Carbapenem-resistant Enterobacteriaceae (CRE) are an urgent threat with mortality rates of up to 40% for bloodstream infections. Meaningful visualizations of CRE and carbapenemase-producing CRE (CP-CRE) are needed for situational awareness among healthcare facility and public health (PH) staff involved in a regional approach to prevention.

### Background
- Data were obtained from the state integrated disease surveillance system.
- US Census Bureau 2015 population estimates were used for denominators in calculating incidence rates.
- A pre-webinar survey was distributed to a focus group of healthcare and PH staff to gain feedback on sample maps depicting fictional CRE data.
- Data were displayed using different time intervals (i.e., monthly, quarterly, annually) and stratified by organism (i.e., E. coli, Enterobacter spp., Klebsiella spp.).
- Maps were created using ArcMap 10.3.1 (Esri, CA).
- Final maps were discussed at a CRE Visualization Focus Group Webinar in which participants included infection preventionists, laboratory, pharmacy, local/regional PH staff, and physicians.

### Methods
- Preferred maps showing 12 month incidence rates (Fig. 1), updated every 6 months, overlaid by gradient bubbles showing number of infections within the last 30 and 90 days (Fig. 2).
- Suggested the minimum time-frame for displaying incidence rates be per quarter (Fig. 3).
- Wanted maps to show Emergency Medical Services (EMS) regional boundaries because these reflect catchment areas.
- Wanted tables listing number of CRE and CP-CRE cases by state of residence and healthcare facility where cases were identified in last 30 and 90 days to be updated monthly.

### Figures
- **Figure 1.** Incidence rates of CRE (Klebsiella spp., E. coli, and Enterobacter spp.) per 100,000 residents by county, TN 2015.
- **Figure 2.** Incidence rates of KPC producers (Klebsiella spp., E. coli, and Enterobacter spp.) per 100,000 residents by county and number of cases in the last 30 and 90 days as of March 31, 2016.
- **Figure 3.** Annualized quarterly incidence rates per 100,000 residents by county for KPC positive Enterobacter spp. in 2015, by quarter.

### Results
- Hosting a focus group aided immensely in determining optimal ways to present CRE and CP-CRE data to healthcare and PH professionals in Tennessee to provide regional situational awareness.

### Conclusions
- Data were obtained from the state integrated disease surveillance system.
- US Census Bureau 2015 population estimates were used for denominators in calculating incidence rates.
- A pre-webinar survey was distributed to a focus group of healthcare and PH staff to gain feedback on sample maps depicting fictional CRE data.
- Data were displayed using different time intervals (i.e., monthly, quarterly, annually) and stratified by organism (i.e., E. coli, Enterobacter spp., Klebsiella spp.).
- Maps were created using ArcMap 10.3.1 (Esri, CA).
- Final maps were discussed at a CRE Visualization Focus Group Webinar in which participants included infection preventionists, laboratory, pharmacy, local/regional PH staff, and physicians.

### Contact Information
- Marion Kainer, MBBS MPH
- Tennessee Department of Health
- HAI.Health@tn.gov

### Figures
- [Figure 1](#)
- [Figure 2](#)
- [Figure 3](#)