

# PUBLIC HEALTH LABORATORY RESPONSE

## UNMET NEEDS

- Increase CDC Public Health Emergency Preparedness funding for public health laboratories to prepare for and respond to all threats.
- Provide resources to build and maintain a competent public health laboratory workforce, ensuring outreach, training and coordination with sentinel clinical and other laboratories.
- Increase funding at CDC to support the nation's Laboratory Response Network, which ensures a robust system for the detection of biological, chemical and emerging threats such as Ebola, Zika and the opioid crisis.
- Provide funding to CDC to improve States' ability to detect radiological exposure in humans.

## BACKGROUND

In accordance with Presidential Decision Directive 39, the US Centers for Disease Control and Prevention (CDC), the US Federal Bureau of Investigation and APHL formed the Laboratory Response Network (LRN) in 1999. This network is the nation's premier system for identifying, testing and characterizing potential biological and chemical terrorism agents as well as emerging threats. The LRN's integrated system of state and local public health, federal, military and international labs enables it to respond quickly to all threats. State and local public health laboratories comprise approximately 70% of the 134 reference-level LRN for Biological Threats Preparedness (LRN-B) labs and almost 100% of the LRN for Chemical Threats Preparedness (LRN-C) labs. These laboratories produce high-confidence test results that are the basis for threat analysis and intervention by both public health and law enforcement authorities.

The Public Health Emergency Preparedness (PHEP) cooperative agreement has supported preparedness and response efforts in state, local, tribal and territorial public



health departments since 2002. This funding ensures that public health departments, including laboratories within the LRN, have the capacity and capability to effectively respond to all-hazard threats, such as infectious disease, natural disasters, and biological, chemical, nuclear and radiological emergencies.

## LRN FOR BIOLOGICAL THREATS PREPAREDNESS

A primary concern of the global public health community is emerging infectious diseases such as Zika, Ebola, Middle East Respiratory Syndrome (MERS) and novel influenza viruses. In 2015, Zika virus, which causes infant microcephaly and a rare immune disorder called Guillain-Barré syndrome, emerged in the Americas where the outbreak reached pandemic levels. As of January 2018 in the US alone, there were 37,165 locally-acquired cases in US territories and 281 in US states, with an additional 5,372 travel-associated cases of Zika virus—statistics that have kept the World Health Organization and CDC vigilant. The CDC leveraged the LRN-B to rapidly implement testing capabilities in public health laboratories across the country.

Response to Zika has not been the first time the LRN-B has been called into action; in 2014, the network was leveraged to respond to one of the largest Ebola outbreaks in history. The LRN-B has also responded to other public

health threats such as anthrax, West Nile virus, H1N1, SARS and MERS. The distributed model of the LRN-B ensures nationwide capacity to rapidly respond and implement testing capabilities for threats.

The ability of our nation to prepare for and respond to global threats is made possible due to CDC PHEP funding, which supports over 800 laboratory scientists in the 50 state, District of Columbia and Puerto Rico public health laboratories. In 2017, this funding allowed these laboratories to test thousands of samples for various threat agents. The ability to rule-out threats is equally important for global health security, as demonstrated in the ongoing response to Zika. However, as PHEP funding declines, there is an erosion of the skilled laboratory workforce which is difficult to rebuild while constantly responding to threats.

### LRN FOR CHEMICAL THREATS PREPAREDNESS

54 local and state public health labs comprise the LRN-C, which maintains laboratory response capabilities to respond to local chemical emergencies. The LRN-C utilizes highly specialized, sophisticated equipment to determine exposures to chemical threat agents in order to calm public fears or drive treatment regimens. The ten Level 1 labs have advanced capabilities, and through dedicated PHEP funding, provide CDC surge testing capacity nationally. This critical infrastructure is routinely leveraged to address local issues, such as the opioid crisis many jurisdictions are now facing. For instance, in 2016, LRN-C on-call chemists in one state identified an unknown white powder as the opioid furanyl fentanyl after a police detective was exposed while performing a drug field test and experienced a rapid onset of symptoms. This rapid response testing capacity provides vital public health information to assist with managing suspected exposures.

In 2018, a chemical poisoning caused hundreds of cases in at least ten states, resulting in at least five fatalities. It began with a cluster of Illinois residents with severe bleeding who reported using synthetic cannabinoid products. The long-acting anticoagulant brodifacoum, previously sold in mouse and rat baits, was found in patients' blood. The Indiana State Department of Health alerted their residents of the issue, and after two similar cases, developed a food sample method, then collected and tested samples of synthetic cannabinoids for brodifacoum. Meanwhile, Wisconsin also had cases related



to this outbreak so the Wisconsin State Laboratory of Hygiene worked with CDC to quickly develop a quantitative patient test. As a member of the regional Midwest Network, Wisconsin State Laboratory of Hygiene offered to test patients in states that didn't have the testing capability. As a result, Wisconsin State Laboratory of Hygiene confirmed suspected cases from many states. Patients will be tracked over time to provide important information on the future elimination of brodifacoum in humans.

Currently, there is no dedicated funding for radiological threats preparedness in public health laboratories. The ability to detect radiological exposure in humans lies solely at CDC and the US Department of Energy, presenting a huge hurdle in terms of testing capacity (and shipping) during an incident. Funding is needed to allow CDC to expand testing abilities to the highest number of radiological threat agents (\$5M) and to support the states' ability to detect radiological exposure in humans (\$12M), essentially standing up an LRN-R.

### RESPONDING TO NATURAL DISASTERS

Public health laboratories respond to various threats, including natural disasters. Recent hurricane seasons have tested systems in Florida, Texas, Puerto Rico and the US Virgin Islands (USVI) with Puerto Rico and USVI still in the recovery phase. Labs in Texas experienced an increase in testing of water samples, while Puerto Rico encountered an overall increased demand for services, including milk and drinking water testing. The LRN leveraged support from other member laboratories to assist with surge testing, enabling only minor interruptions in services. This support would not be possible without CDC PHEP funding. ■

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