

DIVISION OF HIGH CONSEQUENCE PATHOGENS AND PATHOLOGY



The Division of High Consequence Pathogens and Pathology (DHCPP) responds to the world's deadliest diseases, like Ebola, rabies, and anthrax. DHCPP scientists work every day to protect people's health, stop outbreaks, and save lives by preventing and controlling illness caused by bacteria, viruses, and prions. They investigate unexplained illnesses and study the long-term effects of infectious disease. They create cutting-edge diagnostic tests and perform life-saving research into vaccines and treatments. DHCPP experts run CDC's highest containment laboratories where they study potential bioterrorism agents—including smallpox—so they are ready to respond in the event of an attack.

How Does DHCPP Protect People?

Investigating Medical Mysteries

For decades, DHCPP scientists have received samples from around the world to help diagnose unexplained illnesses and identify new pathogens. For example, during the beginning of the 2015-2016 Zika outbreak, DHCPP pathologists discovered that Zika virus was found in the brain tissue of babies born with microcephaly. The finding showed the virus can pass from mother to fetus and reinforced the need to prevent Zika infections in pregnant women.

Evaluating New Vaccines

DHCPP scientists research lifesaving vaccines. Poxvirus experts from DHCPP are conducting a clinical trial using a novel FDA-approved vaccine for smallpox and monkeypox prevention. Working with the manufacturer and partners in the Democratic Republic of the Congo, researchers are enrolling and vaccinating health care workers who are at high risk of exposure to monkeypox to see how the vaccine performs.

Tracking Serious Illnesses

Understanding where pathogens exist can help prevent illness, death, and negative long-term health effects. After Hurricanes Irma and Maria hit Puerto Rico and the U.S. Virgin Islands in 2017, DHCPP helped respond to increased cases of leptospirosis, a disease people get from infected animals and contaminated water and mud. Experts from DHCPP are learning about leptospirosis and melioidosis in the territories through active hospital-based surveillance, animal surveillance, environmental testing, and laboratory and epidemiology trainings to build diagnostic and surveillance capacity. These activities will help determine if some people and areas are more at risk for the diseases and will help to develop ways to prevent and/or quickly identify potential infections in people.

DHCPP by the Numbers

- ▶ DHCPP monitors over 70 infectious diseases.
- ▶ DHCPP staff worked in over 20 countries in 2018 and 2019.
- ▶ DHCPP's Epidemic Intelligence Service Officers responded to 15 disease outbreaks in 2019 and 2020.





Stopping Disease Spillover from Animals to People

Many pathogens DHCPP studies start in animals and then spread to people—a process called spillover. To prevent these illnesses, scientists use a One Health approach to study, prevent, and control their spread.

- ▶ DHCPP field researchers studied Egyptian fruit bats in Python Cave, Uganda and found the bats served as natural reservoirs for Marburg virus, a relative of Ebola. Scientists are now tracking the bats to better predict areas where people are most at risk for Marburg infections.
- ▶ Division experts conduct national monitoring to identify prion diseases that infect people, like the human form of mad cow disease, and those that have the potential to impact people, such as chronic wasting disease (CWD). CWD is a fatal brain disease spreading among deer, elk and moose in 25 U.S. states. So far, no human cases have been reported, but because other prions cause disease in people, their monitoring systems are on the look-out.
- ▶ After a 2011 earthquake decimated Haiti's infectious disease control infrastructure, DHCPP's rabies program and partners re-built Haiti's dog vaccination program, community education, and rabies surveillance systems. Over the past 7 years, more than 1.5 million dogs have been vaccinated, human deaths have declined by 85%.

Responding to COVID-19

DHCPP scientists often respond in public health emergencies, including the COVID-19 pandemic. DHCPP experts' unique skills and expertise have proven critical in a number of activities. For example, DHCPP experts have used their knowledge of Kawasaki disease to help characterize and investigate multisystem inflammatory syndrome in children (MIS-C), a serious condition following COVID-19 infection. Division pathologists who are experienced in investigating deaths due to new or unusual pathogens have analyzed autopsy tissue to learn how COVID-19 affects sufferers. DHCPP scientists are applying their experience studying myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) to support CDC research on long-term effects of SARS-CoV-2 infection. Viral pathogen researchers who investigate the links between animal and human outbreaks helped track COVID-19 on mink farms and developed a test to detect prior infection in animals. By developing processes for rapid stand-up of certified COVID-19 testing, Division laboratory scientists expanded CDC lab capacity for COVID-19.

