About Public Health Laboratories

US public health laboratories monitor and detect diseases and other health threats to protect the health of Americans.

Ask an American to define the term “public health laboratory,” and you are likely to get a puzzled look. Yet these highly specialized governmental health laboratories protect our lives daily.

Working at the federal, state and local level, public health laboratories monitor and detect health threats ranging from rabies and dengue fever to radiological contaminants, genetic disorders in newborns and terrorist agents. Equipped with sophisticated instrumentation and staffed by highly trained scientists, these unique institutions deliver services that may be unavailable or cost-prohibitive elsewhere.

Public health laboratories form the backbone of a national laboratory network on alert 24/7 to respond to novel strains of disease, natural disasters, chemical spills, foodborne outbreaks and other health emergencies. They collaborate closely in these efforts with the Centers for Disease Control and Prevention and other federal agencies including the Environmental Protection Agency, the Food and Drug Administration, the Federal Bureau of Investigation and the Department of Homeland Security.

Public health laboratories also partner with the World Health Organization and other international health entities to prevent and control health threats. For example, state public health laboratories participate in the WHO Global Influenza Surveillance Network which monitors circulating strains of influenza to inform selection of those to be included in the annual flu vaccine.

Inside a Public Health Laboratory

The scope and value of public health laboratories’ work will be clearer if we take a short detour to a state public health laboratory.

In a single morning at a hypothetical state public health laboratory, bats, beach water, various human specimens and an unidentified white powder arrive for analysis. Testing must be completed promptly because test results will assist health officials and health care providers to make life-saving decisions. Will the four-year-old girl who picked up a bat require a rabies vaccination? Is it safe to swim at the local beach? Did the critically ill hospital patient contract a new and deadly virus? Does the white powder at the bank offices represent a terrorist threat or an accidental spill of an innocuous substance? The public health laboratory will deliver the answers.

And when the state is hit by a hurricane, flood or disease outbreak, this same laboratory will shift into emergency response mode, working long hours, often under difficult conditions, to handle a
surge in testing while also maintaining regular laboratory services. Newborns won’t wait to be born even during a hurricane.

**Strategically Located and Diverse**

Public health laboratories are strategically located across the United States. Every state and territory and the District of Columbia has a central public health laboratory that performs laboratory services for the jurisdiction. Many states also have local public health laboratories, ranging in size from large metropolitan laboratories to smaller facilities that serve a region or community.

Some governmental health laboratories specialize in a single area of laboratory practice such as environmental health, food safety or agriculture. They are likewise public health laboratories.

**A Culture of Quality**

Public health laboratories ascribe to a culture of quality. They continually strive to improve operations at their facilities and at clinical laboratories within their jurisdiction. They sponsor specialized training, send updates concerning health threats and share information on best practices. In many states, public health laboratories regulate private clinical and environmental laboratories. State public health laboratories also conduct applied research, for example, to develop enhanced testing methods.

**Public Health Laboratories in Action**

Read the following posts from the APHL blog to learn more about the contributions of public health laboratories.

**Newborn Screening**

Public health laboratories screen in 97% of the four million babies born the US annually for genetic and metabolic disorders that must be treated soon after birth to prevent lifelong disability or death. Each year, public health laboratories and their partners in the newborn screening system save or improve the lives of 12,000 children.

Meet some of the children and families whose lives have been touched by newborn screening:


**Food Safety**
Public health laboratories constantly monitor for outbreaks of foodborne diseases through a national network called **PulseNet**. By comparing the molecular fingerprints of foodborne pathogens, they can connect the dots between cases to halt outbreaks quickly before more people become sick. Many labs also test milk and animal livestock feed to safeguard the quality of products that directly or indirectly affect humans.


**Emergency Response**

Public health laboratories remain poised to respond to intentional attacks, natural disasters, disease outbreaks and accidents involving hazardous substances. They form the backbone of the US laboratory network for emergency response, the **Laboratory Response Network**.


**Environmental Health**

Public health laboratories assure the safety of water, soil and air through testing for chemical, biological or radiological agents and other contaminants. They also measure levels of chemicals in human tissues and fluids to assess potential environmental exposure.