

P2861 The Antibiotic Resistance Laboratory Network (AR Lab Network): Improving nationwide public health capacity to detect and contain carbapenemase-producing organisms - United States, 2017–2018

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Background: In 2016, the US Centers for Disease Control (CDC) began funding 56 public health laboratories (PHLs) across the country to characterize antibiotic-resistant clinical isolates, including carbapenem-resistant Enterobacteriaceae (CRE), *Pseudomonas aeruginosa* (CRPA), and *Acinetobacter baumannii* (CRAB) as part of the Antibiotic Resistance Laboratory Network (AR Lab Network). Here we describe the network's infrastructure, the resultant data output, and its application for detecting, containing, and preventing novel and emerging carbapenem resistance in the United States.

Materials/methods: PHLs conducted organism identification, antimicrobial susceptibility (AST), carbapenemase production, and PCR for KPC, NDM, OXA, VIM, and IMP carbapenemase genes on CRE and CRPA isolates. Seven regional laboratories additionally tested CRAB isolates for carbapenemases and screened rectal swabs for colonizing carbapenemase-producing organisms (CPOs) using the Cepheid GeneXpert Carba-R. PHLs alerted local public health officials within 1 day of detecting CPOs or isolates with *mcr* or suspected pan-resistance in order to initiate immediate containment activities. PHLs reported monthly testing summaries to CDC. CDC conducted supplemental AST, PCR, and/or whole genome sequencing (WGS) on isolates with novel mechanisms or pan-resistant profiles.

Results: From January 2017 through October 2018, 52 of 56 funded laboratories implemented testing and reporting to CDC. These include 47/50 states, 4 large cities, and Puerto Rico. The AR Lab Network has tested 28,466 carbapenem-resistant isolates, of which 38.0% (6,332/16,670) of CRE, 2.8% (302/10,692) of CRPA, and 5.2% (57/1,104) of CRAB isolates were CPOs. Among 8,472 colonization screens performed, 11% were CPO-positive. Among all 36,938 specimens, 1,873 (5%) met criteria for immediate containment. CDC provided over five times as many AR containment consultations to healthcare facilities and public health partners compared with the year before AR Lab Network testing began. New testing protocols have been deployed throughout the network in response to novel findings, emerging resistance mechanisms, and evolving needs, such as performing AST of new-to-market drugs.

Conclusions: The AR Lab Network has vastly improved our ability to detect and contain high-priority resistance mechanisms throughout the United States. These investments in nationwide infrastructure for testing and reporting have proven to be both robust and flexible to incorporate new technology and adapt to new discoveries.

