

# National Center for Emerging and Zoonotic Infectious Diseases

Protecting Health at Home & Abroad



## NCEZID ROLE IN GLOBAL HEALTH

- ▶ Lead major outbreak responses, providing the technical expertise and workforce for outbreaks like Ebola and Zika
- ▶ Develop and deploy **innovative and cost-effective technologies** for global settings, leading to quicker diagnosis and earlier response
- ▶ Strengthen public health systems to prevent global spread of disease, including robust surveillance and epidemiology, and responsive and effective laboratories
- ▶ Reduce illness and death among U.S. travelers, expatriates and other globally mobile populations
- ▶ Support country efforts to build infection control capacity and improve antibiotic use



CDC's **National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)** protects people in the United States and around the globe from emerging (new) and zoonotic (spread between people and animals) infectious diseases. **NCEZID** scientists save lives and protect Americans by reducing the spread of diseases like **Ebola** and **Zika** that cross borders and strengthen our country's health security by focusing on pathogens that could be used in a bioterrorist event, like **anthrax** and **plague**.



# NCEZID Around The World

## Impact Highlights





## Indonesia

### IMPACT:

Indonesia is universally acknowledged as a likely hot spot for emerging, **vector-borne viruses** with pandemic potential. In 2012, NCEZID began helping Indonesia build its first molecular laboratory for diagnosing emerging viruses, now one of the best in Southeast Asia. It made the first confirmations of **West Nile** and **Zika** viruses in the archipelago, alerting officials to potential outbreaks. Now CDC and Indonesia are building a surveillance system around this new lab capacity to determine which vector-borne viruses are making people sick and stop them before disease spreads.

## Around the World

### IMPACT:

Medical screening for people before coming to live in the United States saves money and protects their health, and that of American communities. NCEZID develops the guidelines for the medical exams that are required for all US-bound immigrants and refugees.

## Cameroon

### IMPACT:

In 2016, NCEZID scientists trained their Cameroon colleagues to detect, test, and control **monkeypox**, caused by a virus in the same genus as the virus that causes smallpox. This training was applied a few months later when a serious outbreak of monkeypox surfaced among chimps at a primate conservation center. NCEZID deployed epidemiologists to assist Cameroon in their effective containment of the virus. Our recommendations led to better infection control to ensure that any future outbreaks are contained quickly and safely.

## India

### IMPACT:

NCEZID and India are laying the foundation for stopping the spread of **antimicrobial resistance** (AMR). In 2016, CDC helped expand national AMR surveillance to 13 labs in India and helped institutions within India measure AMR trends, prevent healthcare-associated infections, and improve antibiotic use. Data from the labs and networks will inform India's national treatment guidelines, a critical step for combating AMR. These efforts lay the foundation for long-term, data-driven programs to stop the spread of AMR in India.

## Ethiopia

### IMPACT:

In 2015, NCEZID facilitated a workshop in Ethiopia to assist government officials in prioritizing the 5 zoonotic diseases of greatest national concern. Using workshop results, Ethiopia is creating and implementing strategies to address the prioritized diseases and establishing proven prevention programs, such as vaccine programs. We continue to work with Ethiopia on prevention and control for these dangerous pathogens to ensure that future outbreaks are contained quickly before they cross borders.

## Brazil

### IMPACT:

NCEZID quickly developed two new tests that could detect Zika virus in tissues. In late 2015, tissue samples from two newborns who died within hours of birth and two miscarriages were submitted to CDC from Brazil. NCEZID scientists used the new tests to confirm the tissues were positive for Zika. This evidence led CDC to conclude that Zika causes **microcephaly**, and embark on critical research to protect pregnant women in the U.S. and around the world.

## Uganda

### IMPACT:

In 2010, NCEZID and partners established the first national **viral hemorrhagic fever (VHF)** surveillance and lab program in Uganda. This lab allows quicker testing so response teams can be deployed rapidly. In the 10 years prior to the program, only 3 VHF outbreaks were detected, with an average of 187 cases per outbreak. Since the program began, 10 outbreaks, including Ebola, Marburg, Crimean-Congo hemorrhagic fever and Rift Valley fever, have been detected with an average of only 7 cases per outbreak. This program has dramatically improved Uganda's capacity to detect and respond to VHFs, reducing illness and saving lives.

## Sierra Leone

### IMPACT:

During the **2014 Ebola outbreak**, NCEZID worked with Sierra Leone to fast-track development of a national program to decrease the spread of Ebola in healthcare facilities. The program's success led Sierra Leone to bolster 25 government hospitals and 14 districts with trained infection prevention staff, ensuring that infection prevention and control remain a priority in healthcare.

# Preparing for the Next Outbreak: NCEZID's Role

Today, disease threats spread faster and more unpredictably than ever before. **NCEZID** experts are focused on preparing the U.S. and our global partners to respond to a range of potential threats.

## Combatting Global Antimicrobial Resistance

High levels of **antimicrobial resistance** (AMR) have been found in all regions of the world, threatening our ability to treat common infections. NCEZID is joining forces with world leaders, non-governmental organizations, private industry, and public health organizations to develop solutions to combat this urgent and growing threat.

In 2016, CDC and NCEZID leadership met with world leaders at the United Nations General Assembly to reinforce the importance of global action to fight AMR and the threat it poses to development goals and modern medicine.

NCEZID is working with federal and international partners to increase 1) information exchange, 2) understanding of best approaches for use of antimicrobial drugs, and 3) prevention of healthcare and community associated drug-resistant infections.

NCEZID is also working to expand public health laboratory capacity to 15 partner countries to identify priority pathogens with antimicrobial resistance and report results to international surveillance networks.

## Developing New and Better Technologies

Protecting Americans and people around the world demands that we develop and deploy better **diagnostics, vaccines, and innovative prevention solutions**. Scientists responding to outbreaks abroad need faster and more accurate technologies, like those that use whole genome sequencing. The growing threat of vector-borne disease demands that we have tests that can distinguish between diseases with similar symptoms (like Zika, dengue, and chikungunya), but that require different treatments.

## Prioritizing Zoonotic Diseases

A **One Health** approach promotes multi-disciplinary collaboration across human, animal, and environmental health sectors to achieve optimal health outcomes for both people and animals. As an example, CDC's One Health experts are working to globally implement a **One Health Zoonotic Disease Prioritization process** so that limited resources can be focused on those zoonotic diseases of greatest national concern. CDC scientists will assist these countries to develop effective control and prevention strategies to mitigate their greatest zoonotic disease threats.



The *Aedes aegypti* mosquito can spread Zika, dengue, chikungunya, and other viruses.

## IMPROVING THE U.S. RESPONSE TO VECTOR-BORNE DISEASE

Recent outbreaks of **Zika**, **chikungunya**, and **dengue** highlight the increasing threat of vector-borne disease to the U.S. and its territories from other parts of the world. CDC is at the forefront of developing a coordinated strategy to increase our understanding of these diseases, advance tools to combat vector-borne diseases, and help states prevent, detect, and respond to vector-borne threats.