



Emerging and Zoonotic Infectious Diseases

Chris Braden, MD
Deputy Director

Denise Cardo, MD
Director, Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

New Health Official Orientation

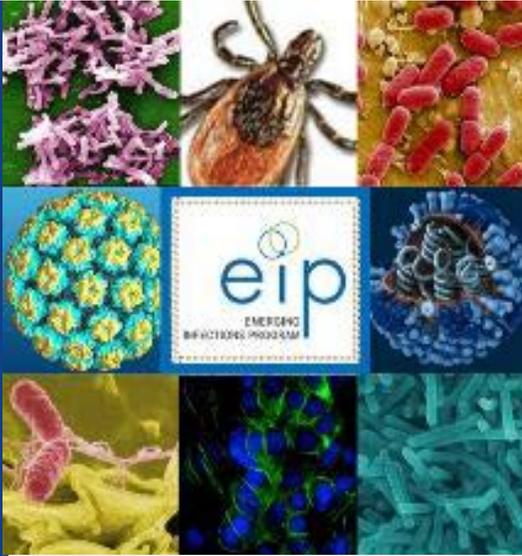
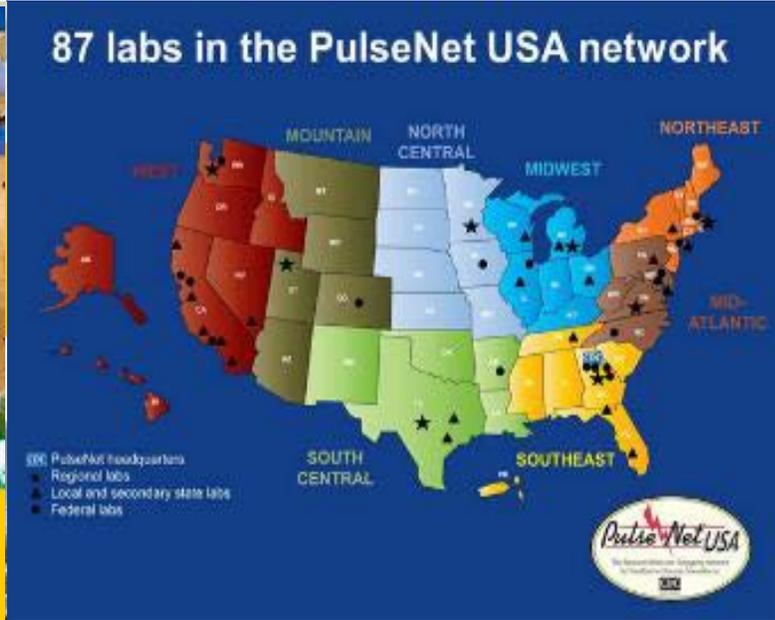
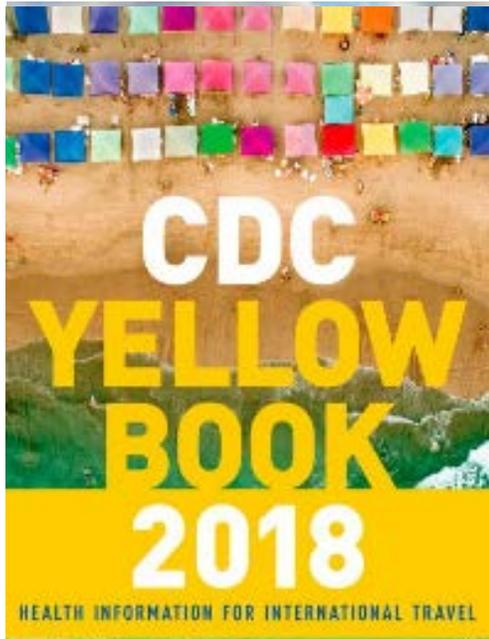
May 1, 2018

NCEZID: Protecting People from Infectious Disease



- Foodborne, waterborne, and fungal illnesses
- Vector-borne diseases -- spread by mosquitoes, ticks, and fleas
- Healthcare-associated infections
- Antibiotic-resistant infections
- Illnesses that affect immigrants, migrants, refugees, and travelers
- Deadly diseases like anthrax and Ebola
- Advanced Molecular Detection

Signature Programs



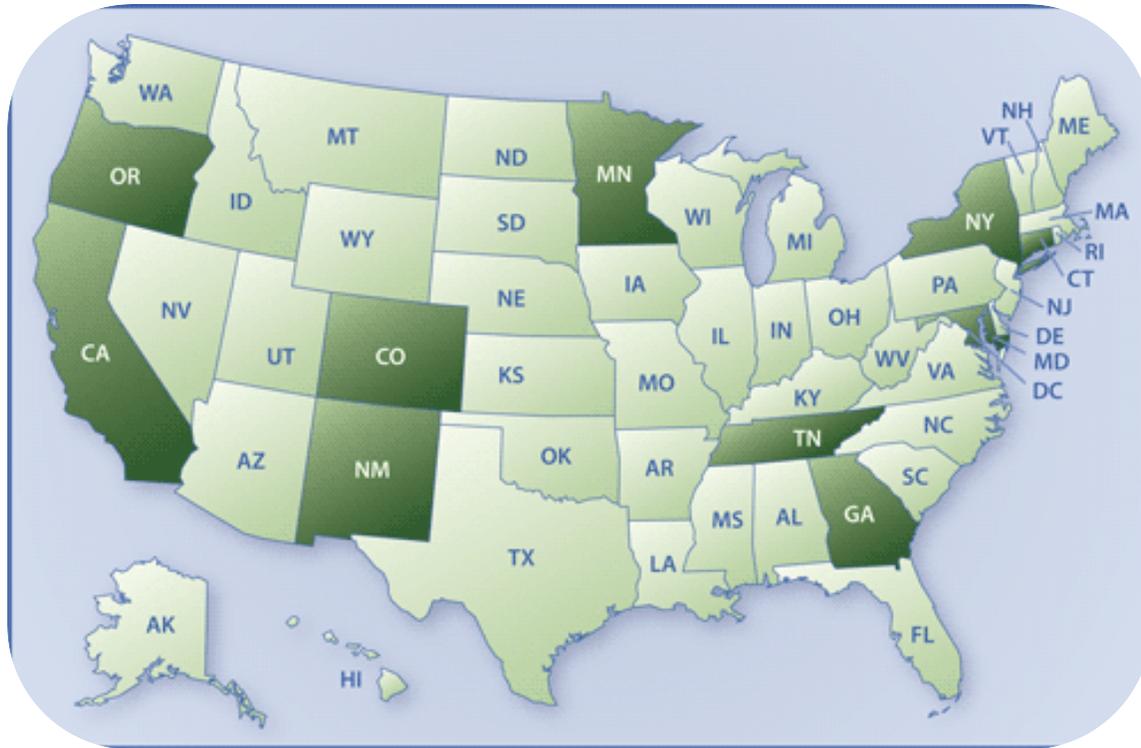
Strengthening State and Local Capacity (ELC)

Epidemiology and Laboratory Capacity Grants

- ELC: CDC's national funding strategy for combatting domestic infectious disease threats
 - *Strengthen* epidemiological capacity
 - *Enhance* laboratory capacity
 - *Improve* health information systems
- Support to 64 health departments in states, large cities and territories for >20 infectious disease programs (e.g., flu, foodborne, healthcare-associated infections)



Emerging Infections Program (EIP)



- Network of 10 state health departments and university partners
- Translates gold-standard surveillance into policy and public health practice
- Examples:
 - Active Bacterial Core surveillance (ABCs)
 - FoodNet
 - Influenza activities
 - HAI and antimicrobial resistance

Responding to Outbreaks in the United States

- NCEZID works with states to investigate many infectious disease outbreaks each year
- Example of 2018 multistate outbreak investigation:
 - In April, worked with states to identify a fast-moving outbreak of Shiga toxin-producing *E. coli* O157:H7 infections linked to chopped romaine lettuce
 - Rapid response: just 8 days from first PulseNet coding/detection to posting public warning
 - As of April 18: 53 people infected (31 hospitalizations, no deaths) in 16 states



Image of chopped romaine lettuce

Other examples of NCEZID assisting states in investigations since January 2018:

- **West Virginia:** Rash illness and respiratory symptoms among healthcare workers and other employees at an acute-care hospital.
- **Illinois:** Undetermined source of staphylococcal scalded skin syndrome among infants in a neonatal intensive care unit.
- **Florida:** Helped track down Swiss couple exposed to rabid bat
- **Multiple states:** Several salmonellosis outbreaks linked to kratom, chicken salad, frozen shredded coconut
- **Multiple states:** Shiga toxin-producing *E. coli* O157:H7 infections linked to leafy greens

US public health emergency responses

Zika

- EOC response deactivated in Sept 2017, but Zika remains potential public health threat
- Zika Coordination and Operations Transition Team (ZCOTT)



Hurricanes: Infectious Disease Task Force

- Significant damage to PRDH and CDC lab facilities
- Assisting PRDH with lab testing (e.g., leptospirosis), restoring epi and lab capabilities
- Enhancing mosquito surveillance and vector control

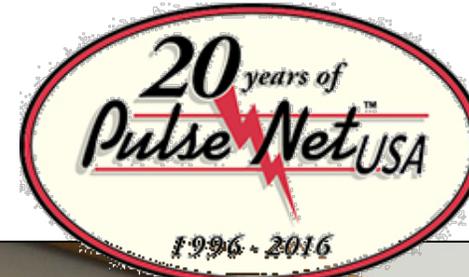


NCEZID Laboratories – A Critical Public Health Resource

NCEZID manages a broad array of specialized labs and nationwide lab networks.

Examples:

- PulseNet: U.S. lab network that detects foodborne disease outbreaks, prevents 270,000 illnesses each year
- Laboratory Response Network: Responds quickly to biological threats and other public health emergencies
- Infectious Disease Pathology Lab: Conducts specialized studies of human tissues and diseases of unknown origin
- Biotech Core Facility: Provides advanced sequencing and other technology support
- High-Containment Lab: Conducts research on BSL-4 pathogens (e.g., Ebola)

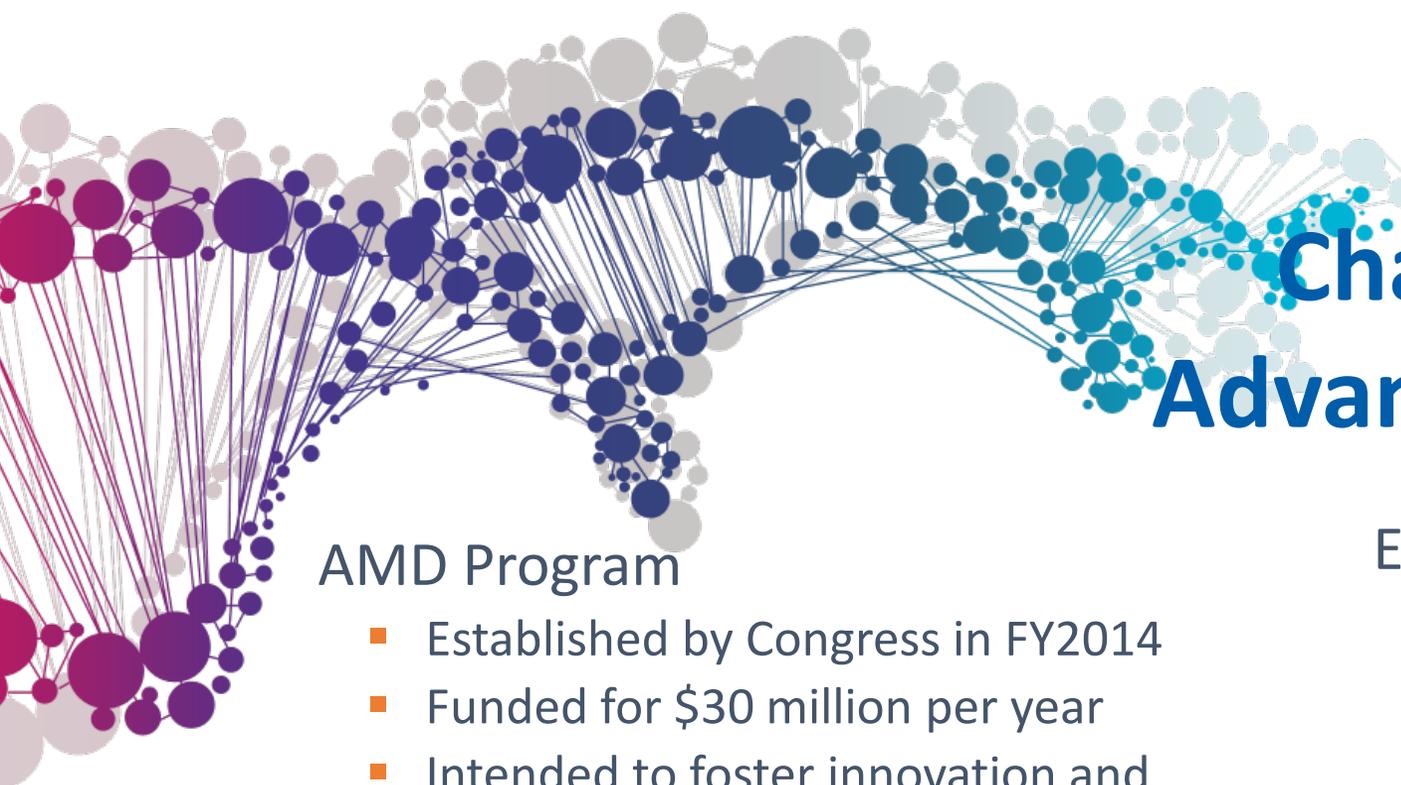


MicrobeNet

Improving Patient Outcomes by Helping Laboratories Match Test Results

- Online database of over 2,400 rare disease-causing microbes
- Includes
 - Genetic sequence information
 - Biochemical characterization
 - Morphological characterization
 - Antibiotic resistance profiles
- Allows global comparison of diagnostic tests against CDC's unique collection of pathogens





Championing Innovation: Advanced Molecular Detection

AMD Program

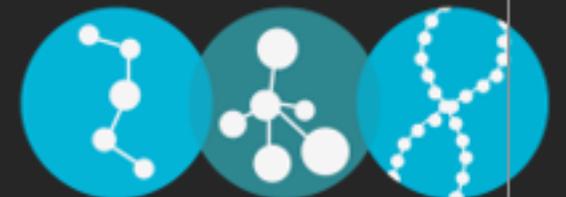
- Established by Congress in FY2014
- Funded for \$30 million per year
- Intended to foster innovation and modernization

AMD combines

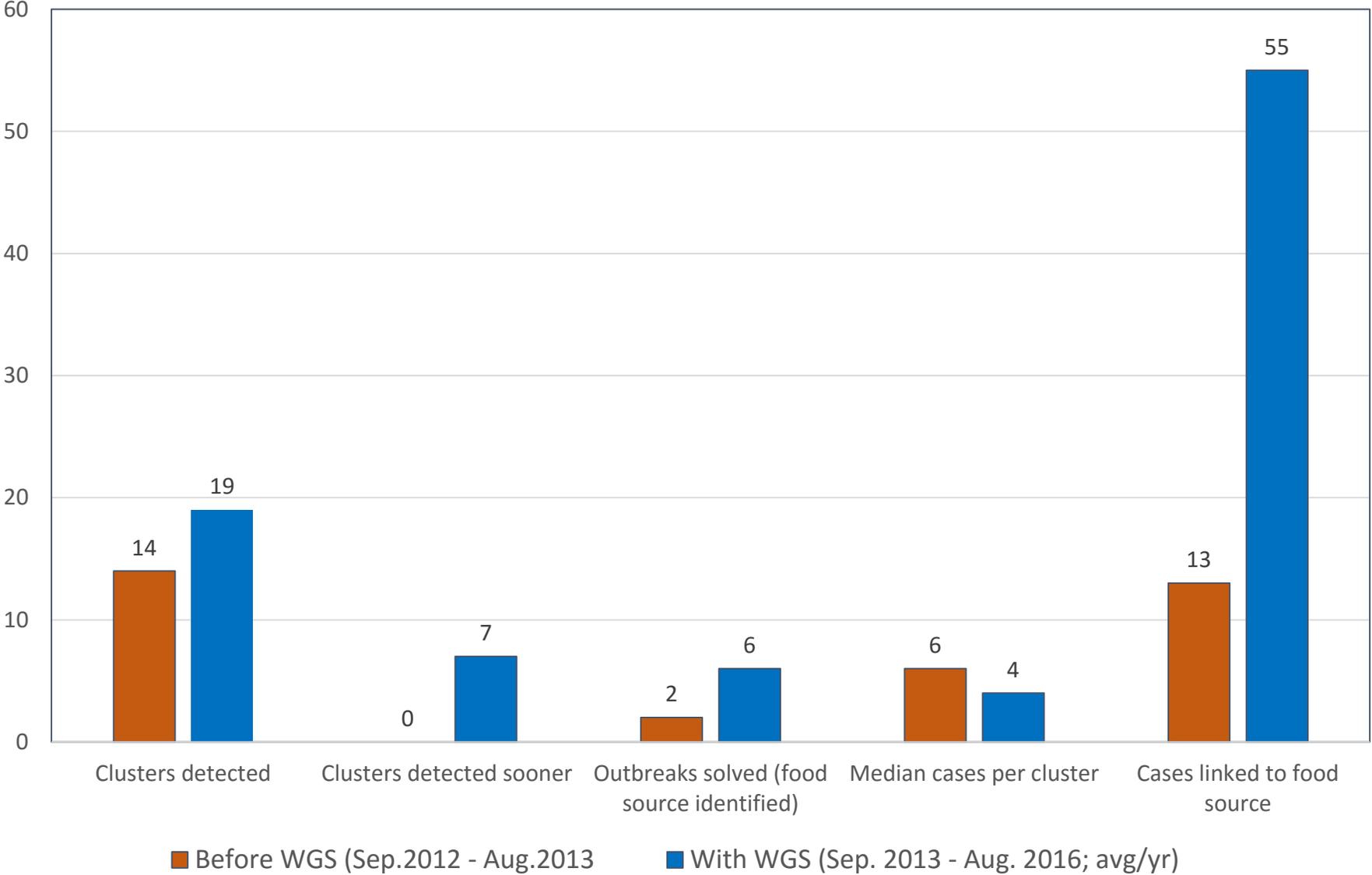
- Traditional epidemiology
- Next-generation genomic sequencing
- Bioinformatics

Examples of AMD in action

- Rapid development of Zika virus diagnostic protocol
- Tracing connections of an HIV outbreak in Indiana
- Surveillance of influenza strains for vaccine development
- Tracking emergence of *Candida auris* strains



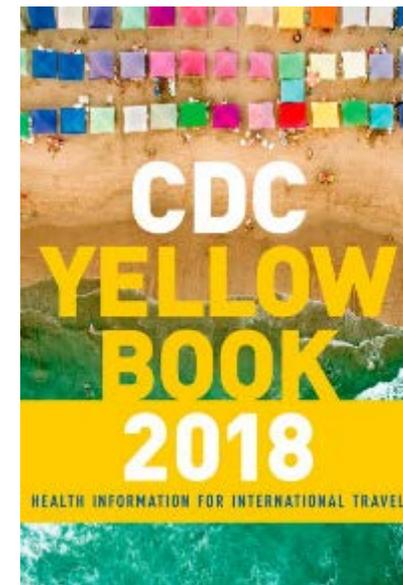
U.S. Listeria Outbreaks, Before and After AMD



Source: Jackson BR. Clin Infect Dis 2016;63:380-6; and CDC/OID/NCEZID/DFWED

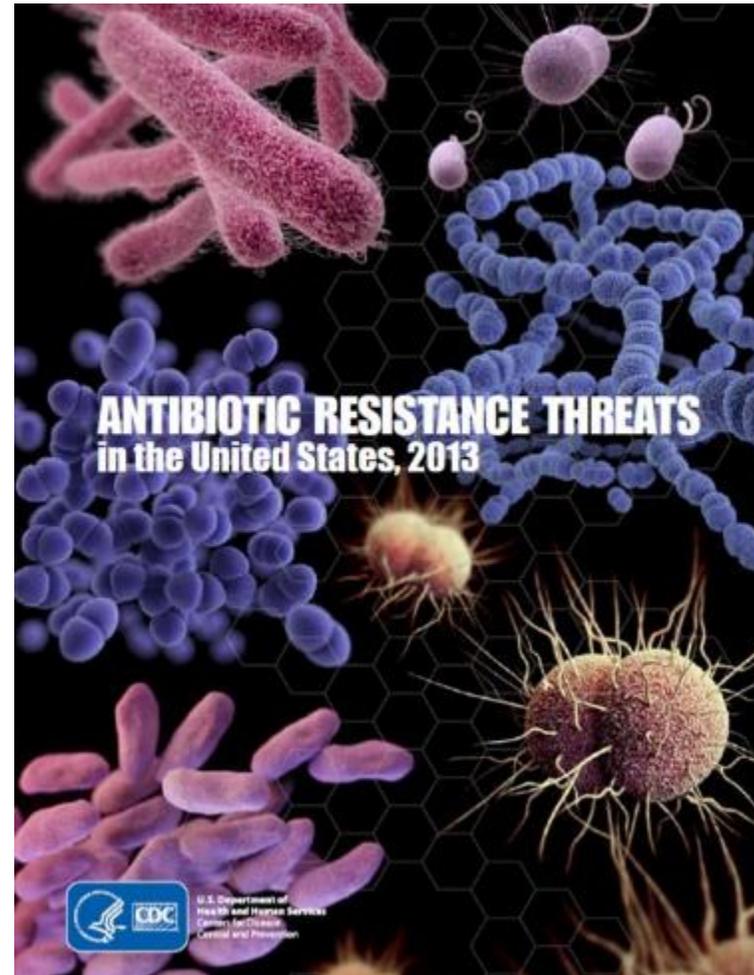
Protecting Against Importation of Infectious Diseases

- Quarantine Stations at 20 U.S. Ports of Entry
- Final Rule for Control of Communicable Diseases became effective in 2017
 - Improves CDC's ability to protect against introduction and spread of communicable diseases
- Travelers' Health - U.S. residents traveling abroad
- Immigrant, refugee, and migrant health – guidelines, screen/treat, track diseases



Antibiotic Resistance: An Emerging Threat

- Sickens **>2 million** people and kills at least **23,000** people each year
- **>\$20 billion** each year in healthcare costs
- Threatens modern medicine – if we lose antibiotics, we lose the ability to treat patients with sepsis and cancer, provide organ transplants and save victims of burns and trauma
- Need to act now or even drugs of last resort will soon be ineffective



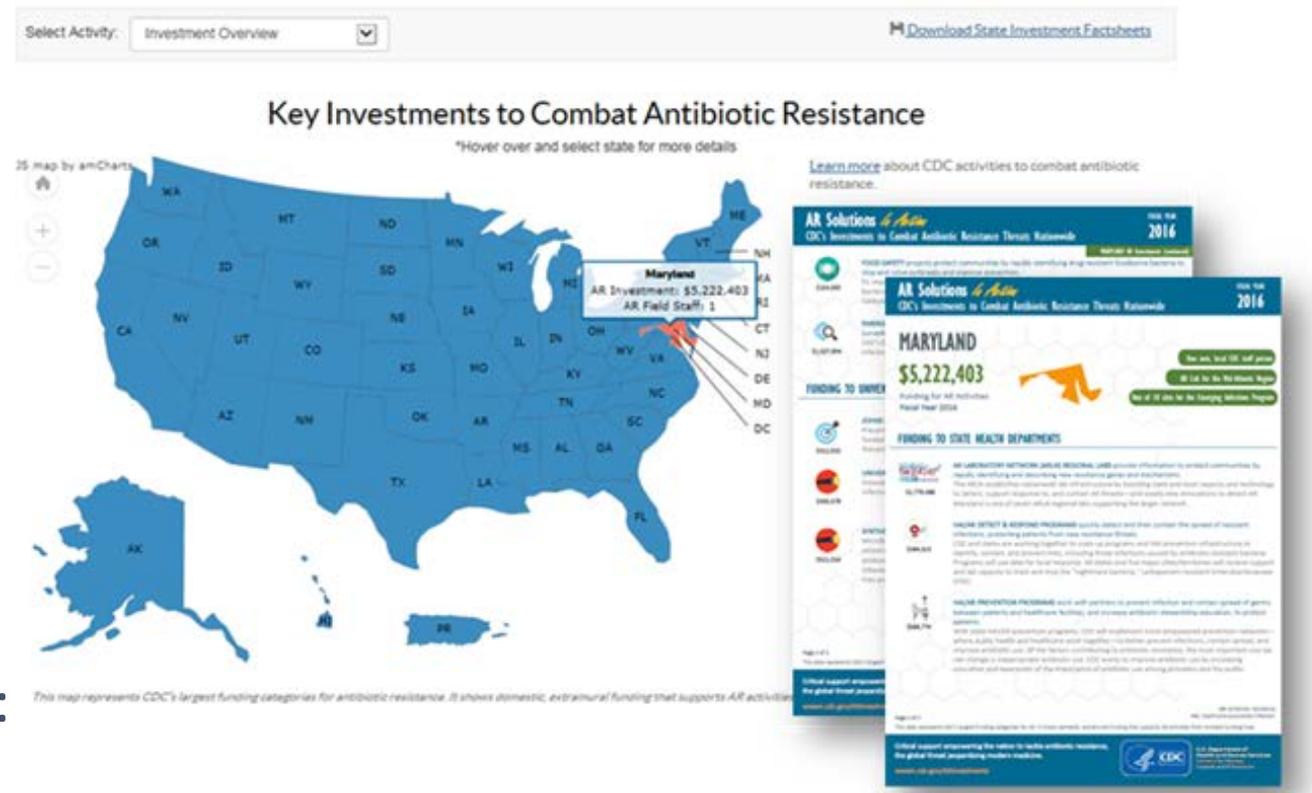
New Drugs Alone Aren't Enough to Protect Americans

Combating AR requires comprehensive, aggressive action across the U.S. gov't and around the globe



To Combat AR and Protect the United States, CDC is Working in Your State and Community

- Investments with partners to transform how the U.S. fights AR and slow resistance at all levels
- \$160M in FY 2016 AR investments to detect, respond, contain, prevent, and innovate
- Built AR Laboratory Network
- Support provided to every state
- See the interactive AR investment map: <https://wwwn.cdc.gov/arinvestments>



AR Impacts Everyday Americans

Acting locally to prevent infections now and always



Alicia Cole, CA



Nile Moss, CA



Dana Mirman, FL



Peggy Lillis, NY



Catherine Duff, Indiana



Joshua Nahum,
Colorado

Engage with Us

www.cdc.gov/ncezid
[@CDC_NCEZID](https://twitter.com/CDC_NCEZID)

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



FY 2018 Appropriations

- FY 2018 spending bill for CDC includes \$614.572 million for NCEZID, an increase of about \$30 million above FY 2017.
- Increases for NCEZID include:
 - \$12.193 million more for vector-borne diseases
 - \$8.457 million more for emerging infectious diseases
 - \$5 million more for antibiotic resistance
 - \$4 million more for food safety
- Additionally, \$480 million has been appropriated for construction of a new BSL-4 lab and associated infrastructure.