The Laboratory Response Network: It's Role in Bioterrorism Preparedness and Response

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CDC

National partnership network to develop integrated laboratory solutions to protect the nation and enhance threat agent detection capacity for response to an act of biological or chemical terrorism and other public health emergencies

CDC

LRN Vision

Establish an integrated multilevel laboratory network to provide rapid & critical laboratory capacity for response to:

- **bioterrorism**
- **emerging infectious diseases**
- **other public health threats & emergencies**

Includes both biological & chemical laboratories

CDC

Challenge

Congressional concern for national security and critical infrastructure to respond to Weapons of Mass Destruction associated with biological and chemical warfare programs and the dissolution of the Soviet Union

CDC

Overt Event

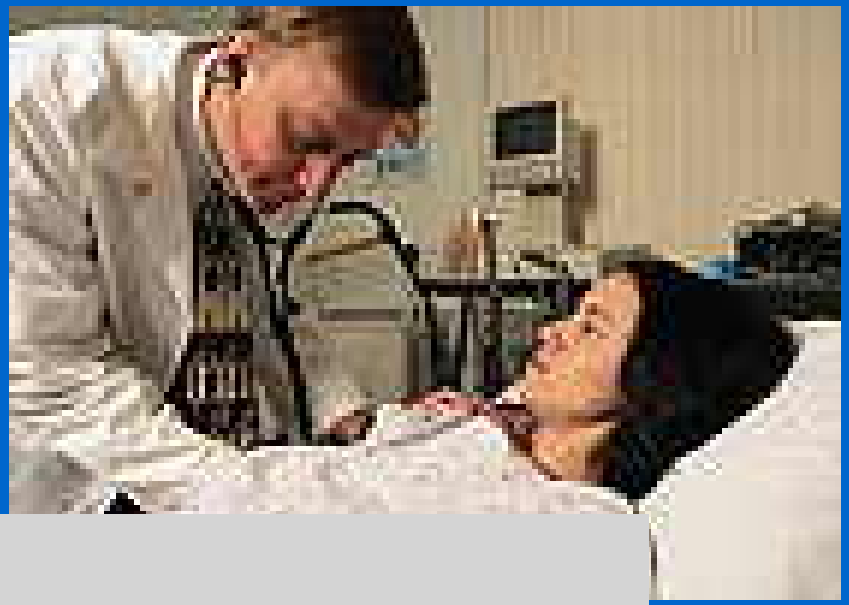
Recognition	Early
Response	Early
Treatment	Early
Responders	Traditional HazMat
	First Responders

Covert Event

Recognition	Delayed
Response	Delayed
Treatment	Delayed
Responders	Health Care Workers

CDC

Front Line Response Begins at the Local Level



CDC

Mission

Laboratory Response Network began in 1999

To **develop** an immediate **solution** to build **capability** and enhance **capacity** to **rapidly detect threat agents** in both announced and unannounced threat agent release scenarios

CDC

CDC Strategic Plan (1999)

The Laboratory Response Network for Bioterrorism (LRN) is a multi-level system designed to link front-line clinical microbiology laboratories in hospitals and other institutions to state and local public health laboratories and supporting advanced capacity public health, military, veterinary, agricultural, water and food-testing laboratories at the federal government level

CDC

LRN Founding Partners

- Centers for Disease Control and Prevention
- Association of Public Health Laboratories
- The Federal Bureau of Investigation

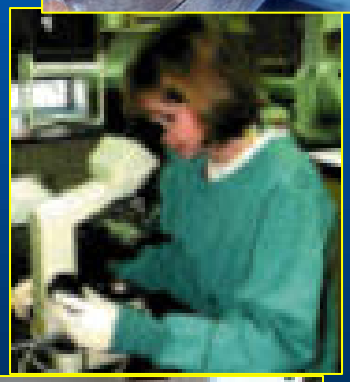
CDC

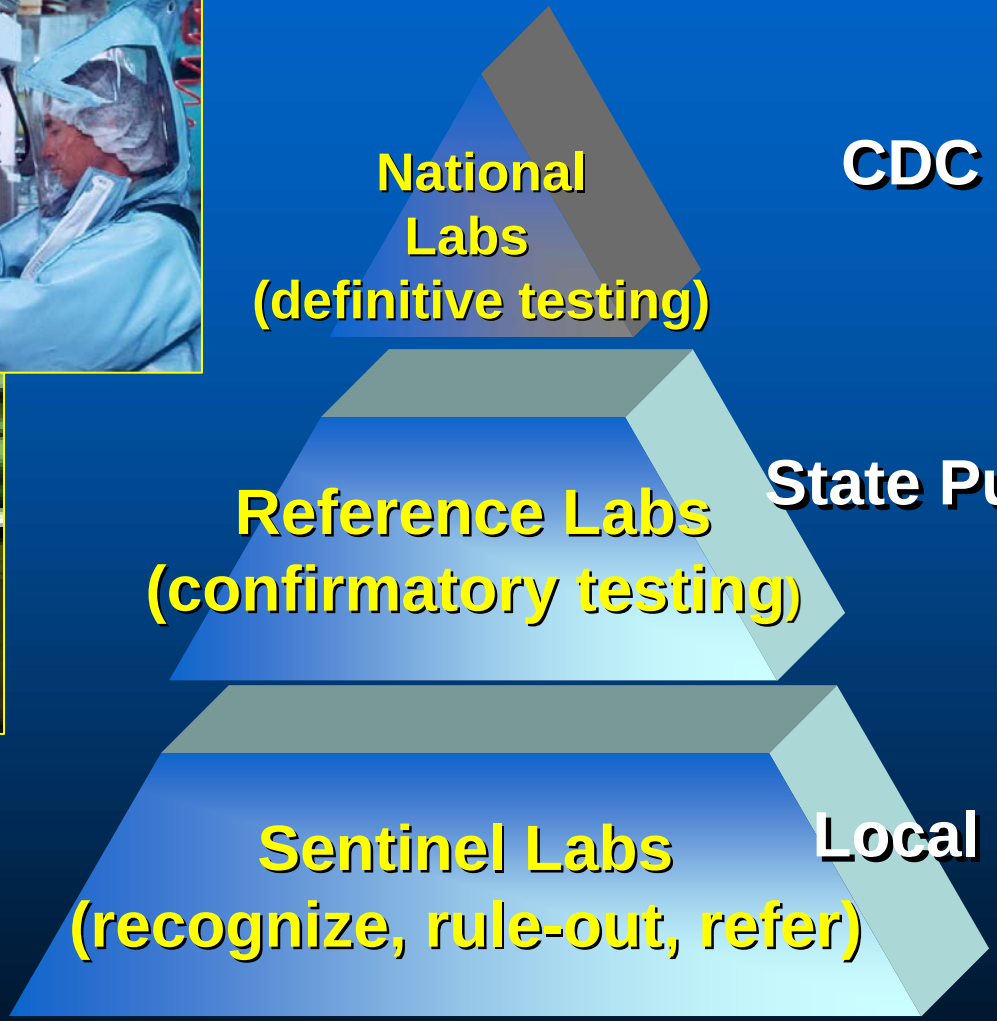
LRN Partnerships

- Clinical Labs
- State & Local Public Health Labs
- Military Labs
- Veterinary Labs
- Agricultural, Water & Food-Testing Labs
- APHL & ASM
- FDA, NIH, & International Labs
- FBI, DoD, DOE, USDA, EPA

CDC

Current LRN Lab Designations





CDC and USAMRIID

State Public Health Labs

Local Clinics, Hospitals

CDC

Scope of LRN Labs

Current LRN National labs =
2 (CDC & USAMRIID)

Projected LRN Reference labs =
250 nationally

Possible LRN Sentinel "state-registered" labs
> 2,500 nationally (4414 are Sentinel-capable)

NOTE: LRN reference laboratory status involves technical proficiency & select membership

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Laboratory Testing Required in Support of Response

- Environmental samples for risk assessment
- Nasal swabs for epidemiological investigations
- Clinical specimens for detecting exposure and infection
- Culture isolates referred for confirmation

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Time to Results

Real-time PCR

TRF Immuno-assay

DFA

Bacterial Culture

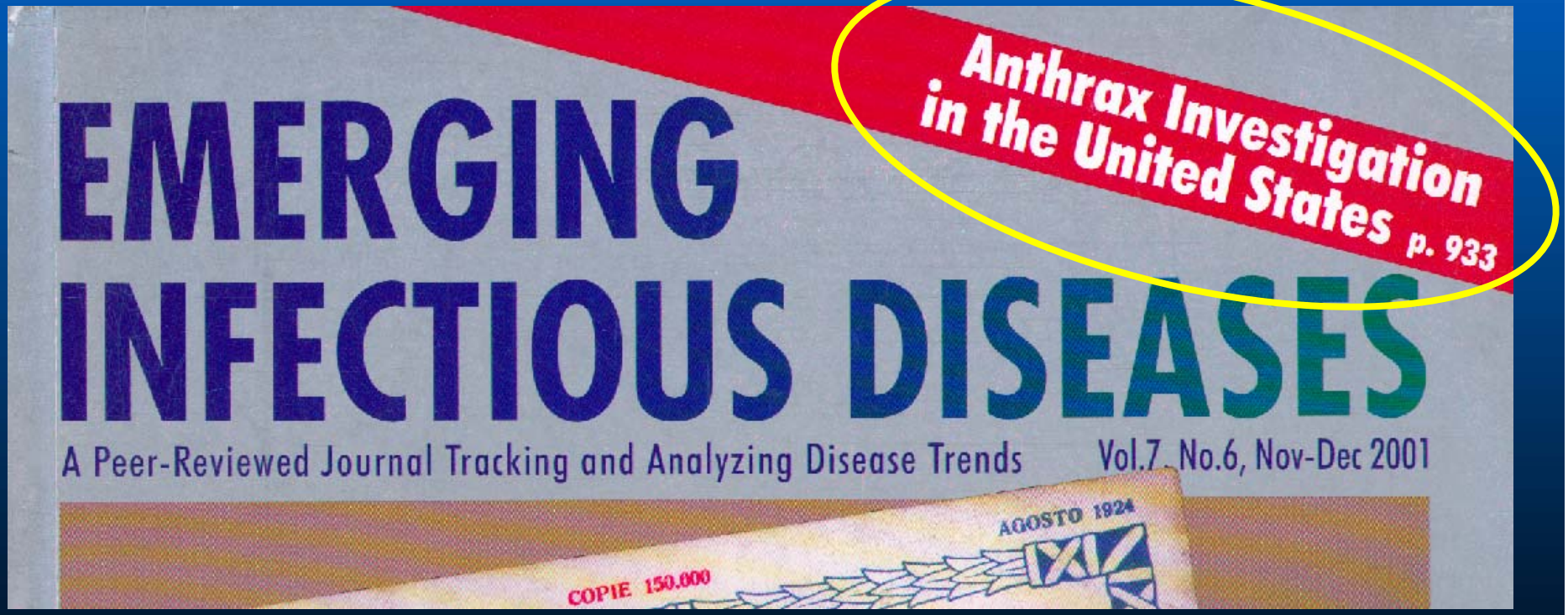
Viral Culture

0 1 2 3 24 48 72

TIME (hours)

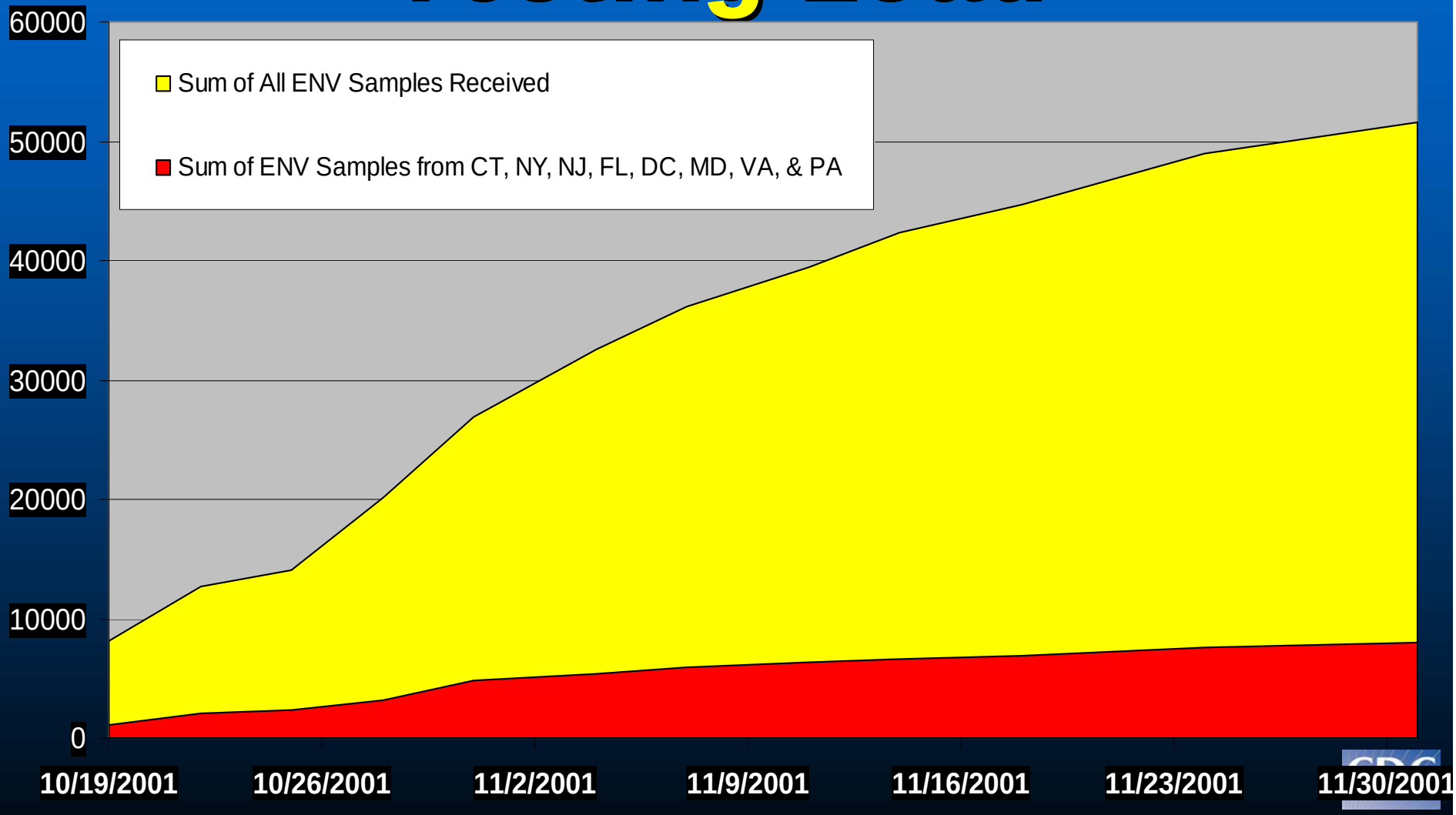
CDC

The LRN Responds to Anthrax Attack in USA



CDC

LRN Environmental Testing Load

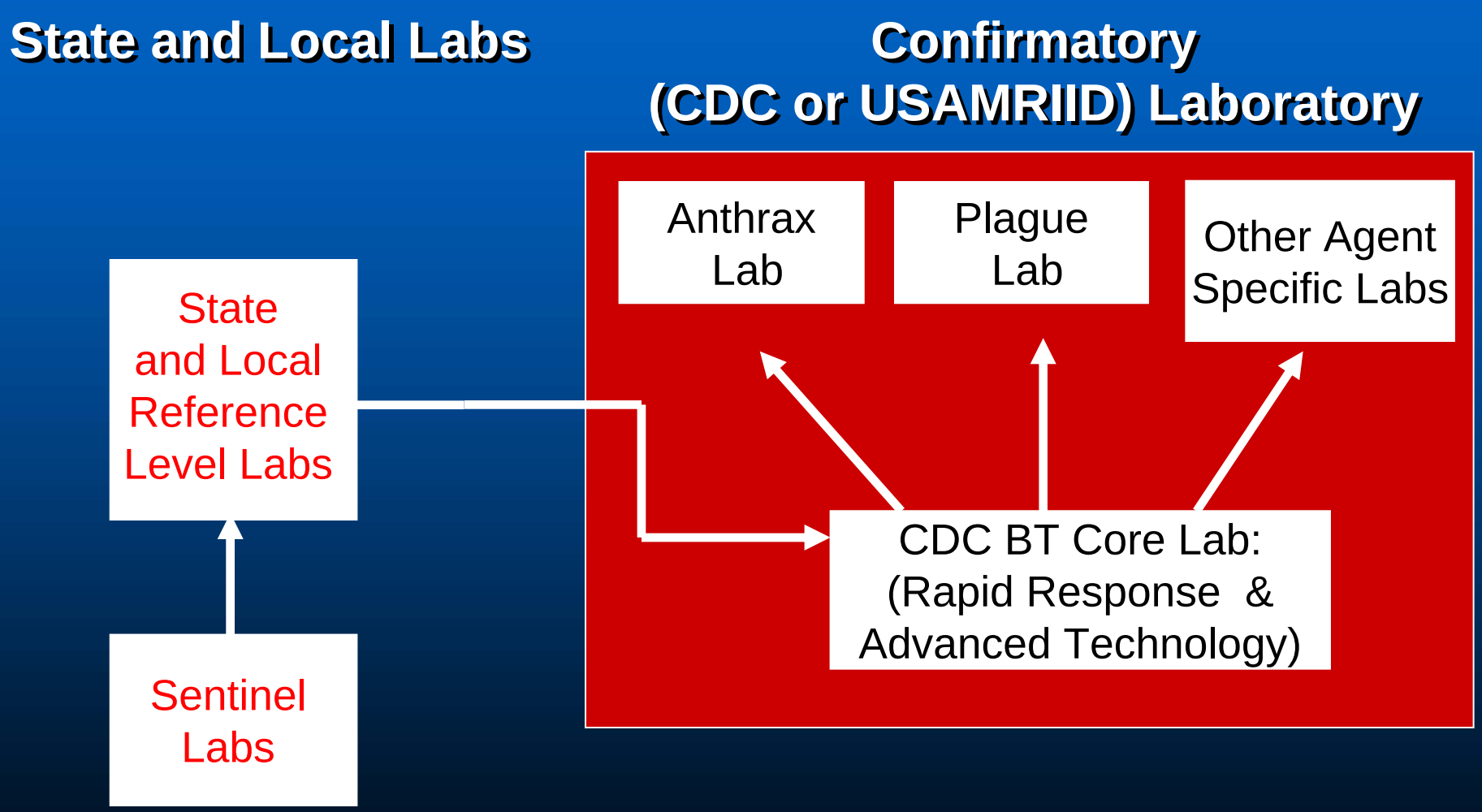


CDC Bioterrorism Rapid Response and Advanced Technology Laboratory "the RRAT lab"

- Develop and expand network capacity for rapid identification of critical agents (technology transfer)
- Validate assays and standardize reagents
- Develop rapid biological screens (multiplex)
- Triage, screen and test "unknown" specimens
- Provide proficiency testing program
- Provide initial rapid response support to States

CDC

LRN Structure for Agent Testing & Sample Flow



Provided to Each LRN Lab

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

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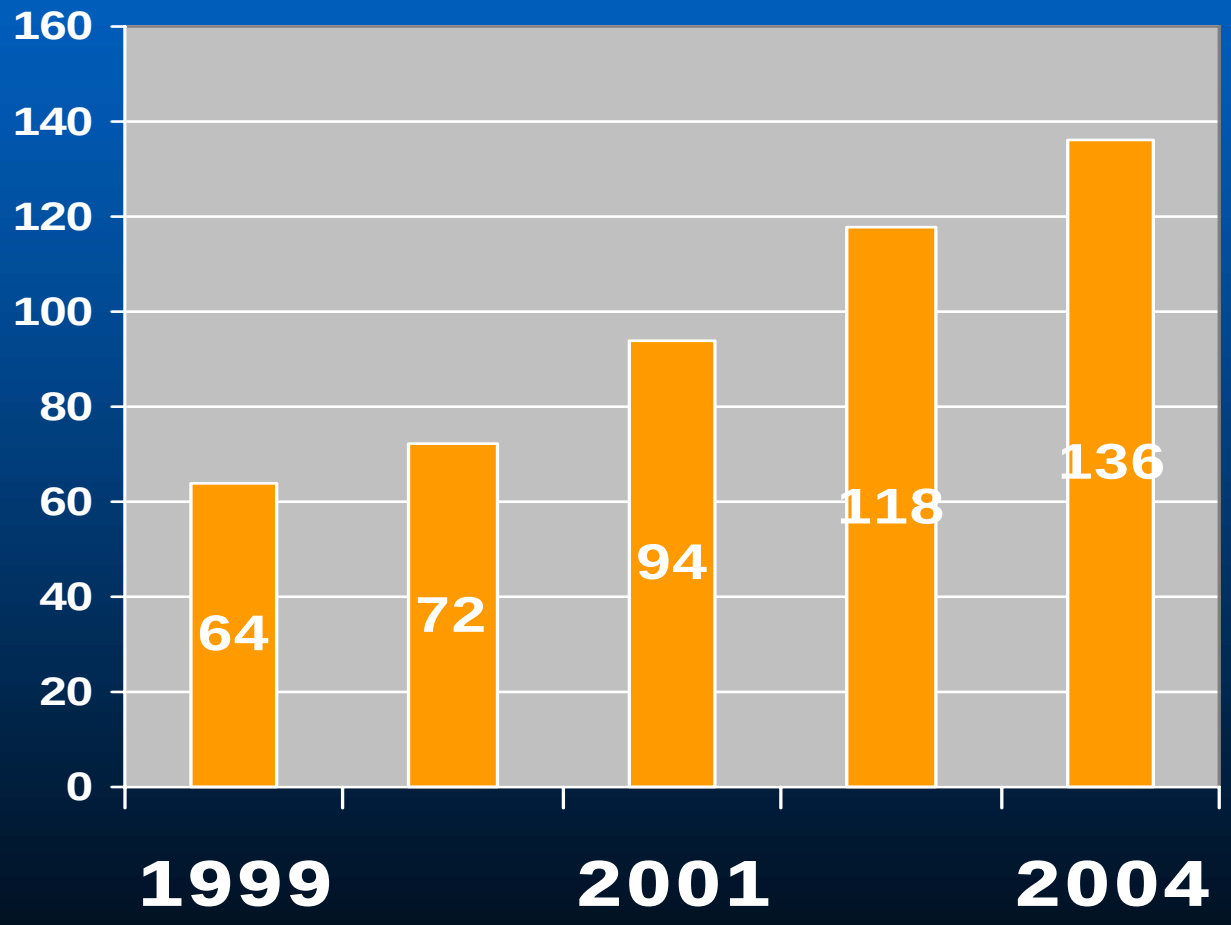
Number of LRN Labs - Growth Over Time



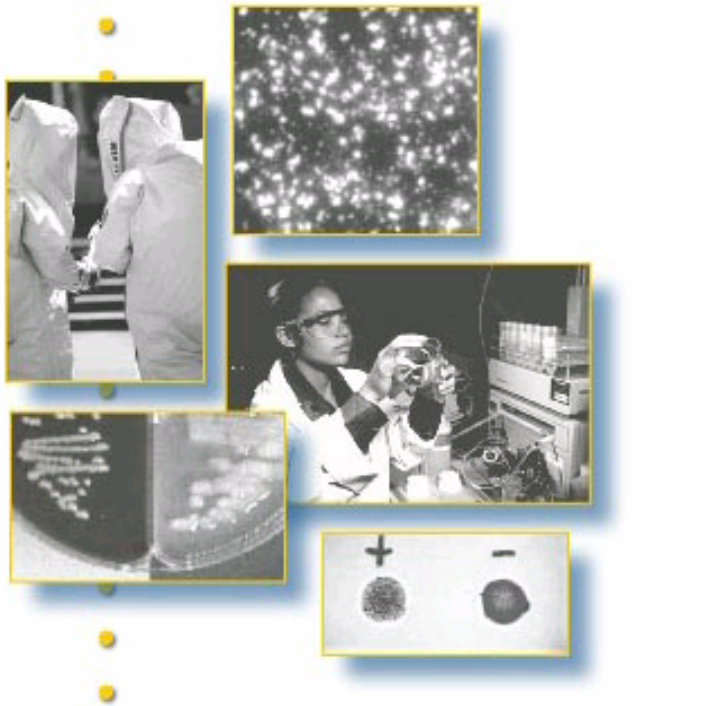
LRN Secure Web Site

APHL/CDC

BT Lab Guidance and Reagent Ordering

Logon | Registration | Feedback | APHL Home Page

BT Lab Guidance and Reagent Ordering System



Welcome to the **BT Lab Guidance and Reagent Ordering System**. First time users of the system should register using the **User Registration** form. Registered users may access the system by entering their User ID and Password below.

This system allows authorized laboratory users to view Agent Protocol Guidance Manuals and order the Reagents discussed in the manuals.

Your ability to order a Reagent will depend on your laboratory's BT Security Level for that Agent and the BT security level assigned to the desired Reagent.

User Logon

User ID:

Password:

Logon | Reset

Did you **forget your password?**

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Laboratory Protocols

LABORATORY PROTOCOLS
FOR
BIOTERRORISM RESPONSE LABORATORIES
FOR THE IDENTIFICATION OF

Bacillus anthracis

Notice: Protocol subject to change
Last Updated: September 7, 1999

This protocol is designed to provide laboratories with techniques to identify microorganisms, in order to support hospital clinicians in their diagnosis of potential diseases.

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Test Reagent Ordering

LRN

Laboratory Response Network for Bioterrorism

Main Menu | Tutorial | Help | Feedback | Exit System

Anthrax - Order Reagent

Protocols

Anthrax | Plague | Tularemia | Brucellosis | Botulism

To order reagents, click on a disease name above.

To order Reagents, enter the quantity into the corresponding field and click the "Add" button.

Reagent	Info	Catalog #	Level	Unit	Tests/Unit	Qty	Action
Gamma Phage Stock Suspension	Details	BP3123	B	.5ml/vial	50		Add
B.anthracis pasteur avirulent positive control strain	Details	BC3132	B	1.0ml/vial	~10		Add
B.cereus negative control strain	Details	BC3133	B	1.0ml/vial	~10		Add
B.thuringiensis negative control strain	Details	*BC3134*	*B*		*~10*	*-NA-*	*Item Unavailable*
B.anthracis DFA Conjugate for Vegetative Cell Capsule Antigen	Details	BG3124	B	50mcg/ml/vial	100 rxns		Add
B.anthracis DFA Conjugate for Vegetative Cell Wall Polysaccharide	Details	BG3125	B	50mcg/ml/vial	100 rxns		Add

Main Menu | Tutorial | Help | Feedback | Exit System

Next Nearest Neighbor Laboratory Facility Locator

LRN

Laboratory Response Network for Bioterrorism

Main Menu | Tutorial | Help | Feedback | Exit System

Lab Search Results

Lab Search Origin: Atlanta, GA 30333
Search Radius: 50 miles

Please call contact person listed to verify lab address and to discuss situation.
Click on "New Search" to select different search criteria for your report, or click "Done" to return to the main menu.

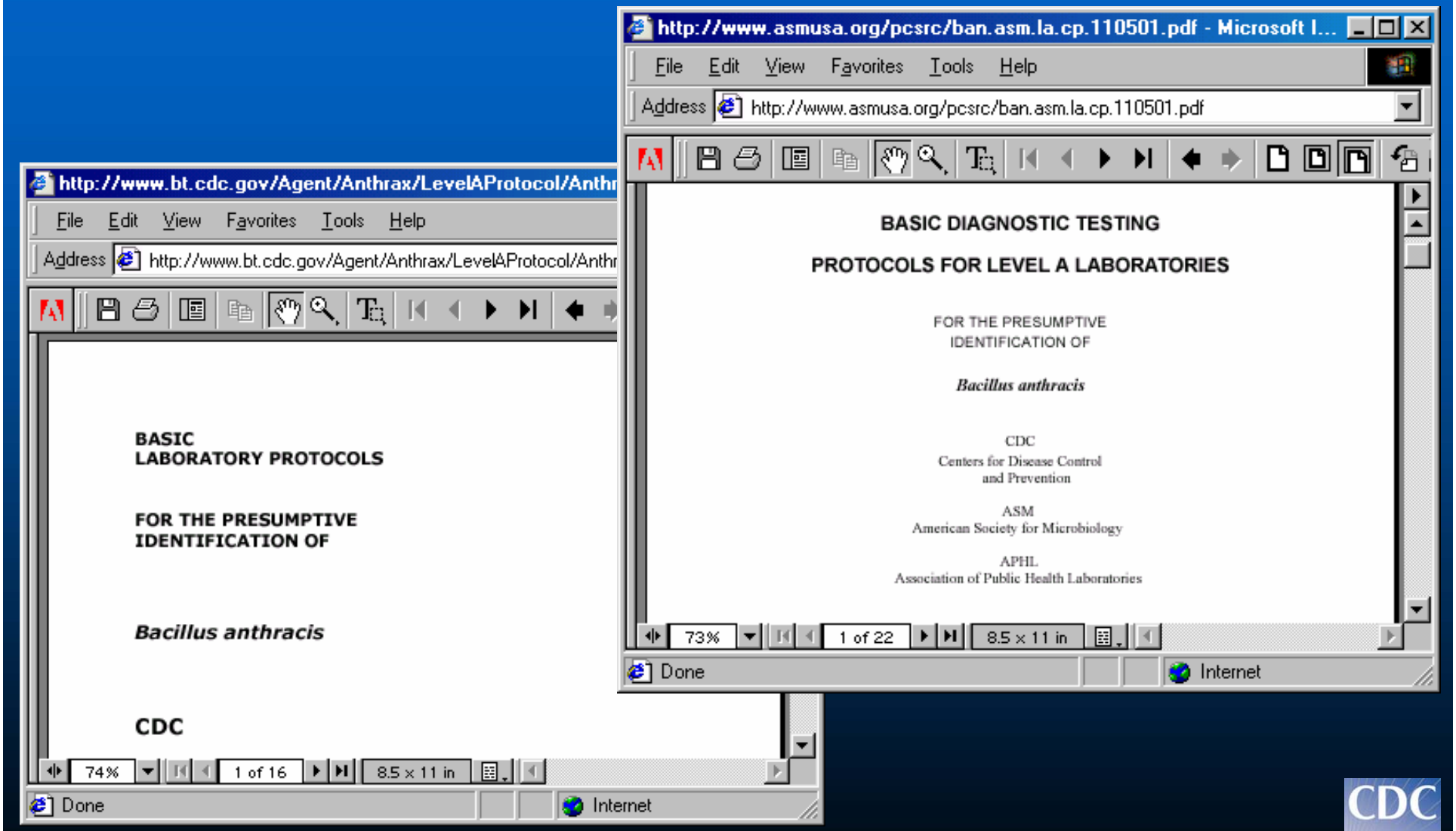
Lab Name	Contact Name (Title)	Address	Phone	Distance from Origin	BT Lab Level for "Anthrax"
Georgia - Decatur	*MAHIN PARK (CLINICAL lAB SERVICE DIRECTOR)*	*1749 clairmont road Decatur, GA*	*(404)327-7905*	*2 mi.*	*B*
Georgia - Decatur	*Elizabeth Franko (Director)*	*1749 clairmont road Decatur, GA*	*(404)327-7900*	*2 mi.*	*B*
Georgia - Atlanta (CDC BPRLS)	**Stephen Morse** (Deputy Director for Laboratory Services)	Lab Services Branch (BPRP/NCID) 1600 Clifton Road N.E. Atlanta, GA	(404)639-3559	**0 mi.**	**C**
Georgia - Atlanta (CDC BPRLS)	**Richard Kellogg** (Interagency Liaison & Intramural Lab Coordinator, Lab Services, BPRA)	Lab Services Branch (BPRP/NCID) 1600 Clifton Road N.E. Atlanta, GA	(404)639-0392	**0 mi.**	**C**

New Search | Done

⚠ *Lab listed in grey indicates state or territorial public health laboratory for zip code of origin.*

Main Menu | Tutorial | Help | Feedback | Exit System

Public Access Information for Level A Network Users



Laboratory Preparedness and Response Capacity Through Training

- Reference Level Wet Lab ("Hands On") Courses to train the trainers on specialized and rapid methods (at CDC)
- Sentinel Laboratory Protocols and training materials available for public access at *www.bt.cdc.gov* (based on standard methods)
- Proficiency Testing Program to certify lab readiness

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Recent Capability Additions

- Variola (Smallpox) Screening Laboratories (CDC/LRN Partner Labs)
- Food Emergency Response Network (FDA/USDA/LRN Partner Labs)
- Rapid Toxic Screening for Chemicals in Clinical Specimens (CDC/LRN Partner Labs)
- Environmental Surveillance/Bio-Watch (DHS/DOE/EPA/LRN Partner Labs)

CDC

Capabilities in Development

- Improved Environmental Sampling and Testing Methods (EPA/CDC)
- Incorporation of Veterinary Diagnostic Laboratories for Surge Testing Capacity (APHIS/AAVLD/CDC)
- Development of Self-Contained Modular Specimen Triage Units for Processing and Screening of Unknown Samples for CBR Hazards (CDC/FBI/DOD)

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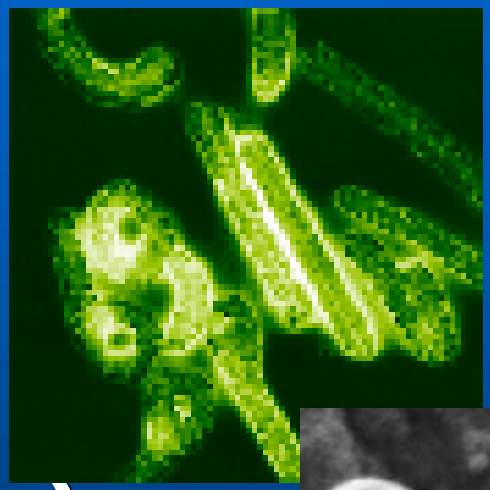
LRN Capacity Since 1999

- *B. anthracis* (Anthrax)
- *Y. pestis* (Plague)
- *F. tularensis* (Tularemia)
- *Brucella* species (Brucellosis)
- *Clostridium botulinum* toxin
- *Variola major* (Smallpox)



LRN Future Challenges

- Filoviruses Ebola and Marburg (VHFs)
- Arenaviruses (Lassa Fever and Junin)
- Alphaviruses (VEE, EEE, WEE)
- *Coxiella burnetii* (Q Fever)
- Ricin Toxin
- *Burkholderia mallei* (Glanders)
- Staphylococcal Enterotoxin B

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LRN Future Plans

- Laboratory worker vaccinations
- Diagnostics for VZV, vaccinia, variola
- Electronic laboratory reporting
- Emergency food testing network with FDA
- New protocols and training
- Integration with chemical network
- New technology evaluations
- GMP reagent production

CDC

Bioterrorism Agents and Biosafety in LRN Laboratories

Agent	Biosafety Level	Laboratory Risk
B. anthracis	2	low
Y. pestis	2	medium
F. tularensis	2 / 3	high
Brucella spp.	2 / 3	high
Botulinum toxin	2	medium
Smallpox	4	high
Viral Hemorrhagic fever	4	high

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Definition of Biosafety

CDC

LRN Reference Level Laboratory (Facility design)

Safety Equipment (Primary Barriers)

BSL-3: Additional Personal Protective Equipment (PPE) may be required in the laboratory based on risk assessment

- **Solid-front or wrap-around gowns**
- **Scrubs**
- **Coveralls**
- **Face shields**
- **Respirators**

CDC

Facility Summary for LRN Reference Laboratories
(BSL-3)

- Separate from unrestricted areas, access controlled
- Self-closing, double door entry
- Directional inward airflow
- Single-pass air*
- Enclosures for aerosol generating equipment
- Walls, floors and ceilings are water resistant for easy cleaning; Penetrations are sealed
- Autoclave available for decontamination

*Depending on agents used, a BSL-3 laboratory may require HEPA exhaust filtration

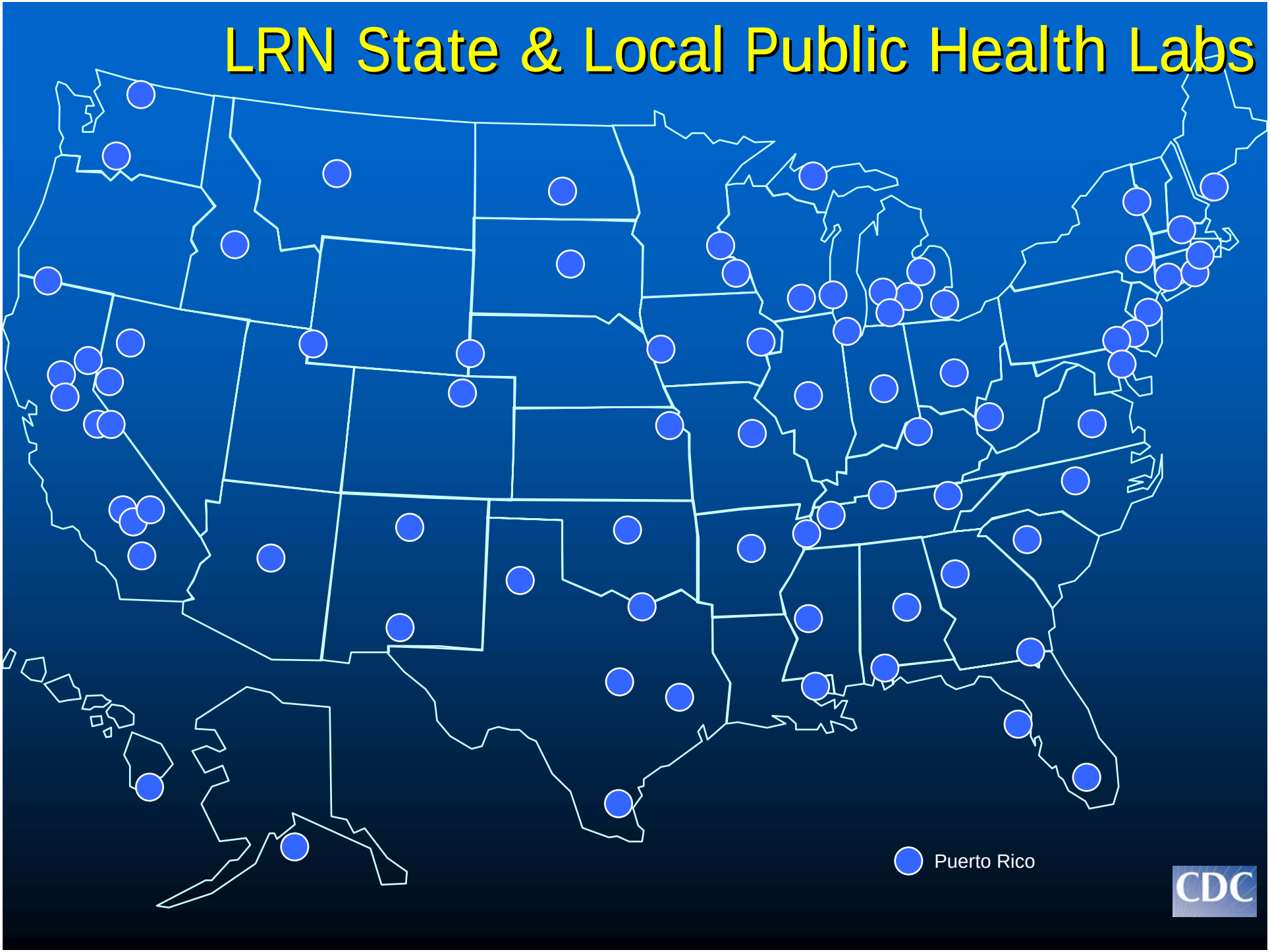
CDC

Laboratory Documentation

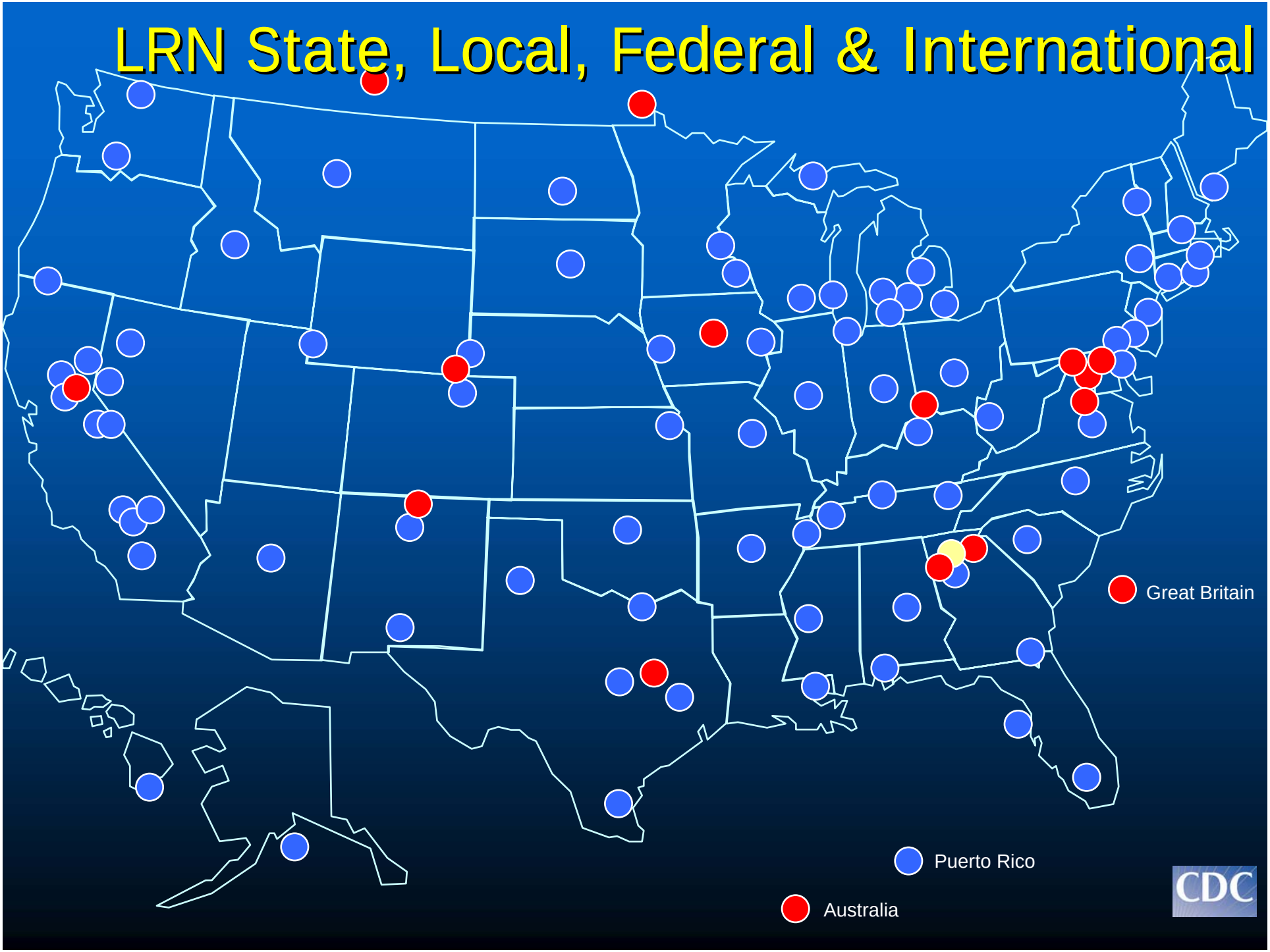
- **Facility Security Plan and Access Logs**
  - Based on risk assessment
  - Address access, visitors, maintenance personnel?
- **Laboratory Training Records**
  - Agent specific training?
  - How often performed?
- **Inventory Records**
  - How much on hand?
  - Depletion and usage?
  - How often reconciled?
- **Chemical Hygiene Plans for chemicals and toxins**
- **Transfer records**
  - Import permits
  - Interfacility EA-101s
  - Intrafacility records
- **Emergency response & Incident reporting procedures**
  - Security breaches, natural disasters, biological agent or toxin spills

CDC

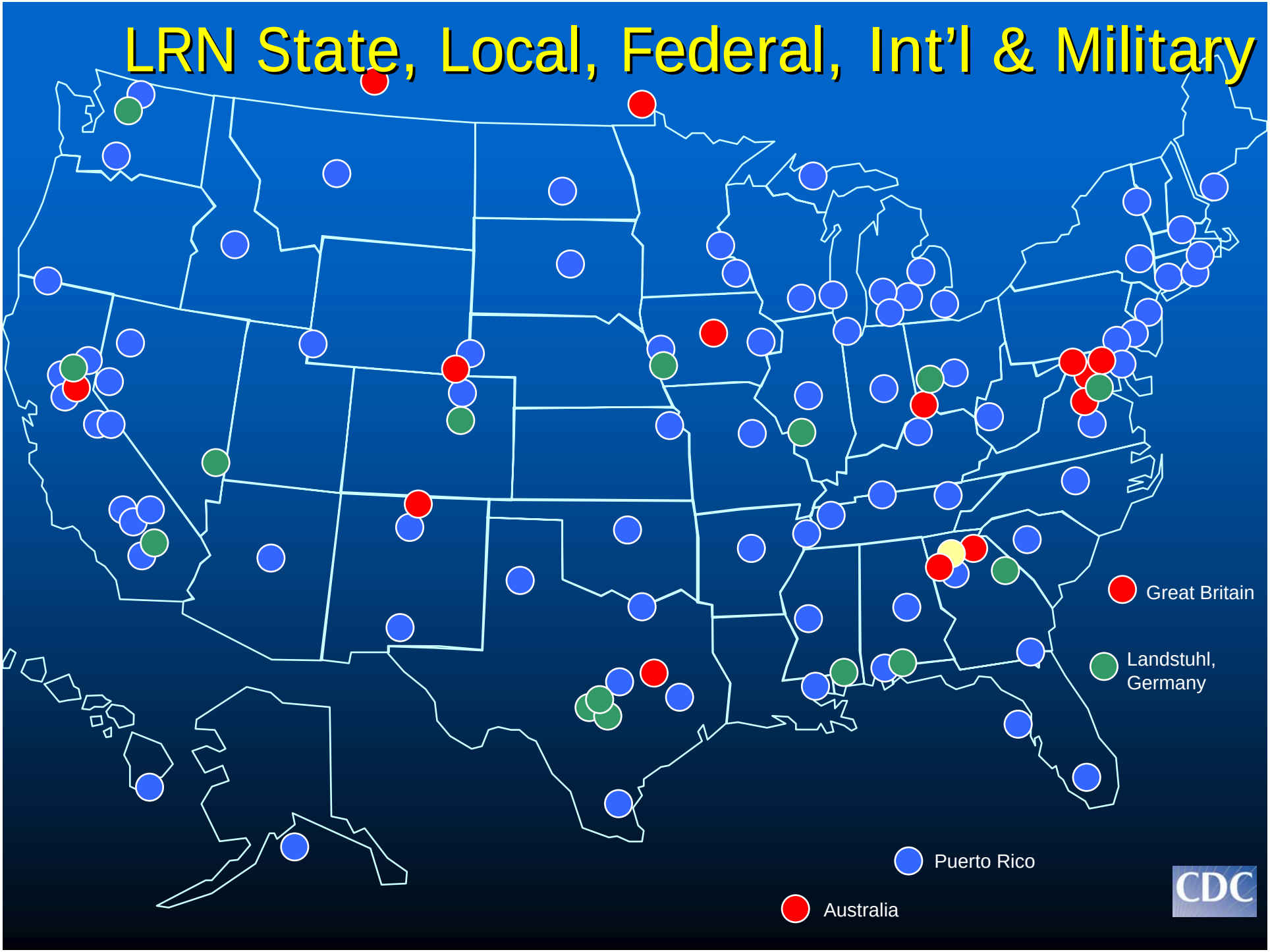
LRN State & Local Public Health Labs

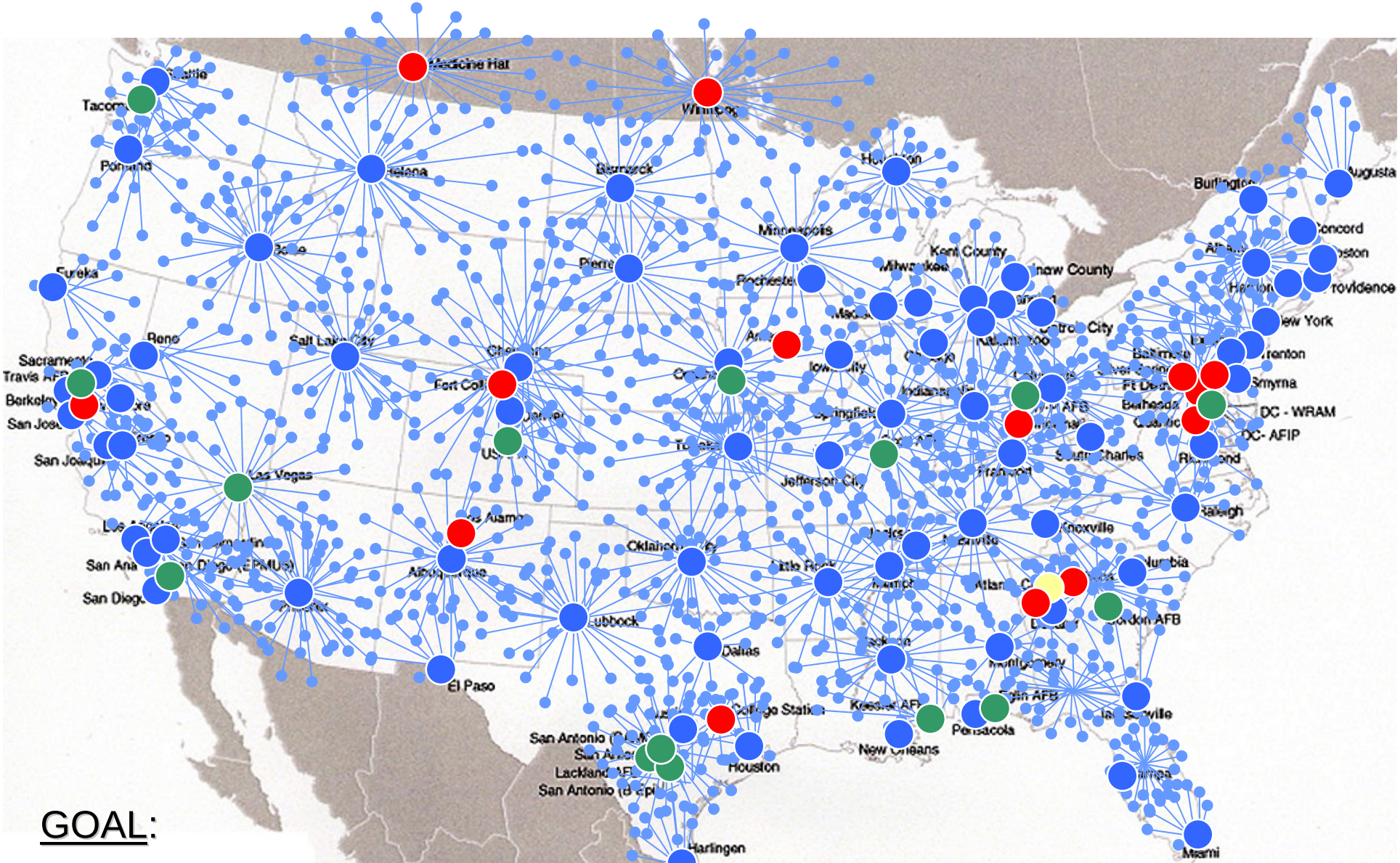


LRN State, Local, Federal & International



LRN State, Local, Federal, Int'l & Military





GOAL:

Integrated National Laboratory Response Network

LRN
Laboratory Response Network for Bioterrorism

LRN Formula

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

Do you have any questions?

CDC