



The Laboratory Response Network



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What Is the LRN?

A Diverse Laboratory Network

National network of local, state and federal public health, hospital-based, food testing, veterinary and environmental testing laboratories that provide laboratory diagnostics and the capacity to respond to biological and chemical threats and other public health emergencies.

Multi-agency collaboration

The LRN is a partnership involving key stakeholders in the preparation and response to biological and chemical threats. The Centers for Disease Control and Prevention (CDC) in conjunction with , Federal Bureau of Investigation (FBI), and Association of Public Health Laboratories are founding partners .



LRN Structure for Bioterrorism



LRN Mission

The LRN and its partners will develop, maintain and strengthen an integrated national and international network of laboratories that can respond quickly to needs for rapid testing, timely notification and secure reporting of results associated with acts of biological or chemical terrorism and other high priority public health emergencies (October 2005).

Our Mission in Action

Bioterrorism Preparedness

- Timely detection of *Bacillus anthracis* during anthrax attacks in 2001
- BioWatch

Public Health Emergency Response

- Deployed rapid tests for detection of Severe Acute Respiratory Syndrome
- Monkeypox



LRN Mission In Action



- LRN Mission in Action

Bioterrorism Preparedness

- Timely detection of *Bacillus anthracis* during anthrax attacks in 2001
- BioWatch
- Test support for U.S. Embassies located abroad
- In 2009, tested over 400 suspicious powders referred by the FBI and other
- law enforcement agencies

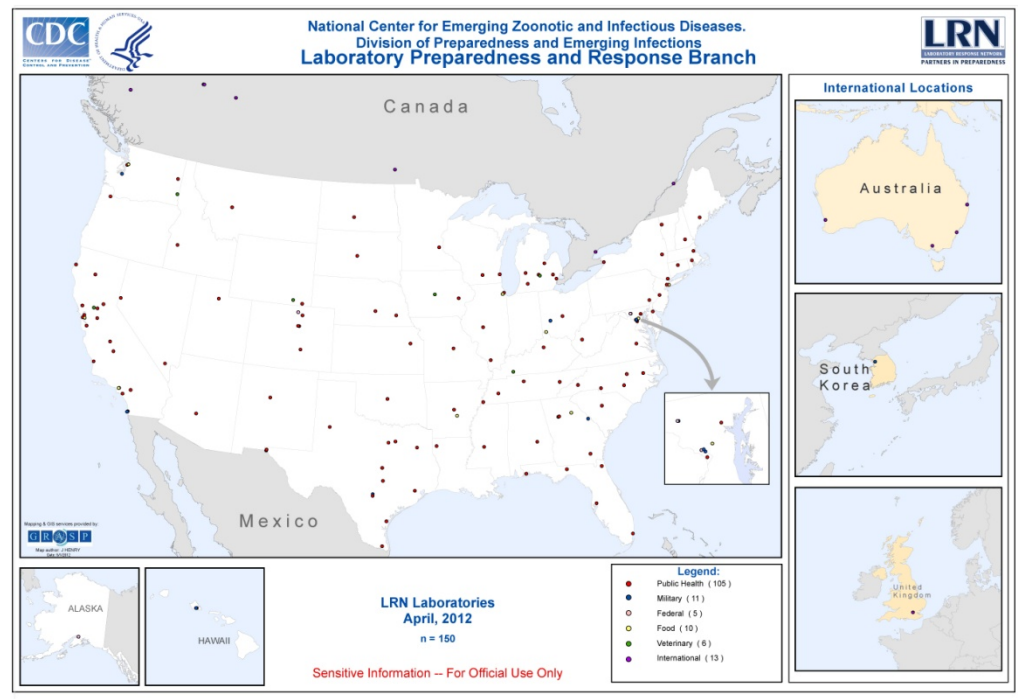
Public Health Emergency Response

- Deployed rapid tests developed at CDC for detection of Severe Acute Respiratory Syndrome
- Monkeypox outbreak in U.S. Midwest
- *E. coli* in spinach outbreak
- Deployment of influenza A/H5 (Asian lineage) virus assay
- *B. anthracis* detection in drum makers and performers in 2006 (NY),
- 2007 (CT), and 2009 (NH)

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The Laboratory Network



- 150+ federal, state, local, veterinary, and food labs in 50 states and abroad.
- National labs – CDC, military – perform definitive testing.
- Reference labs – BSL-3 labs capable of confirmatory testing for agents such as *B. anthracis*, and *C. botulinum* toxin.



Partnerships



Partners

- CDC
- Association of Public Health Laboratories
- Federal Bureau of Investigation



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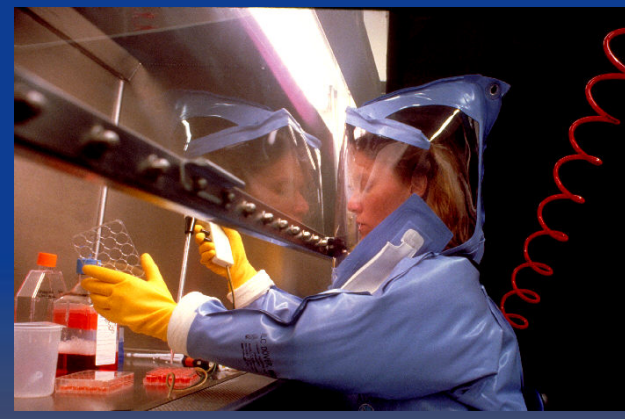
Partnerships Shape the Scope of the LRN

- **International Laboratories** – LRN membership includes labs in Australia , Canada, Mexico, United Kingdom, and South Korea.
- **Environmental** – LRN is working with EPA to build testing capacity for measuring biological and chemical agents in environmental samples.
- **Food and Water** – LRN includes food and water testing labs to guard against contamination
- **Veterinary labs** –The National Animal Health Laboratory Network through USDA's Animal and Plant Health Inspection Service (APHIS), and the American Association of Veterinary Laboratory Diagnosticians

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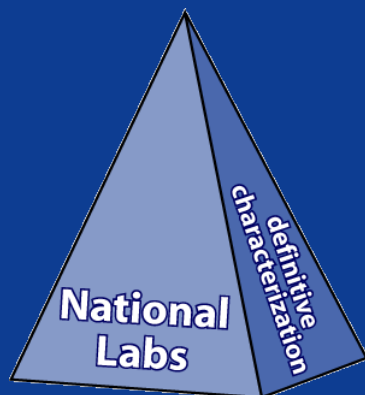
Structure for Bioterrorism Response



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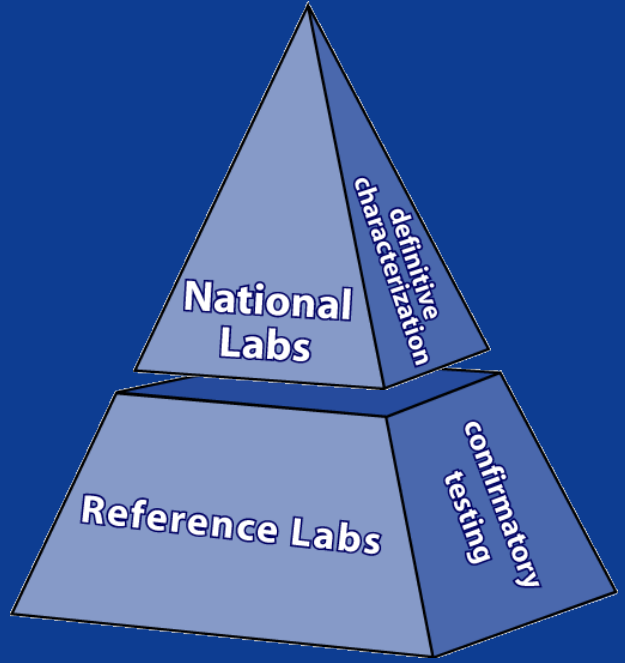
National Laboratories



National laboratories, including those operated by the CDC and the US Army Medical Research Institute of Infectious Diseases (USAMRIID), are responsible for specialized strain characterizations, bioforensics, select agent activity, and handling highly infectious biological agents and toxic chemicals.



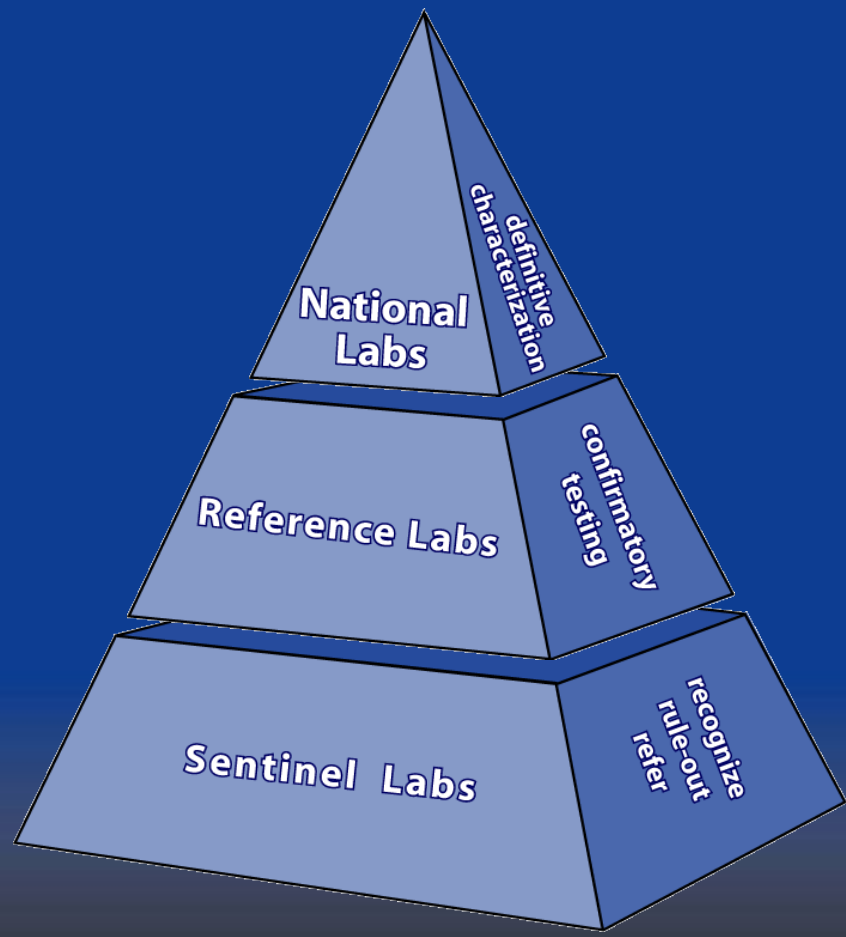
Reference Labs



Reference laboratories - responsible for investigation and/or referral of specimens --are made up of more than 100 state and local public health, military, federal, and international laboratories. Lab types include veterinary, agriculture, food and water testing laboratories. In addition to laboratories located in the U.S., facilities located in Australia, Canada, Mexico, South Korea, and the United Kingdom serve as reference laboratories abroad.



Sentinel Laboratories

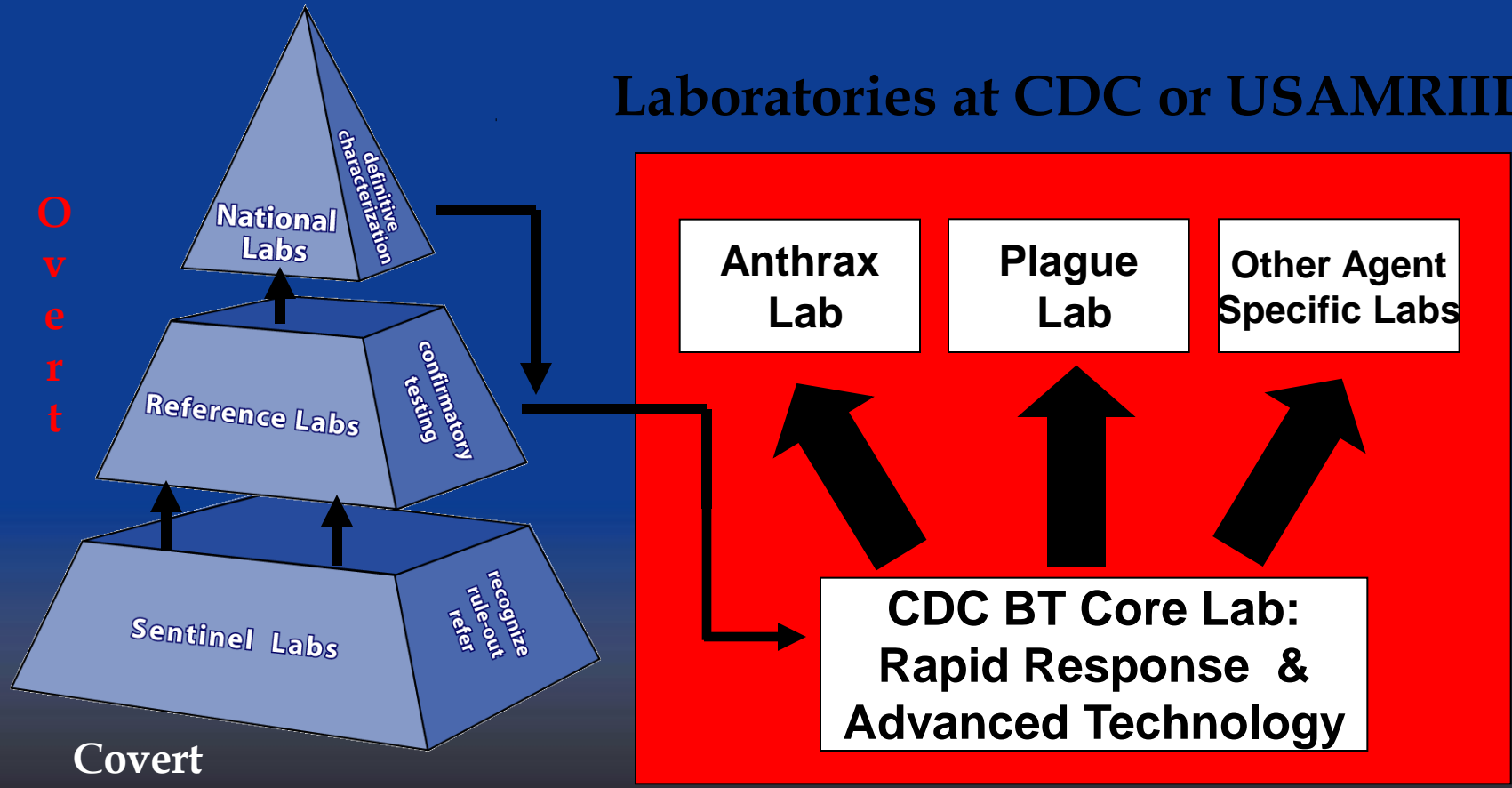


Sentinel laboratories provide routine diagnostic services, rule-out and referral steps in the identification process. Although these laboratories are not equipped to perform the same tests as LRN reference laboratories, they can test samples to determine whether those samples should be shipped to reference or national laboratories for further testing.



LRN Structure for Agent Testing & Sample Flow

Laboratories at CDC or USAMRIID



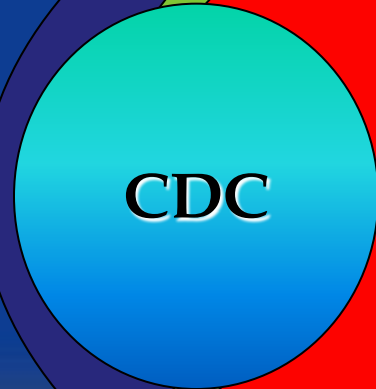


Structure for Chemical Terrorism Response

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Chemical Testing Capacity



Level 1

- 10 Labs
- Level 1, 2+ Level 3 activities
- National Surge Capacity
- Qualified for core and additional methods
- Redundant equipment resources
- Additional personnel

Level 2

- 37 Labs
- Level 3 Activities
- Qualified for core methods
- State/local response capacity

Level 3

- 12 Labs
- Competency in packaging and shipping clinical samples
- Comprehensive response plan



LRN Structure – Chemical Terrorism



- Includes 59 state, territorial, and metropolitan public health laboratories
- A designation of Level 1, 2, or 3 defines member network participation
- Every network member participates in Level 3 activities





LRN Structure – Chemical Terrorism



- Thirty-seven labs also participate in **Level 2 activities**; they are trained to detect exposure to a limited number of toxic chemical agents. Detection of toxic chemicals, such as cyanide or toxic metals, present in human specimens is an example of Level 2 laboratory analysis. Each lab must demonstrate competency in core methods.
- Twelve labs participate in **Level 3 activities**, and these laboratories are responsible for developing a coordinated response plan for their state and geographic region. They are responsible for providing guidance and training for clinical specimen collection, storage, and shipment.





LRN Structure – Chemical Terrorism



Ten laboratories participate in Level -1 activities; serving as surge capacity laboratories for CDC. They are able to detect human exposure to chemical warfare agents, including mustard agents, nerve agents, toxic industrial chemicals, such as cyanide.

These labs are able to utilize unique high- throughput analysis, to expand CDC's ability to rapidly analyze a large number of patient samples when responding to large scale exposure incidents; reducing the time needed to provide appropriate counter measures.





Preparing to Respond to a Chemical Event



CDC is assisting LRN Labs by

- Developing training curricula
- Transferring analytical methods
- Implementing a quality assurance program



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Rapid Toxic Screen

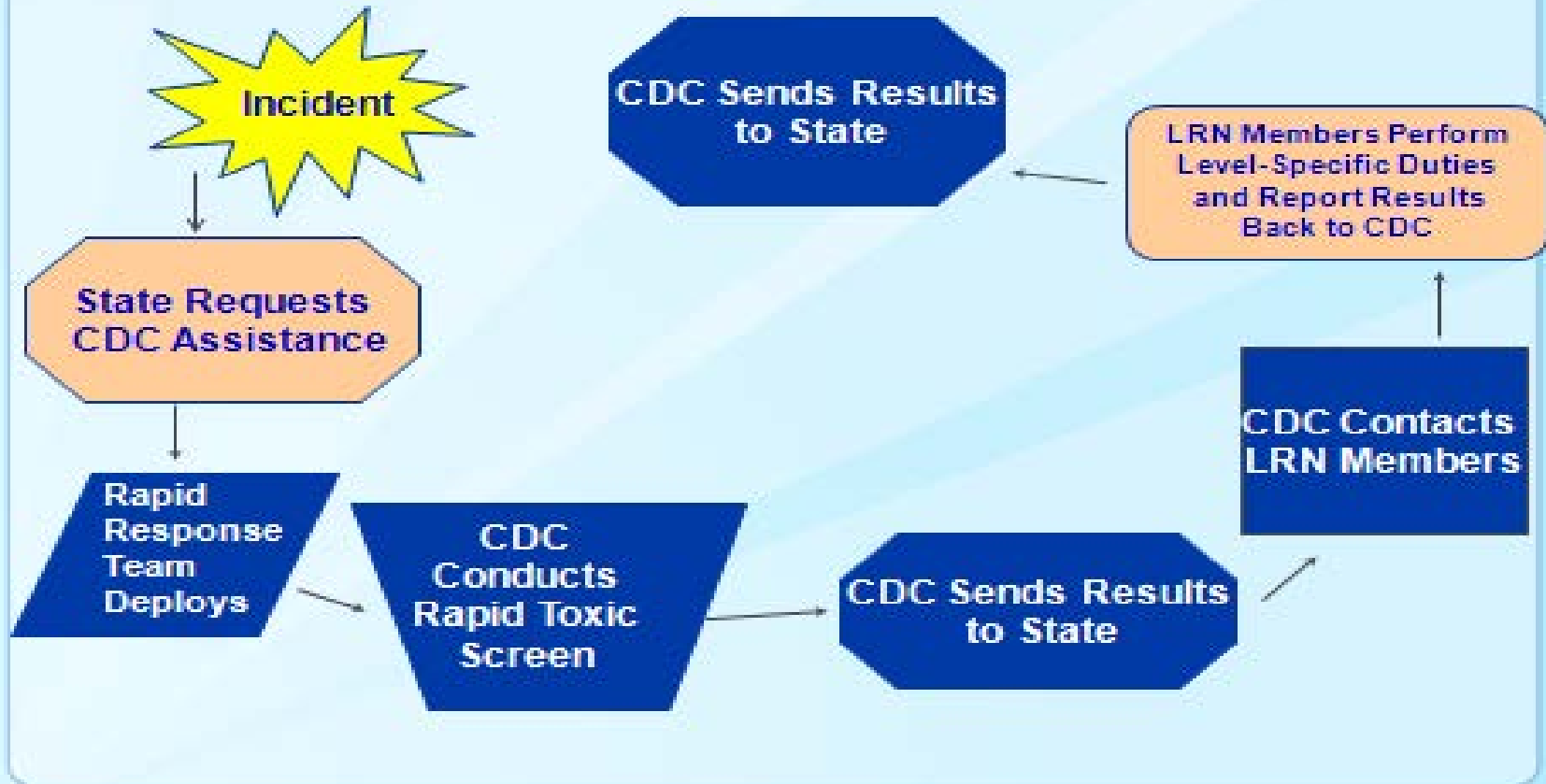
At the onset of an event, a state may request CDC's assistance. CDC will deploy a Rapid Response Team to the affected state to assist with specimen collection, packaging, storage, and shipment. The first 40 samples from people with symptoms are sent to CDC for analysis through the **Rapid Toxic Screen**, which can analyze people's blood and urine for a large number of chemical agents likely to be used by terrorists. Data produced from the Rapid Toxic Screen analysis will be communicated in a secure, electronic manner to the affected state or states.



Responding to a Chemical Event



Responding to a Chemical Event





Provided to Each LRN Lab

- Standardized Reagents & Controls
- Agent-Specific Protocols
- Lab Referral Directory
- Secure Communications
- Electronic Messaging
- Training & Technology Transfer
- Proficiency Testing
- Appropriate Vaccinations for Lab Workers


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Information Technology Support

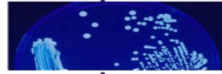


- Provides secure access for more than 2,000 LRN Lab workers
- Secure communications on emerging and emergency issues
- Order reagents
- View protocols for PCR and TRF assays
- Report and review proficiency tests
- Receive periodic updates regarding reagent availability, etc.

Laboratory Response Network for Chemical and Bioterrorism



Laboratory Response Network
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LRN Version 2.3.8



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Partners in All Facets of Biological & Chemical Terrorism Preparedness and Response

- American Association of Veterinary Laboratory Diagnosticians
- American Society for Microbiology
- Environmental Protection Agency
- U.S. Department of Agriculture
- U.S. Department of Defense
- U.S. Department of Energy
- U.S. Food and Drug Administration
- Department of Homeland Security
- College of American Pathologists

Founding Partners

- Association of Public Health Laboratories
- Federal Bureau of Investigation

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Ready to Respond

In the event of a terrorist act or other public health emergency, the LRN is poised to:

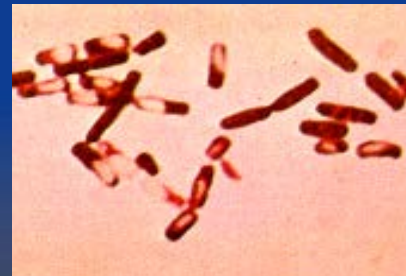
- Test thousands of clinical specimens and environmental samples using its multi-level network of state, food testing, clinical, veterinary, military, and federal labs.
- Coordinate laboratory response of CDC.
- Assist law enforcement agencies, public health, and others.
- Accept and transfer specimens to appropriate facilities, including the CDC where definitive testing can be done.
- Assure a rapid laboratory response to any public health emergency.

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LRN Formula for Success

- Unified operational plan
- Standardized protocols and tests
- Secure communications
- Molecular diagnostics
- Rapid response and reporting
- Safe, secure laboratories
- Trained laboratorians
- Coverage for human, animal, food, environmental specimens
- CDC coordinated support and oversight
- Quality laboratory results



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