

MARYLAND

\$8,161,961

Funding for AR Activities
Fiscal Year 2017



1 local CDC AR expert and 1 CDC fellow

Regional Lab for the AR Lab Network (Mid-Atlantic)

One of 10 sites for the Emerging Infections Program

HIGHLIGHTS

Candida auris, a resistant fungus that can cause deadly infections, was identified in Maryland. CDC provides resources to identify and contain resistant infections, like *C. auris*. After it emerged in the U.S. in 2016, the AR Lab Network regional labs began providing specialized testing to states fighting new threats.

FUNDING TO STATE HEALTH DEPARTMENTS



\$1,779,488

AR LABORATORY NETWORK REGIONAL LABS boost state and local testing capacity and technology to detect, support response to, and prevent AR threats across the nation—and inform new innovations to detect AR.

Maryland is home to one of the AR Regional Labs performing specialty testing on pathogens like drug-resistant gonorrhea. In 2016, Maryland's regional lab began a pilot study to help identify genetic predictors of gonorrhea resistance in the U.S. The pilot matches resistance data from traditional and slower phenotypic testing methods with new data from whole genome sequencing, a faster type of testing. Using this data, lab experts will be able to more rapidly identify unique resistance patterns, develop new treatment guidelines and prevent future outbreaks.



\$440,071

RAPID DETECTION & RESPONSE to emerging drug-resistant germs is critical to contain the spread of these infections.

With 2016 funding, Maryland further developed its lab testing capacity to detect the "nightmare bacteria" CRE by dedicating staff, crafting standard testing procedures, and validating additional testing methods. With this enhanced capacity, Maryland tested 847 isolates in 2016.



\$588,773

HAI/AR PREVENTION works best when public health and healthcare facilities partner together to implement targeted, coordinated strategies to stop infections and improve antibiotic use.

With 2016 funding, Maryland's HAI/AR program has worked with its Emerging Infections Program, state public health lab and Prevention Epicenter to pilot a *Clostridium difficile* prevention "bundle"—a combined set of interventions to improve patient outcomes.



\$243,989

FOOD SAFETY projects protect communities by rapidly identifying drug-resistant foodborne bacteria to stop and solve outbreaks and improve prevention.

Maryland implemented whole genome sequencing of *Listeria*, *Salmonella*, *Campylobacter* and *E. coli* isolates submitted to its lab and began uploading sequence data into PulseNet for nationwide monitoring of outbreaks and trends. In Fiscal Year 2018, Maryland will begin simultaneously monitoring these isolates for resistance genes. When outbreaks are detected, local CDC-supported epidemiologists investigate the cases to stop spread.



\$50,000

GONORRHEA RAPID DETECTION & RESPONSE works with state and local epidemiology and laboratory partners to test for and quickly respond to resistant gonorrhea to stop its spread in high risk communities.

Only one treatment option remains for gonorrhea and resistance continues to grow.

MARYLAND AR Investments (continued)



\$984,549

EMERGING INFECTIONS PROGRAM (EIP) sites improve public health by translating population-based surveillance and research activities into informed policy and public health practice.

CDC's EIP network is a national resource for surveillance, prevention and control of emerging infectious diseases—like antibiotic-resistant bacteria and fungi. Learn more: www.cdc.gov/nceid/dpei/eip.

FUNDING TO UNIVERSITIES & HEALTHCARE PARTNERS



\$1,443,315

JOHNS HOPKINS UNIVERSITY: Discovering & Implementing What Works

Early onset sepsis (EOS), a sign of severe infection, in newborn children is thought to be associated with bacteria transmitted from normal maternal vaginal and gut flora during the birth process. However, in some resource limited settings, highly resistant gram-negative bacteria, traditionally associated with healthcare settings, have been described in EOS. Investigators will study how these highly resistant bacteria spread between mothers, newborns and the environment to develop strategies that can prevent sepsis during infancy.



\$868,315

JOHNS HOPKINS UNIVERSITY: Discovering & Implementing What Works

Antibiotic resistance in healthcare settings, including neonatal intensive care units (NICUs), is a significant threat to public health around the world. Investigators will work with hospitals in India to determine cost-effective, innovative and sustainable interventions to prevent bloodstream infections and improve neonatal survival in NICUs in low and middle-income countries.



\$431,747

UNIVERSITY OF MARYLAND, BALTIMORE: Innovative Prevention & Tracking

Researchers will conduct a pilot study (small-scale study that helps design larger studies) on the use of additional gowns and gloves in nursing homes to prevent the spread of *Staphylococcus aureus* infections.



\$860,796

OPGEN, INC.: Innovative Prevention & Tracking

This project will modify a commercial cloud and mobile-based software platform, which integrates electronic patient data and local treatment guidelines, to support antibiotic stewardship and infection control in low- and middle-income countries. Investigators will translate the software to Spanish and use it in up to three medical sites internationally. Implementers will assess factors such as cost, clinical impact and feasibility.



\$283,462

J. CRAIG VENTER INSTITUTE: Innovative Prevention & Tracking

Researchers will develop a comprehensive gene and protein database and web-based resource that public health experts can use to quickly detect and identify antibiotic resistance genes as they emerge.



\$47,456

JOHNS HOPKINS CLINICAL MICROBIOLOGY LABORATORY: Discovering & Implementing What Works

In collaboration with CDC, researchers are developing and testing the Direct MacConkey method. This test can quickly (i.e., from 3-4 days to 2 days) identify patients carrying the "nightmare bacteria" CRE and recover the bacteria for better outbreak response.



\$140,000

ASSOCIATION OF PUBLIC HEALTH LABORATORIES (APHL): Global Expertise & Capacity Enhancements

CDC's global work to combat AR prevents the importation of AR threats into the United States. Experts are working to enhance laboratory strengthening activities in Senegal.