

This work was written as part of one of the author's official duties as an Employee of the United States Government and is therefore a work of the United States Government. In accordance with 17 U.S.C. 105, no copyright protection is available for such works under U.S. Law.

Public Domain Mark 1.0

<https://creativecommons.org/publicdomain/mark/1.0/>

Access to this work was provided by the University of Maryland, Baltimore County (UMBC) ScholarWorks@UMBC digital repository on the Maryland Shared Open Access (MD-SOAR) platform.

Please provide feedback

Please support the ScholarWorks@UMBC repository by emailing scholarworks-group@umbc.edu and telling us what having access to this work means to you and why it's important to you. Thank you.

ORAL ABSTRACTS

1800. Phenotypic Definitions for Identifying Carbapenemase-Producing Carbapenem-resistant Enterobacteriaceae

Nora Chea, MD^{1,2}; Sandra N. Bulens, MPH²; Thiphassone Kongphet-Tran,²; Valerie Albrecht,²; Ruth Lynfield, MD³; Kristin M Shaw, MPH, CIC³; Marion Kainer, MBBS, MPH⁴; Daniel Muleta,⁴; Lucy Wilson, MD⁵; Elisabeth Vaeth, MPH⁵; Ghinwa Dumyati, MD⁶; Cathleen Concannon, MPH⁷; Erin C. Phipps, DVM⁸; Karissa Culbreath, PhD⁹; Sarah Jackson Janelle, MPH¹⁰; Wendy Bamberg, MD¹⁰; Alexander Kallen, MD, MPH¹; ¹Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, GA; ²Centers for Disease Control and Prevention, Atlanta, GA; ³Minnesota Department of Health, St. Paul, MN; ⁴Tennessee Department of Health, Nashville, TN; ⁵Maryland Department of Health and Mental Hygiene, Baltimore, MD; ⁶University of Rochester Medical Center, Rochester, NY; ⁷New York Rochester Emerging Infections Program at the University of Rochester Medical Center, Center for Community Health, Rochester, NY; ⁸New Mexico Emerging Infections Program, Albuquerque, NM; ⁹Pathology, University of New Mexico Health Sciences Center, Albuquerque, NM; ¹⁰Colorado Department of Public Health and Environment, Denver, CO

Session: 227. New Insights into the Prevention and Control of MDR GNR
Saturday, October 11, 2014: 2:00 PM

Background. Evidence suggests that much of the increase in carbapenem-resistant Enterobacteriaceae (CRE) in the U.S. is due to the spread of carbapenemase-producing (CP) strains. However, resistance mechanism testing is not widely used. A phenotypic definition that reliably identifies CP-CRE could help target prevention.

Methods. *Escherichia coli*, *Enterobacter spp.*, and *Klebsiella spp.* isolates that were nonsusceptible to any carbapenem based on local laboratory results were collected from six Emerging Infections Program sites. Isolates underwent susceptibility testing and PCR for the most common U.S. carbapenemases (KPC, NDM, IMP, VIM, OXA-48). The proportion of false positives (FP) (i.e., met phenotypic definition but not CP-CRE), and false negatives (FN) (i.e., did not meet phenotypic definition but was CP-CRE) were calculated for ten phenotypic CRE definitions that included a variety of carbapenem and 3rd and 4th generation cephalosporin susceptibility patterns. Phenotypic definitions with FP ≤ 35% and FN ≤ 6% were considered acceptable and further stratified by organism.

Results. Overall, 212 isolates were included, of which 50 (24%), 84 (40%), and 78 (36%) were *E. coli*, *Klebsiella spp.* and *Enterobacter spp.*, respectively. Seventy-four (35%) were KPC-CRE (5 *E. coli*, 57 *Klebsiella spp.*, 12 *Enterobacter*) and five (2%) were NDM-CRE (5 *Klebsiella spp.*). The proportion of FP and FN for the ten phenotypic definitions ranged from 17% to 48% and 1% to 11% respectively. Two phenotypic definitions met criteria for further evaluation including: 1). Current CDC phenotypic definition – nonsusceptible to any carbapenem (excluding ertapenem) and resistant to all 3rd generation cephalosporins tested (FN = 4%, FP = 31%) and 2). Resistant to any carbapenem (excluding ertapenem) (FN = 6%, FP = 18%). *Klebsiella* had a higher proportion of FN and lower proportion of FP than *E. coli* or *Enterobacter*.

Conclusion. No phenotypic definition perfectly identifies CP-CRE; the proportion of FP and FN also might vary by organism. Two phenotypic definitions appeared to have a potentially acceptable proportion of FP and FN and might be useful to target CRE surveillance and prevention efforts; however, testing across a broader group of sites and carbapenemases is needed.

Disclosures. All authors: No reported disclosures.