the impact and effectiveness of preparedness and response activities.

**Section 1** presents an overview of progress and national-level data on the following:

- Laboratory activities critical for identifying and confirming health threats
- Response readiness planning activities related to the ability of a state or metropolitan statistical area to receive, stage, and store medical assets received from CDC's Strategic National Stockpile

**Section 2** features fact sheets with data on laboratory and response readiness planning activities in the 50 PHEP-funded states and the 4 localities of Chicago, the District of Columbia, Los Angeles County, and New York City.

**Appendices** provide explanations of the fact sheet data points and their significance, and present technical assistance review scores for the Cities Readiness Initiative of CDC's Strategic National Stockpile.

This report is an update to CDC's 2010 state-by-state report; it presents available data that demonstrate trends and document progress in two important preparedness activities, laboratory capabilities and response readiness planning.

# Key Findings and Moving Forward

Strong state and local public health systems are the cornerstone of an effective response to routine as well as large-scale and/or unexpected public health incidents. Public health departments have made progress in building and strengthening their preparedness and response capabilities. A summary of progress in laboratory capabilities and response readiness planning follows.

## Laboratories: Identifying and Understanding Emerging Public Health Threats

Laboratories identify disease agents, toxins, and other health threats found in clinical specimens, food, or other substances. Rapid detection and characterization of health threats is essential for implementing appropriate control measures that can help mitigate the impact of the threats. The ability to detect and characterize health threats relies on the availability of laboratory equipment, a trained workforce, accurate and consistent methods, and quick data-exchange systems.

Accomplishments for biological and chemical laboratories for 2008 to 2010 include the following:

- Biological laboratory capabilities and capacities were strong in most states and localities. Overall, biological laboratories improved their abilities to rapidly identify certain disease-causing bacteria (often implicated in foodborne disease outbreaks) and send reports to CDC. For example, the number of states that submitted at least 90% of *E. coli* test results to CDC's PulseNet database within 4 working days of receiving the samples increased from 29 in 2008 to 38 in 2010. In addition, Laboratory Response Network (LRN) biological laboratories successfully maintained a high proficiency

test pass-rate for detecting other biological agents – the pass rate was consistently over 90% from 2008 to 2010. (See Table 4 on page 14.)

- LRN chemical laboratories increased their abilities to rapidly detect and quantify chemical agents. The average total number of methods successfully demonstrated by the more advanced LRN laboratories (Levels 1 and 2) to rapidly detect chemical agents during proficiency testing rose from 6.7 methods in 2009 to 8.9 methods in 2010. (See Table 4 on page 15.) These methods are important for determining how widespread an incident was, identifying individuals needing treatment, and helping law enforcement officials determine the origin of the agent.
- In addition, LRN's most advanced chemical laboratories (Level 1) dramatically reduced the amount of time needed to process and report on samples during the LRN Surge Capacity Exercise. This exercise demonstrates the ability of our nation to respond to a large-scale chemical incident like the Tokyo sarin subway attack of 1995. Between 2009 and 2010, the average hours to process and report on 500 samples by Level 1 laboratories during this exercise decreased from 98 hours to 56 hours. (See Table 4 on page 15.)

## Response Readiness Planning: Improving Response to Threats through Planning for Medical Asset Distribution

Responding effectively to a public health emergency often requires complex logistical planning for activities such as the distribution of medicines or other supplies to a community.

Public health departments have made progress in building and strengthening their laboratory capabilities and response readiness planning.



Today, public health departments face increasing challenges that may jeopardize their abilities to support a sufficient response to a public health incident.

Because these activities involve many different community agencies, everyone involved in emergency response must plan strategies and regularly exercise (practice) them together. All 50 states and the 4 localities directly funded by the Public Health Emergency Preparedness (PHEP) cooperative agreement have plans for receiving, staging, storing, distributing, and dispensing medical assets from CDC's Strategic National Stockpile (SNS) and other sources. CDC and state public health personnel conduct annual technical assistance reviews (TAR) to assess these plans and ensure continued readiness. Response readiness planning accomplishments for 2007 to 2010 include the following:

- Most states improved their abilities to receive, distribute, and dispense medical assets received from the SNS from 2007 to 2010. The national average for state TAR scores increased from 87 (out of 100) in 2007-08 to 94 in 2009-10. (A score of 69 or higher in 2007-08 and 2008-09 indicated that a state performed in an acceptable range. The acceptable threshold score increased to 79 or higher for 2009-10.)
- Average scores for the metropolitan statistical areas (MSAs) in CDC's Cities Readiness Initiative (CRI) also improved over time. CRI MSAs are selected based on population, geographical location, and potential vulnerability to a bioterrorism threat. The CRI program is designed to better prepare major U.S. metropolitan areas to effectively receive, distribute, and dispense medical countermeasures to their entire populations in a short time in response to large-scale public health emergencies. The national average for the 72 CRI MSAs increased from 68 (out of 100) in 2007-08 to 88 in 2009-10. (Acceptable thresholds were 69 or higher in 2007-09 and 79 or higher for 2009-10.)

## Moving Forward

An effective public health response begins with a strong public health system that can conduct routine public health activities and adequately surge to meet the needs of a jurisdiction during a large-scale or unexpected emergency.

Today, public health departments face increasing challenges that may jeopardize their abilities to support a sufficient response to a public health incident. Challenges include continuing budget cuts at federal and state levels, workforce shortages, and an ever-evolving list of public health threats. In 2010, 12 (24%) states did not submit 90% of *E. coli* test results to CDC's PulseNet database within 4 working days, slowing down identification of outbreaks (see Table 2 on page 11). These and other challenges are causing state and local planners to express concerns over the ability to sustain the real and measureable advances made in public health preparedness.

Public health officials likely will need to make difficult choices to ensure that federal dollars are directed to priority functions and services that result in more resilient and better prepared communities. CDC's *Public Health Preparedness Capabilities: National Standards for State and Local Planning*<sup>2</sup> provides a guide that state and local public health departments can use to plan their priorities and decide which capabilities they have the resources to build or sustain.

CDC strongly recommends that states and localities receiving PHEP funding prioritize the order of the 15 public health preparedness capabilities in which they intend to invest. Their evaluations should be based on assessments of jurisdictional risks and current capabilities and gaps. In addition, CDC encourages state and local public health departments to focus on building capabilities that provide a strong foundation for



public health preparedness. Toward that end, CDC has prioritized the 15 capabilities into two tiers with an emphasis on Tier 1 (see box on page 3).

Looking ahead, HHS is working to better align the PHEP and Hospital Preparedness Program (HPP) cooperative agreements to improve their impact and effectiveness. The HPP, managed out of the HHS Office of the Assistant Secretary for Preparedness and Response, provides leadership and funding to improve surge capacity and enhance community and hospital preparedness

for public health emergencies.<sup>7</sup> The alignment of PHEP and HPP will be accomplished through one Funding Opportunity Announcement in 2012 that will facilitate joint coordination of grants administration, management, and performance reporting. This closer alignment will advance national preparedness by strengthening collaboration between public health and medical preparedness – major components of national health security – and will also reduce the current programmatic burdens on funding recipients as well as federal government costs.

## Section 1: A National Snapshot of Public Health Preparedness Activities

- Laboratory Capabilities: Identifying and Understanding Emerging Public Health Threats
- Response Readiness Planning: Improving Response to Threats through Planning for Medical Asset Distribution

# Laboratory Capabilities: Identifying and Understanding Emerging Public Health Threats

Laboratories are a critical component of rapid response to health threats. They identify disease agents, toxins, and other health threats found in clinical specimens, food, or other substances. Rapid detection and characterization of health threats is essential for implementing appropriate control measures to mitigate the impact of these threats. During the 2009 H1N1 influenza pandemic, for example, laboratories around the country were able to rapidly test for and confirm infections, which supported decisions about treatments and measures to control the spread of disease. The ability to detect and characterize health threats relies on the availability of laboratory resources (including a trained workforce), accurate and consistent methods, and quick data-exchange systems.

CDC manages the Laboratory Response Network (LRN), a group of local, state, federal, and international laboratories with unique testing capabilities for confirming high priority biological and chemical agents. Located strategically across the United States and abroad, LRN member laboratories play a critical role in their state or locality's overall emergency response plan to detect, characterize, and communicate about confirmed threat agents. Members perform standardized tests yielding reliable results within hours. Approximately 90% of the U.S. population lives within 100 miles of an LRN laboratory, decreasing the time needed to begin the response to a terrorist attack or naturally occurring outbreak.

Highlights of state and locality laboratory activities related to preparedness appear on the following pages. See the summary table on pages 14-15 for national-level data on laboratory activities (Table 4).

## Nationwide Testing for Responding to Biological Threats

The Laboratory Response Network (LRN) was established in 1999 to create national laboratory capacity for testing biological threat agents and dangerous toxins. Specific examples of biological threats include anthrax, smallpox, plague, and botulism.<sup>8</sup>

LRN biological laboratories are designated as national, reference, or sentinel laboratories.

- *National laboratories*, including those at CDC, have the most advanced capabilities. These laboratories are responsible for specialized strain characterizations, bioforensics, select agent activity, and handling highly infectious agents.
- *Reference laboratories* perform tests to detect and confirm the presence of a threat agent.
- *Sentinel laboratories* are commercial, private, and hospital-based laboratories that test clinical specimens in order to either rule out suspicion of a biological threat agent or ship to reference or national laboratories for further testing.

CDC provides funding through the Public Health Emergency Preparedness (PHEP) cooperative agreement to the 50 states and 4 localities to establish and maintain LRN biological public health laboratories. In addition to the laboratories that receive PHEP funding, other laboratories that participate in the LRN include state and locally funded public health laboratories as well as federal, military, international, agricultural, veterinary, food, and environmental testing laboratories.

Laboratories play a critical role in their state or locality's overall emergency response plan to detect, characterize, and communicate about confirmed threat agents.

In 2010, a total of 142 LRN laboratories in the United States could test for biological agents; 139 of these were reference laboratories and 3 were national laboratories.<sup>9</sup> These laboratories maintain relationships with numerous sentinel laboratories in their jurisdictions that refer suspicious specimens to them for more advanced testing.

Highlights of state and local activities conducted to enhance their laboratory capabilities follow. See individual fact sheets starting on page 20 for specific scores.

**Most laboratories passed proficiency tests for detecting biological agents.** CDC conducts proficiency testing to evaluate the ability of LRN reference and national biological laboratories to receive, test, and report one or more suspected biological agents to CDC. If a laboratory is unable to successfully test for an agent and report results within a specified period of time, it will not pass the proficiency test. From 2008 to 2010, LRN biological reference and national laboratories successfully maintained a high proficiency test pass-rate to identify biological agents in unknown samples (Table 1).

**Training and outreach to sentinel laboratories continues.** Sentinel laboratories play a key role in the early identification and response to emerging infectious diseases including potential bioterrorism events. From August 10, 2009 to August 9, 2010, 43 state public health laboratories (84%) reported sponsoring sentinel

laboratory training in their state. It is important to note that state public health laboratories continued to communicate emerging health information with sentinel laboratories from 2008 to 2010. For example, in 2008 and 2010, 47 out of 51 state public health laboratories (including the District of Columbia) used CDC's Health Alert Network (HAN) or other rapid method (blast email or fax) to communicate with sentinel laboratories and other partners for outbreaks, routine updates, training events, and other applications.<sup>10</sup>

**Laboratories improved their abilities to rapidly identify disease-causing bacteria.**

Public health officials must be able to quickly and accurately detect and determine the extent and scope of potential outbreaks and minimize their impacts. In 2011, for example, public health officials in several states worked with CDC to investigate a multistate outbreak of human infections linked to eating a type of sausage contaminated with the bacteria *Escherichia coli* O157:H7. The investigation led to the recall of some 23,000 pounds of the product, preventing additional illnesses and hospitalizations.

States and the District of Columbia receive CDC PHEP funding and are required to demonstrate that they can identify specific strains of *E. coli* O157:H7 and *Listeria monocytogenes* – both associated with foodborne disease outbreaks – and report results to CDC's PulseNet database within a target timeframe of 4 working days of receiving the samples.

Table 1: Proficiency Tests Passed by LRN Reference and/or National Laboratories; 2008-2010

| Number of proficiency tests passed by LRN reference and/or national laboratories |                         |                         |
|--|-------------------------|-------------------------|
| 2008   | 2009                    | 2010                    |
| 261 out of 277<br>(94%)  | 195 out of 204<br>(96%) | 312 out of 327<br>(95%) |

Source: CDC, OI (NCEZID); 2008 data: 1/08-9/08; 2009 data: 1/1/09-12/31/09; 2010 data: 1/1/10-12/31/10

Table 2: Rapid Identification of Disease-Causing Bacteria by PulseNet Laboratories; 2008-2010

| Disease-Causing Bacteria               | Number of states submitting at least 90% of test results to CDC's PulseNet database within 4 working days |                    |                    |
|--|---|--------------------|--------------------|
|  | 2008*   | 2009**             | 2010**             |
| <b><i>Escherichia coli</i> O157:H7</b> | 29 out of 50 (58%)  | 32 out of 51 (63%) | 38 out of 50 (76%) |
| <b><i>Listeria monocytogenes</i></b>   | 18 out of 32 (56%)  | 18 out of 28 (64%) | 21 out of 31 (68%) |

Source: CDC, OPHPR (DSLRL); 2008 data: 8/31/07-8/9/08; 2009 data: 8/10/08-8/9/09; 2010 data: 8/10/09-8/9/10

\*Data for the 50 states; \*\*Data for the 50 states and District of Columbia

PulseNet is a national network of public health and food regulatory agency laboratories coordinated by CDC. Participant laboratories perform DNA “fingerprinting” of bacteria by pulsed-field gel electrophoresis, which distinguishes strains of these bacteria.

States have improved their abilities to rapidly identify these bacteria. The number of states that submitted at least 90% of *E. coli* and *L. monocytogenes* test results to CDC’s PulseNet database within 4 working days increased

between 2008 to 2010 (Table 2). For those states that missed the 4-day benchmark for *E. coli* in 2010, the most commonly reported reason was laboratory workforce issues. Specifically, seven states reported issues such as staff shortages and lack of trained staff. Similarly, five states reported in 2010 that their *L. monocytogenes* data submission was affected by staffing issues such as staff turnover and furloughs. For additional information regarding laboratory workforce issues, see the box below.

### States Facing Challenging Workforce Issues

From 2008 to 2010, more than 44,000 jobs were lost in state and local health departments, reducing staff such as public health physicians and nurses, laboratory specialists, and epidemiologists. Laboratorians provide critical expertise to effectively identify and respond to public health emergencies. According to a 2010 national survey, public health laboratories across the country are experiencing significant difficulties maintaining the highly skilled workforce of laboratorians necessary to ensure an effective response. State public health laboratories reported that the factors most severely impacting their workforce were non-competitive salaries (52%), lack of funding (48%), and hiring freezes (43%). From 2009 to 2010, the number of states reporting furloughs as a major workforce barrier increased from 32% to 39%. In addition, CDC found that despite the overall progress reported by states in identifying specific bacteria associated with foodborne disease outbreaks, many states reported being unable to achieve performance measure benchmarks in 2010; workforce issues were among the reasons cited for missing the benchmark. As budget cuts continue, more state public health services and functions will likely be impacted, affecting states’ ability to respond rapidly and effectively to public health threats.

Sources: National Association of County & City Health Officials and Association of State and Territorial Health Officials, Letter to Congress Regarding Cuts Proposed in H.R. 1363 (April 7, 2011); Association of Public Health Laboratories, Response by the Numbers: The Nation’s Public Health Laboratories Protect the Country (2011); and CDC, OPHPR (DSLRL); 2010 data: 8/10/09-8/9/10

## Nationwide Testing for Responding to Chemical Threats

In 2003, the LRN started testing clinical specimens to measure human exposure to toxic chemicals. LRN chemical laboratories are designated as Level 1, 2, or 3.

- *Level 1 laboratories* have the most advanced capabilities. These are surge-capacity laboratories that can test for an expanded number of agents, including nerve agents, mustard agents, and toxic industrial chemicals. They also maintain the capabilities of Level 2 laboratories.
- *Level 2 laboratories* test for a limited number of toxic chemical agents. They also maintain the capabilities of Level 3 laboratories.
- *Level 3 laboratories* work with hospitals and other first responders to maintain competency in clinical specimen collection, storage, and shipment.

In 2010, a total of 57 LRN laboratories in the United States could handle and/or test for chemical agents; 10 of these were Level 1 laboratories, 36 were Level 2 laboratories, and 11 were Level 3 laboratories. Illinois reported downgrading its Level 2 laboratory to a Level 3 that year due to funding issues, and Florida reported adding a Level 3 laboratory during that same time period.

CDC conducts annual proficiency testing for Level 1 and Level 2 chemical laboratories to

determine their abilities to use core and additional methods to rapidly detect and measure chemical agents that can cause severe health effects. These methods are considered important because they can help determine the scope of a real incident, identify those requiring long-term treatment, assist with non-emergency medical guidance, and help law enforcement officials determine the origin of the chemical agent. The core methods are significant as they offer new technical fundamentals in the methods that provide the foundation of LRN-C laboratory capabilities. The number of core methods increased from six in 2009 to eight in 2010.

The majority of LRN laboratories undergo proficiency testing in additional methods as well. These methods build upon the foundation established by the core methods, providing modifications to core techniques that allow for laboratories to test for additional agents and thereby expand their testing capabilities. Proficiency in additional methods is required for Level 1 laboratories and optional for Level 2 laboratories. In 2009, there were six additional methods for Level 1 laboratories and up to five additional methods for Level 2 laboratories, depending on the state or locality needs. In 2010, there were five additional methods in which Level 1 laboratories should have demonstrated proficiency, and up to four additional methods in which Level 2 laboratories could have chosen to become proficient.

Illinois reported downgrading its Level 2 laboratory to Level 3 in 2010 due to funding issues.

Table 3: Evaluating LRN-C Capabilities Through Proficiency Testing; 2009-2010

| Methods successfully demonstrated by Level 1 and Level 2 laboratories to rapidly detect chemical agents  |  |
|--|--|
| 2009   | 2010   |
| <p><b>Average number of methods:</b><br/><b>6.7 total methods</b></p> <ul style="list-style-type: none"> <li>• 5.3 core methods (maximum: 6)</li> <li>• 1.4 additional methods (maximum: up to 6)</li> </ul> | <p><b>Average number of methods:</b><br/><b>8.9 total methods</b></p> <ul style="list-style-type: none"> <li>• 7.1 core methods (maximum: 8)</li> <li>• 1.7 additional methods (maximum: up to 5)</li> </ul> |

Source: CDC, ONDIEH (NCEH); 2009 data: 1/1/09-9/14/09; 2010 data: 1/1/10-12/31/10

**Level 1 and 2 laboratories increased their abilities to rapidly detect and quantify chemical agents.** The average total number of methods (including both core and additional methods) successfully demonstrated by Level 1 and Level 2 laboratories rose from 6.7 methods in 2009 to 8.9 methods in 2010 (Table 3) – an increase of more than 30% in two years. In 2010, 28 out of 46 Level 1 and/or Level 2 LRN chemical laboratories were able to demonstrate proficiency in all eight core methods. In 2010, 27 out of 46 Level 1 and/or Level 2 LRN chemical laboratories demonstrated proficiency in at least one additional method to rapidly detect chemical agents.

**Level 1 laboratories greatly reduced the amount of time needed to process large volumes of samples during a CDC exercise.**

The LRN Surge Capacity Exercise demonstrates the ability of each of the ten Level 1 laboratories to test and report on 500 samples (a total of 5000 samples) on a 24/7 basis. This exercise demonstrates the ability of our nation to respond to a large-scale chemical incident like the Tokyo sarin subway attack of 1995. The response time for the exercise is determined from the time the 500 samples are received to the time the last test result is reported to CDC. Between 2009 and 2010, the average hours to process and report on 500 samples by Level 1 laboratories during the LRN Surge Capacity Exercise decreased from 98 hours to 56 hours.



## National Snapshot of Laboratory Activities

A summary table of national-level data on laboratory activities in 2008, 2009, and 2010 appears below (Table 4). Note that these items represent available data for preparedness activities and do not fully represent all state and

locality laboratory efforts. For individual state and locality information in the area of laboratory activities, see individual fact sheets starting on page 20. See appendix 1 for an explanation of data points.

Table 4: National Snapshot of Laboratory Activities; 2008-2010

| Laboratories: Biological Capabilities   |   |                           |   |                           |   |   |
|---|---|---------------------------|---|---------------------------|---|---|
|   | 2008  |                           | 2009  |                           | 2010  |   |
| <b>Laboratory Response Network (LRN) reference and/or national laboratories that could test for biological agents</b><br><br>Source: CDC, OID (NCEZID); 2008 data: 9/30/08; 2009 data: 12/31/09; 2010 data: 12/31/10  | 151 total LRN reference and national laboratories |                           | 135 total LRN reference and national laboratories |                           | 142 total LRN reference and national laboratories |   |
|   | 148 LRN reference laboratories                    |                           | 132 LRN reference laboratories                    |                           | 139 LRN reference laboratories                    |   |
|   | 3 LRN national laboratories                       |                           | 3 LRN national laboratories                       |                           | 3 LRN national laboratories                       |   |
| <b>Proficiency tests passed by LRN reference and/or national laboratories</b><br><br>Source: CDC, OID (NCEZID); 2008 data: 1/08-9/08; 2009 data: 1/1/09-12/31/09; 2010 data: 1/1/10-12/31/10  | 261 out of 277 tests (94%)                        |                           | 195 out of 204 tests (96%)                        |                           | 312 out of 327 tests (95%)                        |   |
| <b>LRN laboratory ability to contact the CDC Emergency Operations Center within 2 hours during LRN notification drill</b><br><br>Note: One LRN laboratory in DC and in each state is eligible to participate in this drill, with the exception of CA, IL, and NY, where two can participate.<br><br>Source: CDC, OID (NCEZID); 2008 data: 3/08; 2009 data: 7/09; 2010 data: 4/10 and 6/10 | 39 out of 54 laboratories participated (72%)      |                           | 54 out of 54 laboratories participated (100%)     |                           | <b>Apr</b>  | <b>Jun</b>                                    |
|   | 35 out of 39 laboratories passed (90%)            |                           | 51 out of 54 laboratories passed (94%)            |                           | 44 out of 54 laboratories participated (81%)      | 54 out of 54 laboratories participated (100%) |
| <b>Number of states submitting at least 90% of test results to CDC's PulseNet database within 4 working days</b><br><br>Source: CDC, OPHPR (DSLRL); 2008 data: 8/31/07-8/9/08 (50 states); 2009 data: 8/10/08-8/9/09 (50 states and DC); 2010 data: 8/10/09-8/9/10 (50 states and DC)   | <i>Escherichia coli</i> O157:H7                   | 29 out of 50 states (58%) | <i>Escherichia coli</i> O157:H7                   | 32 out of 51 states (63%) | <i>Escherichia coli</i> O157:H7                   | 38 out of 50 states (76%)                     |
|   | <i>Listeria monocytogenes</i>                     | 18 out of 32 states (56%) | <i>Listeria monocytogenes</i>                     | 18 out of 28 states (64%) | <i>Listeria monocytogenes</i>                     | 21 out of 31 states (68%)                     |

| Laboratories: Chemical Capabilities   |   |   |     |  |  |  |     |  |
|---|---|---|-----|--|--|--|-----|--|
|   | 2009  | 2010  |     |  |  |  |     |  |
| <p><b>LRN-C laboratories with capabilities for responding if the public is exposed to chemical agents</b></p> <p>Source: CDC, ONDIEH (NCEH); 2009 data: 9/14/09; 2010 data: 12/31/10</p>  | <p><b>56</b> LRN-C laboratories:</p> <ul style="list-style-type: none"> <li>• <b>10 out of 56</b> were Level 1 laboratories</li> <li>• <b>37 out of 56</b> were Level 2 laboratories</li> <li>• <b>9 out of 56</b> were Level 3 laboratories</li> </ul>   | <p><b>57</b> LRN-C laboratories:</p> <ul style="list-style-type: none"> <li>• <b>10 out of 57</b> were Level 1 laboratories</li> <li>• <b>36 out of 57</b> were Level 2 laboratories</li> <li>• <b>11 out of 57</b> were Level 3 laboratories</li> </ul>  |     |  |  |  |     |  |
| <p><b>Methods successfully demonstrated by Level 1 and/or Level 2 laboratories to rapidly detect chemical agents during proficiency testing</b></p> <p>Source: CDC, ONDIEH (NCEH); 2009 data: 1/1/09-9/14/09; 2010 data: 1/1/10-12/31/10</p>  | <p><b>Average number of methods:</b></p> <ul style="list-style-type: none"> <li>• <b>6.7</b> total methods</li> <li>• <b>5.3</b> core methods</li> <li>• <b>1.4</b> additional methods</li> </ul> <p><b>34 out of 47</b> Level 1 and/or Level 2 laboratories successfully demonstrated all six core methods (72%)</p> <p><b>26 out of 47</b> Level 1 and/or Level 2 laboratories successfully demonstrated at least one additional method (55%)</p>                                   | <p><b>Average number of methods:</b></p> <ul style="list-style-type: none"> <li>• <b>8.9</b> total methods</li> <li>• <b>7.1</b> core methods</li> <li>• <b>1.7</b> additional methods</li> </ul> <p><b>28 out of 46</b> Level 1 and/or Level 2 laboratories successfully demonstrated all eight core methods (61%)</p> <p><b>27 out of 46</b> Level 1 and/or Level 2 laboratories successfully demonstrated at least one additional method (59%)</p> |     |  |  |  |     |  |
| <p><b>LRN-C laboratories ability to collect, package, and ship samples properly during LRN exercise</b></p> <p>Source: CDC, ONDIEH (NCEH); 2009 data: 2/10/09-11/9/09; 2010 data: 1/1/10-12/31/10</p>   | <ul style="list-style-type: none"> <li>• <b>53 out of 56</b> laboratories participated (95%)</li> <li>• <b>49 out of 53</b> laboratories passed (92%)</li> </ul>  | <ul style="list-style-type: none"> <li>• <b>56 out of 57</b> laboratories participated (98%)</li> <li>• <b>56 out of 56</b> laboratories passed (100%)</li> </ul>   |     |  |  |  |     |  |
| <p><b>Number of chemical agents detected by Level 1 and/or Level 2 laboratories during the LRN Emergency Response Pop Proficiency Test (PopPT) exercise</b></p> <p><b>Note: Not all Level 1 and Level 2 laboratories were eligible to participate in this exercise</b></p> <p>Source: CDC, ONDIEH (NCEH); 2009 data: 8/24/09 and 10/05/09; 2010 data: 9/13/10</p> | <table border="1"> <thead> <tr> <th>Aug</th> <th>Oct</th> </tr> </thead> <tbody> <tr> <td> <p><b>589 out of 658</b> agents (90%)</p> <p>Note: A total of 14 agents per laboratory could have been detected by the 47 laboratories participating in this exercise.</p> </td> <td> <p><b>31 out of 32</b> agents (97%)</p> <p>Note: A total of 1 agent per laboratory could have been detected by the 32 laboratories participating in this exercise.</p> </td> </tr> </tbody> </table> | Aug   | Oct | <p><b>589 out of 658</b> agents (90%)</p> <p>Note: A total of 14 agents per laboratory could have been detected by the 47 laboratories participating in this exercise.</p> | <p><b>31 out of 32</b> agents (97%)</p> <p>Note: A total of 1 agent per laboratory could have been detected by the 32 laboratories participating in this exercise.</p> | <table border="1"> <thead> <tr> <th>Sep</th> </tr> </thead> <tbody> <tr> <td> <p><b>664 out of 731</b> agents (91%)</p> <p>Note: A total of 17 agents per laboratory could have been detected by the 43 laboratories participating in this exercise.</p> </td> </tr> </tbody> </table> | Sep | <p><b>664 out of 731</b> agents (91%)</p> <p>Note: A total of 17 agents per laboratory could have been detected by the 43 laboratories participating in this exercise.</p> |
| Aug   | Oct   |   |     |  |  |  |     |  |
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| Sep   |   |   |     |  |  |  |     |  |
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| <p><b>Average hours to process and report on 500 samples by Level 1 laboratories during the LRN Surge Capacity Exercise</b></p> <p>Source: CDC, ONDIEH (NCEH); 2009 data: 1/13/09-1/18/09; 2010 data: 5/18/10-5/22/10</p>   | <p><b>98</b> hours (range was 71 to 126 hours)</p>  | <p><b>56</b> hours (range was 38 to 86 hours)</p>   |     |  |  |  |     |  |

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