

INFECTIOUS DISEASES PATHOLOGY BRANCH

Division of High Consequence Pathogens and Pathology

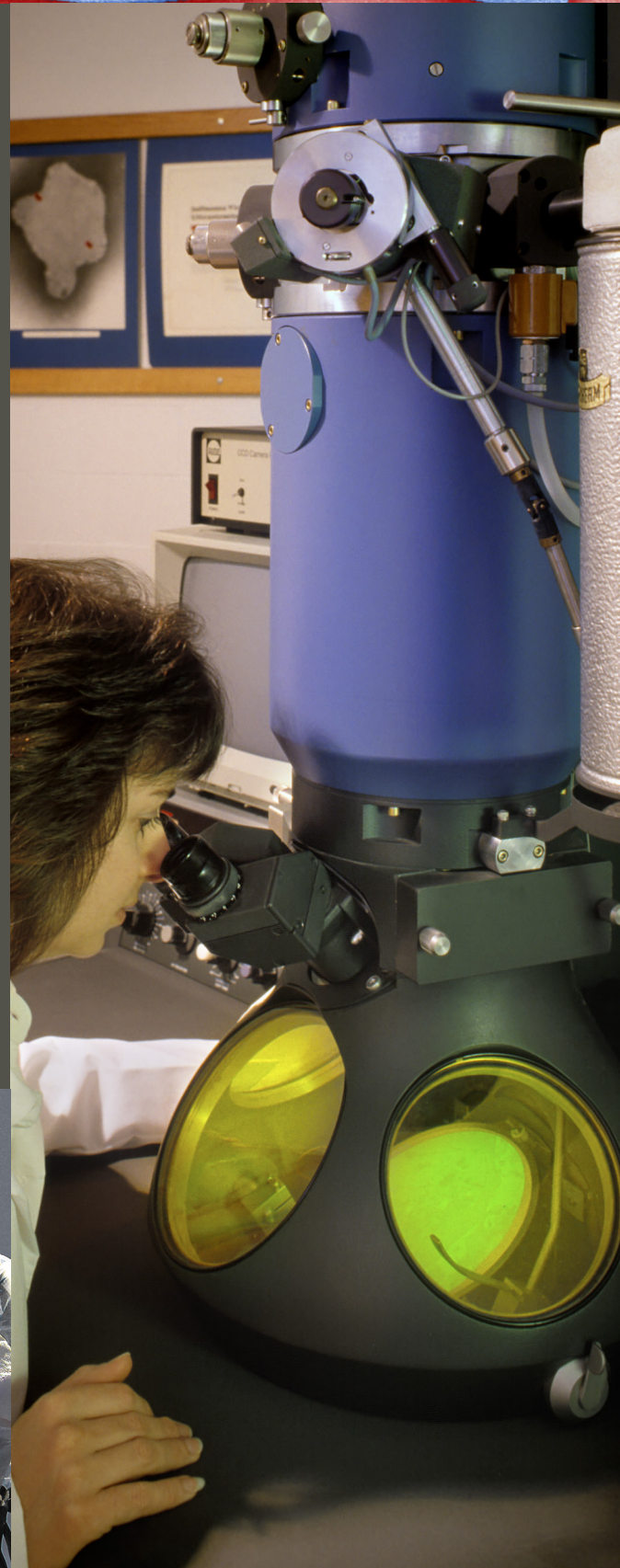


Investigating Infectious Diseases

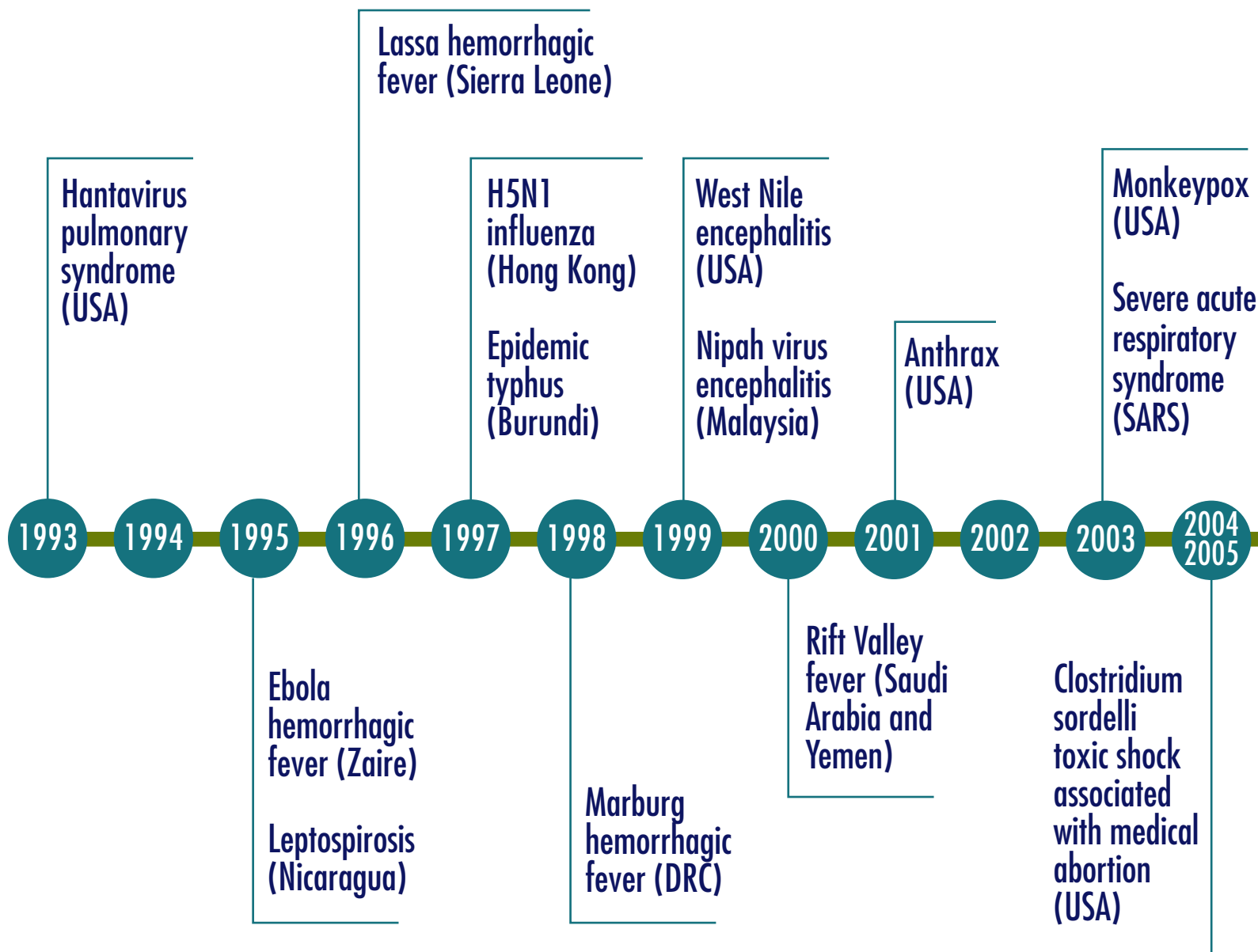
The Infectious Diseases Pathology Branch (IDPB) is a dedicated group of CDC disease detectives who bring together diagnostic pathology, epidemiology, and disease monitoring to help unravel some of the most difficult mysteries surrounding unexplained illness and death from suspected infections or other unknown causes.

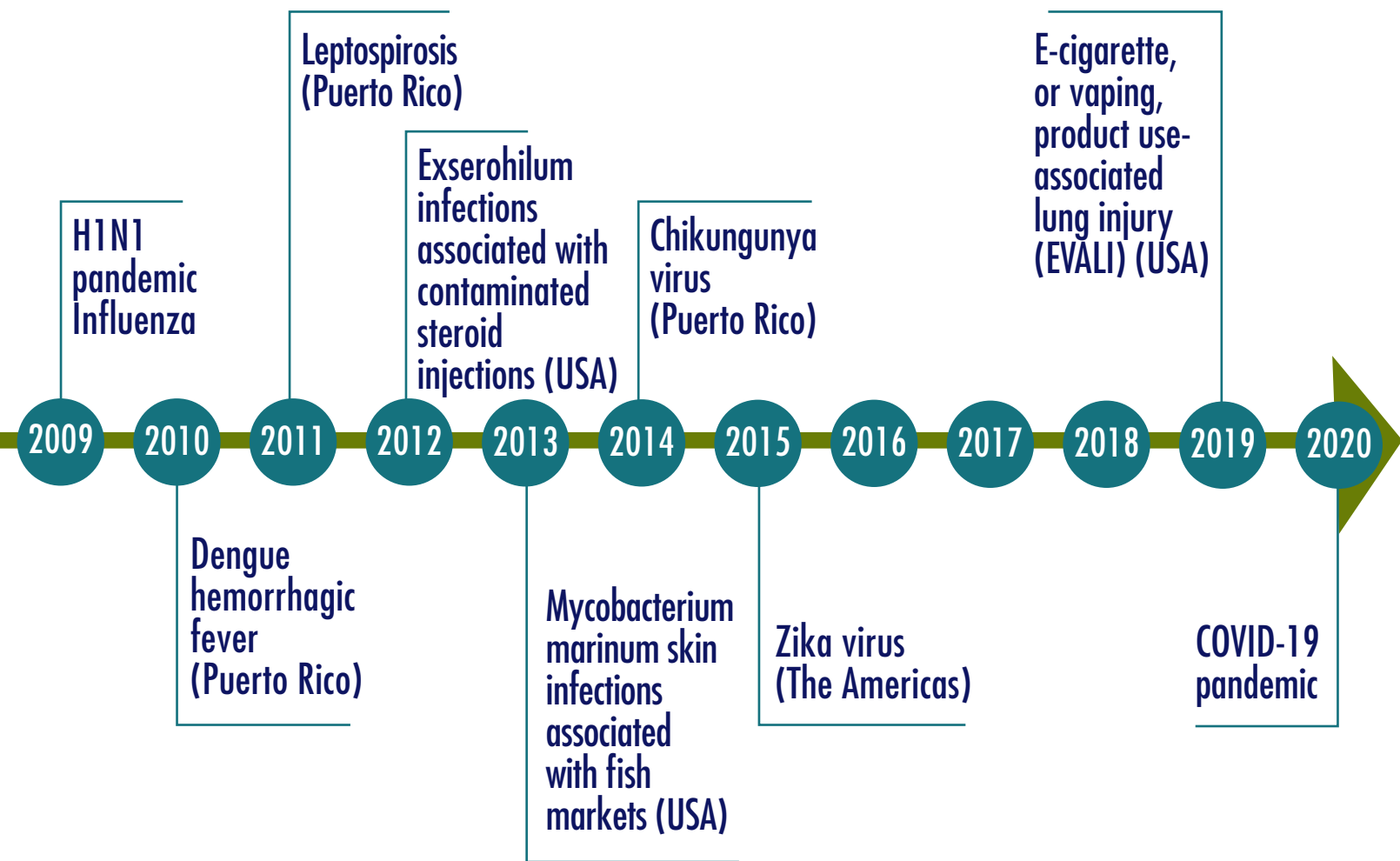
Using specialized tests and diagnostic techniques, they have identified and/or diagnosed many new and emerging diseases, such as hantavirus, Zika, West Nile, anthrax, pandemic flu, SARS, and COVID-19.

IDPB scientists expertly determine which germs are responsible for unexplained illnesses and deaths. They use advanced and classic diagnostic techniques to examine tissue samples to diagnosis rare and emerging diseases. They also look at which cells the germ affects to help understand how disease spreads within the body. Each year, they evaluate about 1,300 cases from all over the world and provide assistance and training to partners like state and local health departments, medical examiners and coroners, federal agencies, and other health organizations.



By the Year: Major Public Health Investigations





Uncovering Pathology of a Viral Pandemic

IDPB's experts are often called on when outbreaks occur, and many of our scientists have played an integral part in CDC's response to COVID-19. Since January 2020, they have tested tissue samples from hundreds of U.S. patients with suspected COVID-19. In a series of COVID-19 cases among older adults and people with underlying medical conditions, IDPB used cutting-edge diagnostic techniques to find that SARS-CoV-2, the virus that causes COVID-19, lodges itself deep inside lungs but also affects the upper airways. This information is vital to scientists' understanding of how COVID-19 develops once people are infected.

Using Advanced Molecular Methods to Identify and Type Germs

IDPB scientists develop and use cutting edge DNA sequencing-based tests and molecular technologies for rapid and cost-effective identification of a wide-array of germs in preserved tissues from patients with severe or fatal infections of unknown causes. This work enhances IDPB's diagnostic capacity and speeds up public health response by quickly identifying germs during outbreaks and complex case investigations. These tests particularly help in diagnosing and typing germs of public health importance, such as Mycobacterium tuberculosis complex, and in investigations of unexplained illness and deaths.

Helping to Understand to a Severe Lung Illness

From August 2019 through February 2020, CDC worked with the U.S. Food and Drug Administration and other partners to investigate a national outbreak of e-cigarette, or vaping, product use-associated lung injury (EVALI). More than 2,800 people from across the U.S. developed EVALI during this period, and 68 deaths were confirmed in 29 states and the District of Columbia. IDPB scientists joined the CDC response to EVALI to help understand this mysterious new illness and found that tissue samples from patients showed widespread damage to their lungs' air sacs (acute lung injury). Their analyses helped to characterize EVALI and show important differences between EVALI and more common respiratory illnesses like bronchopneumonia.

Using Telepathology to Consult on Disease-Causing Agents and Unexplained Deaths

IDPB uses telepathology to virtually consult on microscope images, train medical and veterinary residents and international pathologists, and communicate with medical professionals and public health partners around the globe. For example, IDPB pathology experts recognized free-living amoebae in images of brain sections from a young individual who developed rapidly progressing confusion and paralysis after recovering from a car accident. IDPB's use of telepathology continues to grow each year because it's easily accessible, convenient, fast, and cost-efficient for our submitters. Since 2015, IDPB has consulted on more than 230 microscope images through email.

Monitoring Diseases to Improve Children's Lives

Every year around the world, 6 million children from mainly developing countries die before their 5th birthday — often from preventable diseases, such as pneumonia and malaria. IDPB works with domestic and international partners in the Child Health and Mortality Prevention Surveillance Network (CHAMPS) to uncover the causes of high childhood mortality rates in Sub-Saharan Africa and South Asia. IDPB serves as the central pathology laboratory for CHAMPS, evaluating tissues samples using a variety of diagnostic tests. Since 2015, IDPB staff have evaluated more than 2,000 CHAMPS deaths from 7 countries. The ultimate goal of this program is to use cause-of-death data to inform policies to improve quality of life and reduce childhood deaths.

