

CDC LABORATORIES – A KEY LINE OF DEFENSE

How CDC labs keep you safe

CDC ensures America's health security with more than 150 state-of-the-art laboratories that are a key line of defense against emerging health threats. CDC scientists and other staff use the latest technology to detect infectious organisms, food-borne outbreaks, and biosecurity threats; protect America's blood supply; screen for genetic and other health risk factors; monitor the health of communities; identify environmental hazards; and much more.



CDC labs save lives and protect people.

Setting the standard for laboratories everywhere

CDC laboratories serve as vital reference laboratories for the U.S. and the world, aiding in critical disease detection, investigation, and public health research. Key laboratory work includes:

- Early warning system for new germs such as MERS-coronavirus and chikungunya virus
- Monitoring changes in known germs that hurt people, including new drug-resistant strains like carbapenem-resistant Enterobacteriaceae (CRE) in hospital settings
- Disease tracking system for outbreaks such as Ebola and Enterovirus EV-D68
- Analyzing environmental health threats such as lead exposure in children and chemical spills
- State-of-the-art diagnostic tests and tools, such as Advanced Molecular Detection technology that helps scientists detect health threats quicker
- Reference materials (strains, cultures, and blood samples) that help confirm germs, evaluate new diagnostic tests, and provide quality assurance for other laboratories

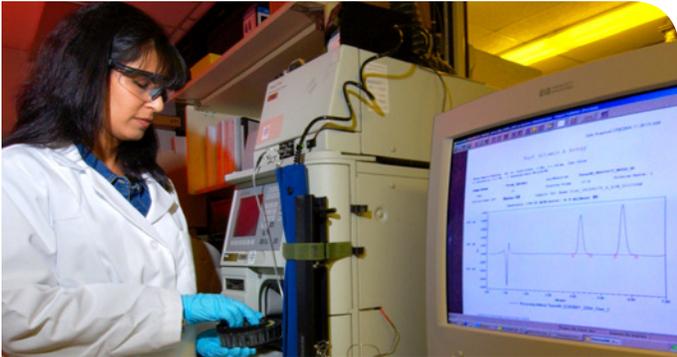
Biosafety levels in CDC laboratories

CDC has the expertise to operate laboratories at all levels of biosafety. All laboratories require special training and equipment, whether lab staff are working with relatively safe materials or the deadliest germs on earth. The four biosafety levels (BSL) are:

- BSL1 – these labs handle agents that pose minimal risks and are not known to consistently cause disease in healthy adults
- BSL2 – these labs handle agents that pose only moderate risks to lab staff or the environment
- BSL3 – these labs handle agents that can cause serious or fatal disease
- BSL4 – the highest level of lab safety in the world, these labs handle the deadliest germs for which there is no known cure or treatment

How CDC makes laboratories better

CDC does more than operate laboratories – we help strengthen laboratory science and laboratory networks around the U.S. and globally. Strong laboratory networks that use the latest best practices and technology are crucial in stopping fast-moving disease outbreaks in the 21st century.



CDC operates labs and helps strengthen laboratory systems worldwide.



Safety is the highest priority in CDC labs.

Using the latest technology >

In a world where outbreaks can travel as quickly as a passenger jet, faster technologies are needed to rapidly identify emerging health threats and understand how they spread. CDC's Advanced Molecular Detection and Response to Infectious Disease Outbreaks (AMD) Initiative combines proven disease investigation methods with advanced molecular methods and computing technologies to help laboratories make significant leaps toward protecting against outbreaks of infectious disease. In 2014, CDC used the AMD method "next generation" sequencing to produce the first genomic sequence of the deadly Ebola strain in Liberia less than 72 hours after receiving patient samples.

- AMD can provide more precise and timely approaches to:
 - » Diagnosing known and emerging infections
 - » Detecting and responding to outbreaks
 - » Understanding, characterizing, and controlling antibiotic resistance
 - » Developing and targeting prevention measures, including vaccines
- What AMD accomplished in 2014:
 - » Doubled the number of labs at CDC with "next generation" gene sequencing
 - » 500% increase in scientific computing usage at CDC
 - » AMD methods allowed CDC and partners to detect at least 5 more clusters of Listeria illness than traditional methods
 - » CDC used AMD methods on 20 outbreaks of tuberculosis, providing key information that allowed state and local health departments to focus intervention resources

Improving laboratory safety >

CDC laboratories routinely work with some of the deadliest germs known to science. This work involves some amount of risk, and human error can never be completely eliminated, but CDC continues to improve standards for laboratory safety.

After a series of laboratory incidents that posed no risk to the public and only potential risk to lab workers, CDC started a comprehensive examination of its laboratory practices. Internal and external laboratory safety workgroups developed key findings and recommendations that are improving laboratory training, guidelines, and safety monitoring for some of CDC's highest biosafety level labs.

The latest science, improved safety processes, and monitoring will help CDC continue to lead the way for laboratories all over the U.S. and the world.

To learn more about CDC's 24/7 role in saving lives and protecting people, visit About Us:
<http://www.cdc.gov/about/24-7/>

To view this fact sheet on the web, visit:
<http://www.cdc.gov/about/lab-safety/cdc-labs-keep-you-safe.html>