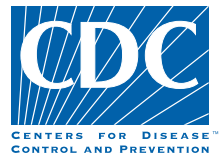


Laboratory Response Network



PREPARE | DETECT | RESPOND



The Laboratory Response Network

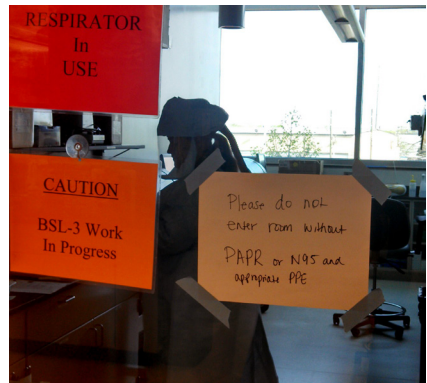
PREPARE | DETECT | RESPOND

The Laboratory Response Network (LRN), established in 1999 through a collaborative effort involving the Centers for Disease Control and Prevention (CDC), Federal Bureau of Investigation (FBI), the Department of Defense (DoD) and the Association of Public Health Laboratories (APHL), is an integrated network of state and local public health, federal, military and international laboratories that can respond to biological, chemical and other public health threats.

By linking state and local public health laboratories and clinical laboratories to other key LRN stakeholders, including first responders, clinical laboratories and international partners, the LRN provides an expert and efficient response to a variety of public health threats.



A laboratorian tests a sample at the Minnesota Department of Health Public Health Laboratory, an LRN member laboratory

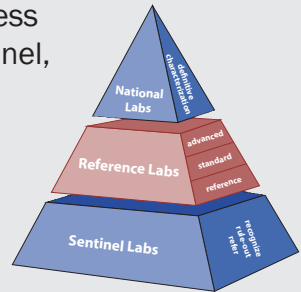


The Indiana State Department of Health Laboratory was one of the first LRN member laboratories to detect Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV) in the US during the 2014 outbreak.

The quick response and rapid testing, a cornerstone of the LRN, was critical to contain the outbreak.

LRN for Biological Threats Preparedness

The LRN for Biological Threats Preparedness (LRN-B) is composed of three levels: Sentinel, Reference and National Laboratories. Reference laboratories are further subdivided into Reference, Standard and Advanced. The following are the capabilities for each level:



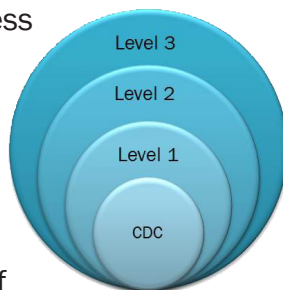
National Laboratories: there are three national laboratories (1) Centers for Disease Control and Prevention, (2) United States Army Medical Research Institute for Infectious Diseases and (3) the Naval Medical Research Center. These laboratories have specialized testing capabilities (e.g. Biosafety Level 4 facilities, strain characterization) and provide test development and agent specific subject matter expertise which can be leveraged when needed by the network.

Reference Laboratories: over 130 laboratories, categorized as Reference, Standard and Advanced, provide testing for high priority threat agents in a variety of matrices. In addition to their testing function, these laboratories also conduct outreach to sentinel clinical laboratories, first responders and other partners.

Sentinel Laboratories: thousands of laboratories, notably hospital based, work closely with local and state public health and federal laboratories to recognize and rule-out potential biological threat agents and other emerging threats to public health. Sentinel laboratories are an integral part of the LRN with the system relying heavily on their ability to recognize, rule-out and/or refer potential threats.

LRN for Chemical Threats Preparedness

The LRN for Chemical Threats Preparedness (LRN-C) is composed of 53 laboratories and is categorized into three distinct levels: one, two and three. Starting with level three and building upward, each designation carries additional safety requirements and testing capabilities, in addition to the duties and requirements of the preceding level. The following are minimum capabilities required at each level:



CDC Laboratories provide a high level of analysis, including a rapid toxicology screen to detect exposure to chemical threats. Further, they maintain a quality system within the LRN-C by developing methods and providing proficiency testing and exercises.

Level 1 Laboratories provide surge capacity for CDC and can detect exposure to an expanded number of chemicals, including mustard agents, nerve agents and toxic industrial chemicals.

Level 2 Laboratories are trained to detect exposure to a number of chemical threat agents, including cyanide, nerve agents and toxic metals.

Level 3 Laboratories work with hospitals and first responders to maintain competency in clinical specimen collection, packaging and shipment.

The LRN in Action

Support for Public Health: Ebola Response

In 2014, the LRN-B responded to the West Africa Ebola outbreak by deploying the US Department of Defense developed assay for Ebola virus (Zaire ebolavirus) to selected state and local public health LRN Reference Laboratories. APHL

supported this preparation and provided a risk assessment template to the selected laboratories. These efforts paid off in September 2014, when the Texas Department of State Health Services, Laboratory Services Section, a member of the LRN, diagnosed the first case of Ebola in the US in Texas. CDC confirmed results the same day. A similar laboratory response followed in the two subsequent cases in healthcare workers who treated the index patient.



Laboratorians at the Texas Department of State Health Services, Laboratory Services Section, an LRN member laboratory, testing a clinical sample for *Ebolavirus*

Success Through Partnerships

A Utah woman attempted suicide by cooking castor beans and consuming ricin, a highly toxic substance produced from the seeds of the castor oil plant. The Utah Public Health Laboratory (PHL)

received environmental and patient clinical specimens for testing. However, the LRN-C component had not yet completed their proficiency for ricinine, a detection indicator for exposure to ricin. The Utah PHL engaged the New Mexico Department of Health, Scientific Laboratory Division, who performed testing and obtained the same result as the Utah LRN-C, confirming the patient's exposure to ricinine and illustrating the importance of partnerships across the LRN.



Castor beans, used to make ricin

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