



Six Months of Surveillance for Carbapenem-Resistant *Enterobacteriaceae* (CRE) in Maryland

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BACKGROUND

- Maryland performed CRE surveys in 2010 and 2011, and began participating in the Emerging Infections Program MuGSI surveillance in 2012.
- In September 2013 the Centers for Disease Control and Prevention (CDC) named Carbapenem-resistant *Enterobacteriaceae* as one of the top three urgent antibiotic resistance threats to public health.
- On November 7, 2013 the Maryland Department of Health and Mental Hygiene made CRE a reportable condition statewide. All clinical laboratories in the state are required to report cases of any species of *Enterobacteriaceae* from any body site that is nonsusceptible to a carbapenem and resistant to all third-generation cephalosporins tested, or that tests positive for a carbapenemase. Clinical laboratories are also required to submit isolates to the Maryland State Public Health Laboratory.

METHODS

- Analysis restricted to non-duplicate patients and to cases meeting CDC's definition for CRE:
 - non-susceptible to doripenem, imipenem or meropenem AND
 - resistant to all third-generation cephalosporins tested.
- Data reported are from November 7, 2013 to May 7, 2013.

Figure 1. Maryland CRE Cases and Rates per 100,000 Residents

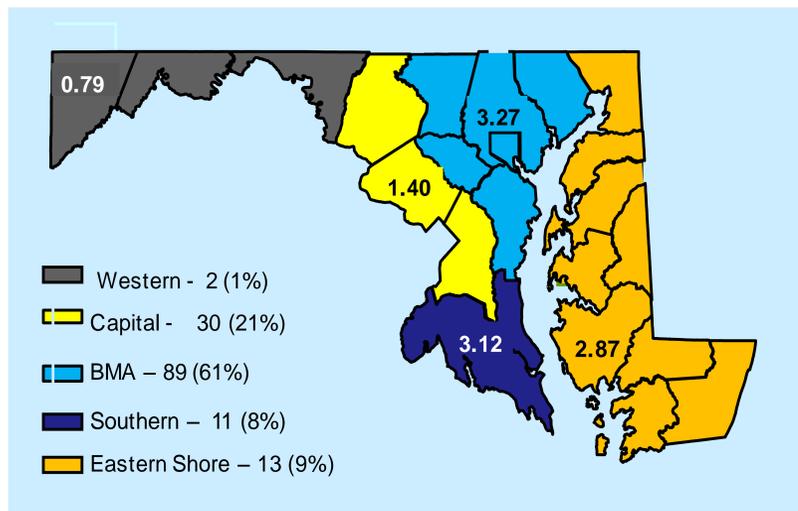
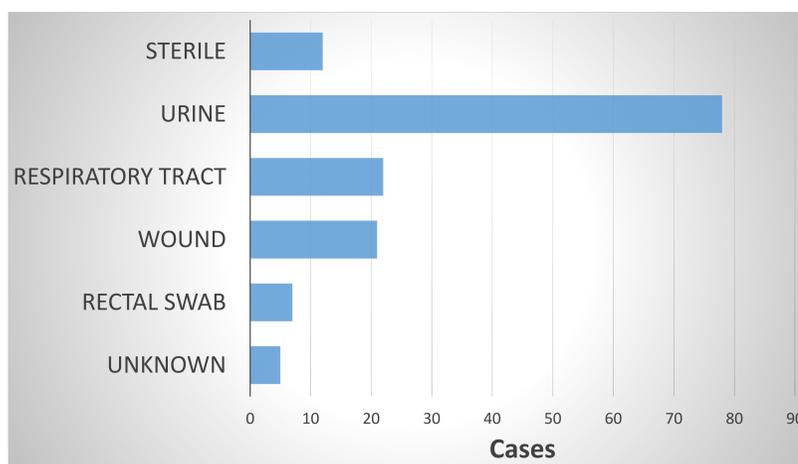


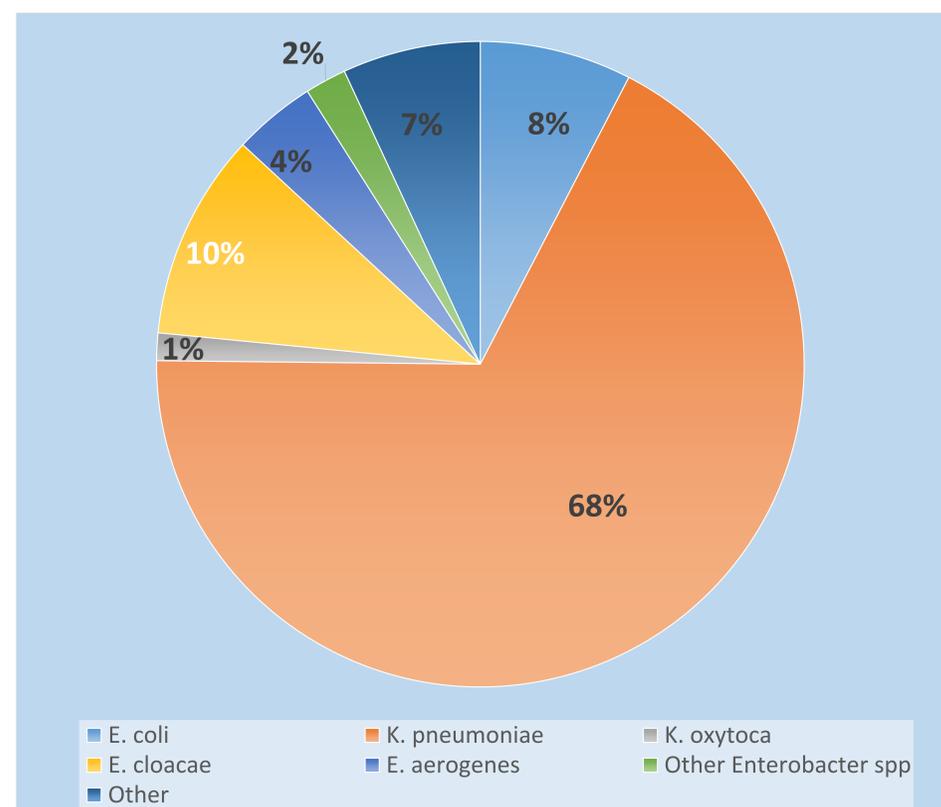
Figure 2. Maryland CRE by Body Site



RESULTS

- 145 CRE reported between November 7, 2013 and May 7, 2014.
- Cases occurred in acute care hospitals, long term acute care hospitals and long term care facilities.
- Majority of cases (61%) occurred in patients residing in the Baltimore Metro Area (BMA).
- Rates per 100,000 residents ranged from a high of 3.27 in the BMA to a low of 0.79 in Western Maryland.
- 54% of cases were isolated from urine but cases were reported from a variety of body sites including sterile sources.
- *Klebsiella pneumoniae* was the most frequently reported but 15 separate species of *Enterobacteriaceae* were reported.
- Most cases (53%) occurred in adults over 65 years of age; another 39% occurred in adults aged 35-64 and the remaining 8% were from adults aged 18-34. No pediatric cases were reported.

Figure 3. Maryland CRE by Organism



CONCLUSIONS

Statewide surveillance has shown that CRE is well-established in Maryland. While DHMH's guidance to healthcare must reflect this knowledge, it is not too late to work towards a reduction in the incidence and transmission of CRE in the state. Much of Maryland's CRE burden is from urine. Surveillance data does not differentiate between symptomatic infection and colonization, but it is reasonable to assume that some CRE in urine is colonization only. Given this limitation, and recognizing that urine may be a frequent source of transmission, physicians and infection preventionists must carefully consider how to manage CRE in urine. Maryland's antibiotic stewardship efforts must also emphasize reducing unnecessary antibiotic use across healthcare settings to reduce the threat of CRE.

NEXT STEPS

- Complete molecular characterization of Maryland's first year of CRE isolates to better understand the prevalence of various carbapenemases in the state.
- Revise MD's surveillance definition to most accurately capture carbapenemase-producing organisms in the state.
- Work with state healthcare facilities, including long term care facilities, to better control the spread of CRE through improved inter-facility communication, travel-appropriate screening and effective infection prevention.
- Consider issuing treatment guidelines for CRE isolated from urine.
- Work with neighboring state health departments to better understand regional trends in CRE.

Figure 4. Maryland CRE by Age and Gender

