APHL 2012

PUBLIC HEALTH LABORATORY RESPONSE

UNMET NEEDS

- Increase CDC Public Health Emergency Preparedness (PHEP) funding for public health laboratories to prepare for and respond to all threats.
- Increase funding to CDC to expand public health laboratory outreach, training and coordination with sentinel clinical, including hospital, veterinary, food and environmental laboratories where threat agents may first be detected.
- Maintain current funding at CDC for laboratory response to incidents involving chemical threats.
- Provide funding to CDC to improve states' ability to detect radiological exposure in humans.

BACKGROUND

Congress authorized funding for the Public Health Emergency Preparedness (PHEP) cooperative agreement to support preparedness nationwide in state, local, tribal, and territorial public health departments in 2002, shortly after the events of September 11, 2001, and subsequent anthrax attacks. The PHEP cooperative agreement enables public health departments to have the capacity and capability to effectively respond to public health threats, including infectious disease outbreaks; natural disasters; and biological, chemical, nuclear, and radiological emergencies.

STATE AND LOCAL PUBLIC HEALTH LABORATORIES COMPRISE APPROXIMATELY 70% OF THE 160 LRN BIOLOGICAL REFERENCE LABORATORIES AND ALMOST 100% OF THE LRN CHEMICAL LABORATORIES.

CDC FUNDING
Preparedness
(Dollars in millions)

FY 2012 $657 (Enacted)
FY 2013 $715 (APHL Required Amount)

A critical component supported by the PHEP cooperative agreement is the Laboratory Response Network (LRN). Formed in 1999 by the CDC, FBI and APHL, the LRN is our nation's premier system for identifying, testing and characterizing potential agents of biological, chemical and radiological terrorism, emerging infectious diseases and other public health emergencies. State and local public health laboratories comprise approximately 70% of the 160 LRN biological reference laboratories and almost 100% of the LRN chemical laboratories. These laboratories produce high-confidence test results that form the basis for threat analysis and intervention by both public health and law enforcement authorities.

APHL
The Association of Public Health Laboratories
8515 Georgia Avenue Suite 700 Silver Spring, MD 20910 | Phone: 240.485.2745 | Fax: 240.485.2700 | www.aphl.org

LRN FOR BIOLOGICAL TERRORISM PREPAREDNESS (LRN-B)

The LRN-B is a widely distributed, flexible network serving as a public health security asset with a proven record of rapid response to all-hazard threats. LRN-B laboratories are designated as either national, reference, or sentinel clinical. Designation depends on the types of tests a laboratory can perform and how it handles infectious agents to protect workers and the public. The unprecedented linkage of clinical laboratories (hospitals and commercial), reference laboratories (state and local public health, veterinary, military, food, environmental, federal and international) and federal laboratories (CDC and Department of Defense) assures a strong network capable of responding to public health threats.

Before the anthrax attacks of 2001, few states had high throughput molecular detection systems. Now they all do. What many people don't know is that the LRN laboratories are incredibly busy every day, everywhere. Some examples of notable successes where the LRN-B was utilized as a national asset include the following: Georgia G8 Summit, Republican and Democratic National Conventions, Superbowls, anthrax mailings to Governors, Congress, and US Embassies. The 'dual-use' public health emergency infrastructure built as a part of the LRN was integral to the 2009 H1N1 response by ensuring rapid and effective communication, molecular testing staff and ability, and proper biosafety controls. Nearly every LRN facility across the United States played some part in the H1N1 response or was prepared to become involved. For the H1N1 response, Congress quickly authorized additional funding via a new mechanism, the CDC Public Health Emergency Response Grant. These one-time investments, however, are not a viable approach for long-term public health preparedness and response. Without continued support, the LRN-B laboratories will lose their core capabilities to respond, and much of the public health infrastructure that has been developed with PHEP funding will also be lost.

THE TEN NATIONAL SURGE LABORATORIES HAVE PROVEN THROUGH PROFICIENCY TESTS, DRILLS AND EXERCISES THEY CAN TEST 5,000 HUMAN SPECIMENS TO DETECT EXPOSURE TO CHEMICAL THREAT AGENTS IN ONE WEEK OR LESS.

LRN FOR CHEMICAL THREAT PREPAREDNESS (LRN-C)

The Tokyo subway sarin gas attack demonstrated that laboratories need to be able to test for thousands of samples in a short amount of time. The chemical component of the LRN-C constantly prepares and tests their network to respond to such an event. The ten national surge laboratories have proven through proficiency tests, drills and exercises they can test 5,000 human specimens to detect exposure to chemical threat agents in one week or less. These laboratories along with the other 37 laboratories in the LRN-C can respond to local events in a quick and efficient manor to calm public fears or drive treatment regimens. Massachusetts recently used this capability during a chemical exposure event that led to the destruction of over 13,000 bushels of clams.

In early June 2010, fishermen in Massachusetts pulled something unusual out of the water: a cylinder. Soon after, two patients went to the hospital with blisters or chest pain and tingling; symptoms consistent with chemical weapon exposure. Due to LRN-C funding, the state public health laboratory was able to test the fishermen for chemical weapon exposure, including mustard gas and lewisite. Within 12 hours the first patient tested positive for lewisite, while the second patient was negative. Without continued support, the LRN-C laboratories will lose their capabilities and rapid response will be history.

RADIOLOGICAL DETECTION

There is limited laboratory capability in the US to measure people for radiological exposure. Only 15 public health laboratories can measure radiation in human samples, and most of these labs can only measure one radioactive element, Uranium.

In the weeks following the March 2011 earthquake, tsunami and Fukushima Power Plant explosions in Japan, the US activated emergency response mechanisms not only to support efforts in Japan but also to focus on preventing potentially harmful effects of fallout in the US. Several federal and public health laboratories tested air, precipitation and milk for Iodine-131 and found elevated levels following the Fukushima incident. Members of the public clambered for Iodine pills, despite being warned of their inefficacy for this situation. Had this event happened closer to home, laboratory capacity would have been overwhelmed almost immediately and panic would have spread quickly.

Radioactive materials can be easily acquired, and only a small amount can cause mass panic.

- In Monroe, NJ, a woman used radioactive Thallium-201 to murder her estranged husband. She worked as a chemist at a major biopharmaceutical company that uses Thallium-201 for medical imaging agents. Even with current safeguards in place to protect medical-grade radioactive materials, it is too easy to steal these materials.
- In the event of a more widespread radiation event, such as a dirty bomb, hundreds of thousands of people will panic. Only a few hundred or thousand may actually be exposed and in need of treatment. However, radiation poisoning symptoms can be vague and show up in the “worried well.” Medical countermeasures to treat victims of radiation sickness are in limited supply and expensive to make. The treatment window is less than two weeks long, and the truly exposed will need treatment quickly. Rapid screening capabilities are needed in the laboratories in order to respond to such an event.

CDC is working to develop rapid screening methods for radioactive elements. With funding support, laboratories can purchase needed equipment and receive training and methods from CDC to develop this needed capability.

ONLY 15 PUBLIC HEALTH LABORATORIES CAN MEASURE RADIATION IN HUMAN SAMPLES AND MOST OF THESE LABS CAN ONLY MEASURE ONE RADIOACTIVE ELEMENT, URANIUM.

APHL
2012

TRAINING

One of the continued successes of the LRN is the ability to perform training and outreach with the sentinel clinical laboratory community (e.g., hospitals and commercial laboratories). These laboratories are likely the first to encounter patient samples. In 2011, these sentinel clinical laboratories sent 1,800 potential threat samples to state and local public health LRN reference laboratories for confirmatory testing. As such, it's important that the sentinel clinical laboratories are properly trained and capable of responding to the next emerging threat. In 2011, state and local public health laboratories that comprise the reference tier of the LRN-B offered 477 training courses that reached a total of 8,360 laboratorians. Years of outreach and partnership have created a warm base of knowledge that makes up the basis of national preparedness efforts. These essential outreach and training services are in jeopardy; without sustained and increased funding, they are at risk for extinction.

FIELD DEVICES

The Department of Homeland Security (DHS) provides funding to first responders for purchase of biological and chemical detection kits and devices to provide fast identification of threat agents. Unfortunately, many of the vendor's claims are untested—and often, the results are neither accurate nor valid. Even more troubling, first responders are typically unaware that the kits and devices have limitations. No federal agency has acknowledged responsibility to standardize these assays, validate that they perform, or provide ongoing training to the workers using them. Meanwhile, the lives of the first responders and the public remain at risk. To protect the public, first responders and laboratorians, it is important to provide funding and designate a lead federal agency to coordinate the development of a comprehensive evaluation process and operational guidance for field assays, kits and devices. ■

CONTACT

For more information, contact Peter Kyriacopoulos, senior director of public policy, 240.485.2766, peter.kyriacopoulos@aphl.org.