## Trends in the Incidence of Carbapenem-Resistant Enterobacterales (CRE) and Carbapenemase Producing CRE (CP-CRE) in Davidson and Surrounding Counties, Tennessee, 2016-2021

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## Background

- > The spread of **Carbapenem-resistant** Enterobacterales (CRE) and carbapenemase producing CRE (CP-CRE) continue to be a public health threat.
- > Tennessee monitors the trends of CRE and **CP-CRE** cases since 2011.
- > Tennessee also participates in **Multidrug-Resistant** Gram-Negative Bacilli Surveillance Initiative (MuGSI) since 2014 as part of the CDC's **Emerging Infections Program (EIP).**
- > We collected available **CRE** isolates to test for carbapenemase production.

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- > A population-based surveillance was conducted targeting selected CRE.
- > A CRE incident case was defined as a new isolation of *E. coli*, *Klebsiella* pneumonia, Klebsiella oxytoca, Klebsiella aerogenes and Enterobacter cloacae complex resistant to <a>1</a> carbapenem from urine or normally sterile sites in a surveillance area.
- CRE reports were obtained from laboratories, antibiotic testing instrument queries, electronic lab report (ELR) and faxed paper reports from the treating facilities.
- > The Tennessee state public health laboratory tests for carbapenemase production (CP) on CRE isolates received from the clinical laboratories.
- > The data analysis was done using SAS software version 9.4.

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## Methods

## The Surveillance Catchment Area





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benemase Production Positivity Rate, 2016-2020						
	Number tested positive for CP	positivity in percent	Odds ratio in reference to the 2020 rate	95% confidence interval		P- value
	5	13.9	1.42	0.38	5.32	0.60
	17	28.8	3.56	1.21	5.2	0.02
	17	26.6	3.18	1.08	9.36	0.03
	11	14.3	1.49	0.49	4.58	0.49
	5	10.0	1.0	Reference		
	17	25.8	3.05	1.04	8.96	0.04

## **Discussion and Conclusions**

The transmission of CP-CRE cases decreased during the years prior to the COVID-19 outbreak despite the steady increase in CRE cases. Continued testing isolates for carbapenemase production is crucial to identify the trends and magnitude of the transmission of carbapenemase producing CREs. A disruption in infection prevention practice led to a surge of highly antimicrobial resistant organisms that are known to cause healthcare associated infections. The transmission of CP-CRE gained momentum during the COVID outbreak as evidenced by a significant increase in infection rate and carbapenemase production positivity rate in 2021. Renewed focus on implementing coordinated infection prevention strategies is likely to contribute to reducing the spread of CP-CRE as well as other antimicrobial-resistant pathogens.

### Acknowledgment

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