Laboratory Response Network for CHEMICAL THREATS

20 years of Preparedness

In 2019 CDC celebrates its 20-year partnership with local and state public health laboratories participating in the Laboratory Response Network for Chemical Threats (LRN-C). The LRN-C was created to strengthen CDC's testing capacity for responding to a large-scale emergency involving chemical warfare agents. Over the years, the LRN-C expanded its mission and provides critical local and state infrastructure for a wide range of chemical threats affecting U.S. communities.

National Asset

In 1995, terrorists released the chemical warfare agent sarin on a Tokyo subway, impacting nearly 5,000 commuters. The event highlighted the need for national laboratory capacity to rapidly test thousands of exposed people to inform medical treatment during a large-scale emergency. In the years following, CDC developed many laboratory test methods for identifying exposures to chemical threat agents listed in the Chemical Weapons Convention. Yet, CDC's testing capacity remained limited. The LRN-C was established to expand CDC's laboratory preparedness in the event of a large-scale chemical emergency.

Local Asset

In 2002 at the Association of Public Health Laboratories' "Ready or Not" conference, public health laboratory representatives and preparedness experts from across the U.S. recognized the need for local laboratory response to chemical terrorism. They recommended the current framework of the LRN-C, and in 2003, with the support of CDC's Public Health Emergency Preparedness funding, city and state public health laboratories volunteered to participate. The LRN-C network model of today not only ensures national laboratory preparedness; it also provides readiness and expertise for local public health programs.

CDC Support for the LRN-C

CDC's LRN-C Technical Program provides substantial support to local and state public health laboratory members of the LRN-C. These services include chemical threat response materials, proficiency testing, lab referral capabilities, secured data messaging, response readiness drills, hands-on training, and laboratory technical assistance. In return, LRN-C member laboratories provide CDC with expanded national testing capacity for identifying chemical threat exposures. In addition to chemical testing capabilities, laboratories provide coordination with local hospitals and first responders as well as support to local laboratories with sample packaging and shipping.

By the **Numbers**

54
LRN-C member laboratories located in the U.S., including one U.S. territory

8,500
clinical samples can be processed, tested and reported to CDC within a 24 hour period

44
laboratories can identify exposures to toxic chemical agents such as cyanide, nerve agents, and toxic metals

10
laboratories with high threat testing capabilities for mustard agents, nerve agents, and toxic industrial chemical exposures

84%
of Americans live within 100 miles of an LRN-C laboratory

Ready to Respond

The LRN-C's laboratory capacity to respond to national, large-scale exposures to chemical terrorism agents is readily available for immediate and local needs.

Sulfur Mustard in Massachusetts

In 2010, a fisherman was hospitalized after an accidental exposure to buried World War I munitions off the coast of New Bedford, MA. The Massachusetts LRN-C Level 1 laboratory detected exposures to high threat chemical agents. The patient tested positive for exposures to Lewisite and sulfur mustard, which are both known blister agents, allowing for rapid treatment and prevention of further exposures.

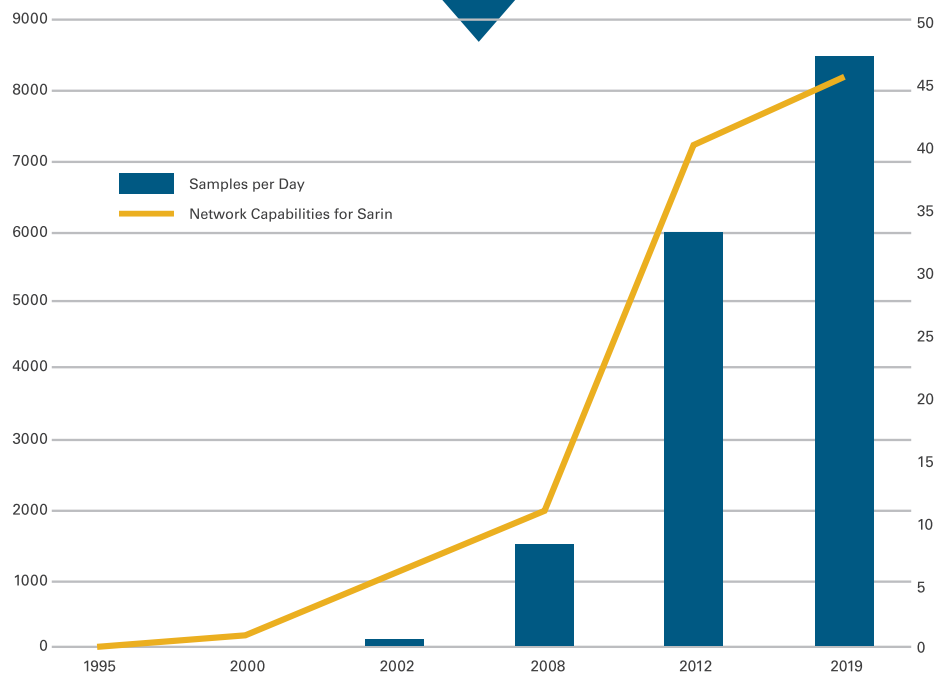
Fungicide in Minnesota

In 2016, during the renovation of a historic courthouse in Minnesota, nine construction workers exhibited symptoms consistent with exposure to tear gas. The Minnesota LRN-C Level 1 laboratory was able to leverage its chemical threat testing capacity to identify chloropicrin as the causative agent. Chloropicrin is a known fungicide and chemical warfare agent that was commonly used in the 1920s as a part of theft deterrent devices in bank vaults.

Rodenticide in Synthetic Marijuana

In 2018, following six suspected cases of synthetic marijuana poisonings, the Wisconsin LRN-C Level 1 laboratory rapidly developed a test method to detect the anticoagulant brodifacoum. Brodifacoum is described as a "super-warfarin" originally designed to be used as rodent poison. The anticoagulant was presumed to be used in the synthetic marijuana to enhance euphoric effects. The outbreak consisted of more than 200 reported hospital cases in over 10 states nationwide.

20 Years of Increased National Testing Capacity



CDC developed tests for exposures to various chemical warfare agents in the late 1990s, yet sample capacity was still quite low. Strategic partnerships with local and state public health laboratories allow testing of the expected high number of patient tests needed during a large-scale emergency.

LRN-C: TIMELINE

1999
CDC funds five public health laboratories to serve as expanded laboratory capacity

2002
APHL "Ready or Not" Meeting convenes to discuss the need for local chemical threat laboratory capacity

2003
CDC funding is available to build chemical threat preparedness capacity in all 50 states

2004
LRN-C laboratories are designated as Level 1, Level 2 or Level 3 based on laboratory testing capacity

2014
LRN-C Level 2 laboratory response to a chemical spill in Elk River, West Virginia affecting nearly 300,000 residents

LRN-C Level 1 laboratory response to concerns of per-and polyfuoroalkyl substances (PFAS) in drinking water of over 3,000 residents in upstate New York

2015
LRN-C Level 2 laboratory response to toxic wastewater in Colorado's Animas River affecting more than 17,000 residents

2016
Michigan LRN-C Level 1 lab begins supporting the ongoing public health crisis in Flint, MI

LRN-C Level 2 lab in Alaska supports concerns of high levels of arsenic in private wells in an area affecting 100,000 residents

2019
54 chemical threat preparedness programs located in all 50 states, three cities, and one U.S. territory