

Identifying Geographical Hotspots and At-Risk Populations of *Clostridioides difficile* Infection

Using 2020 Health data from the CDC Incident Case Detection System

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Background

Clostridioides difficile Infection (CDI):

- ❖ Bacterial infection that results in diarrhea and colitis
- ❖ The most common microbial cause of healthcare-associated infections in U.S. Hospitals.
- ❖ Estimated 500,000 illness and 15,000 deaths yearly.
- ❖ Yearly surveillance is used to follow trends, reduce outbreaks and educate communities of prevention tools.

Transmission

- Oral Route
- Fecal Route

Treatment & Prevention

- Good Hygiene
- Antibiotics
- Fecal microbiota transplant
- Surgical removal of colon

Risk Factors

- Older age (65+)
- Previous C.Diff Infections
- Weakened Immune System
- Overuse of Antibiotics
- Recent Hospitalization

Research Objectives

The aim of this project was to:

- ❖ Comprehend Tennessee's CDI surveillance process.
- ❖ Develop data visualization skills using Tableau.
- ❖ Analyze the CDC's Health Data to the create visualizations of the demographics and hotspots within Davidson, Tennessee.

Methods

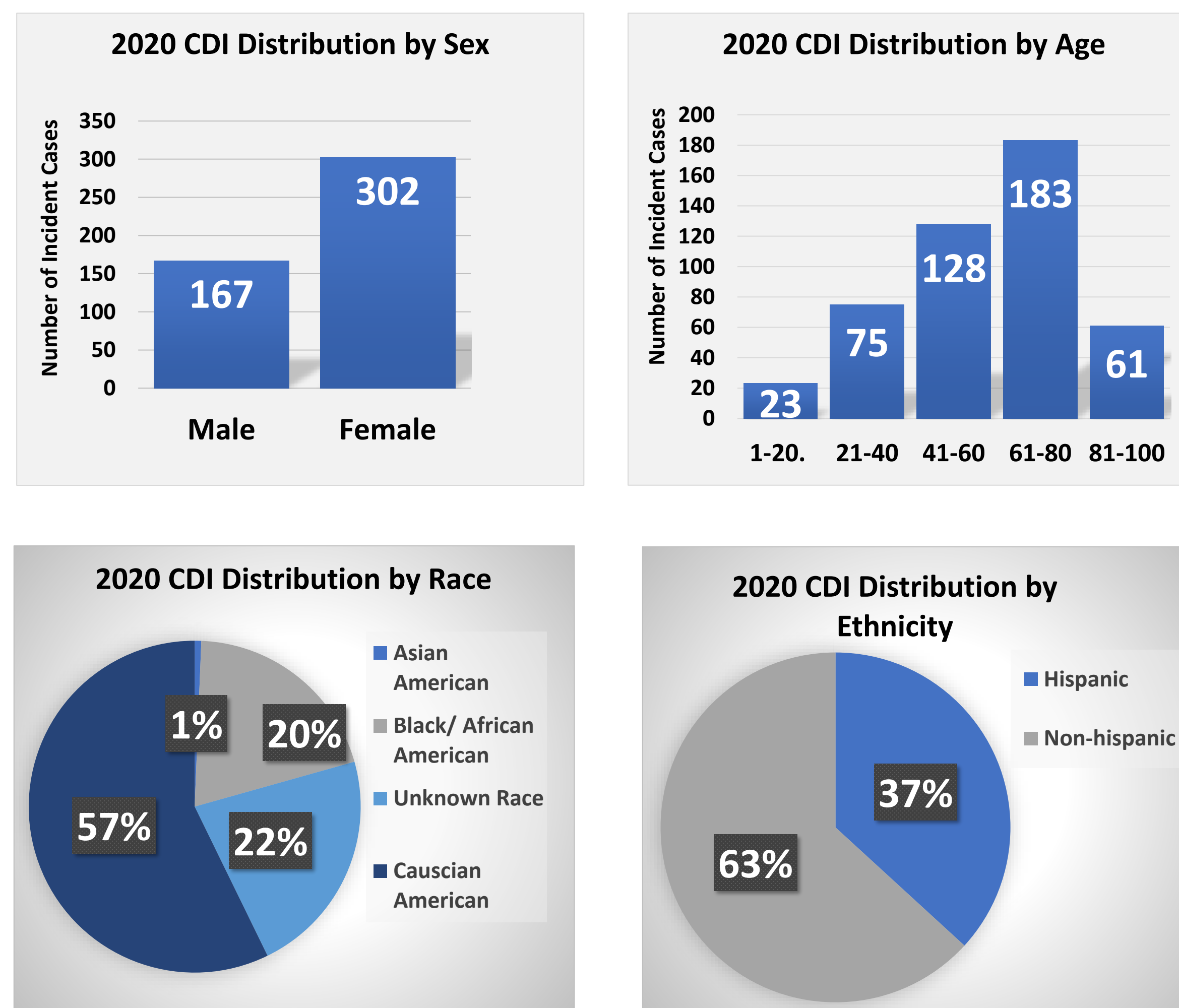
1. Merged data from the CDC's Incident case detection system and ArcGIS data from the CDC's Incident case management system in excel.
2. Labelled parameters as either a measure or a dimension in Tableau.
3. Set filters to display age, sex, gender, race, zip code, treatment method, facility treatment type, and epidemiological classification.

Methods

4. Pie charts, tables, and bar and line graphs were created to display the traits and demographics.
5. Density maps were created to display hotspots, and restricted to the catchment area, with county borders and names.

Results

Demographics and Traits

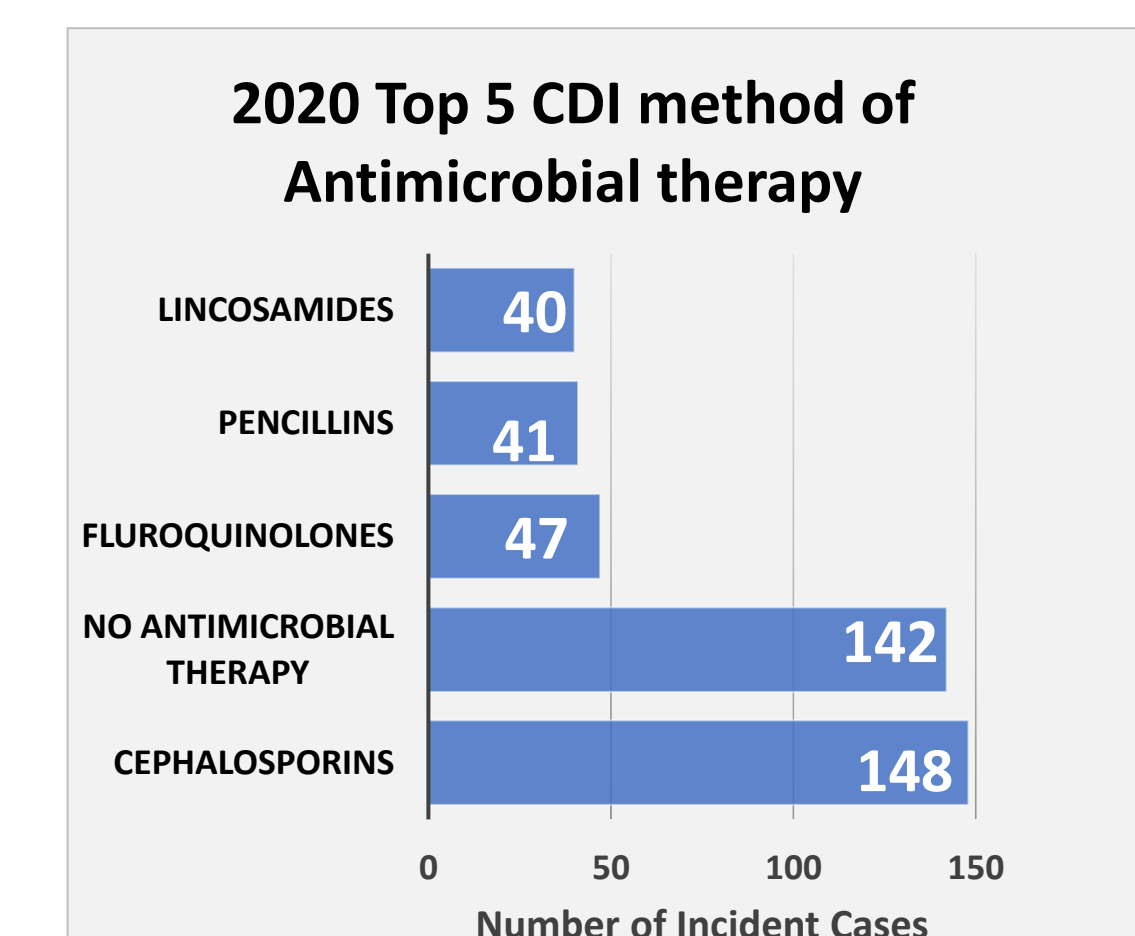
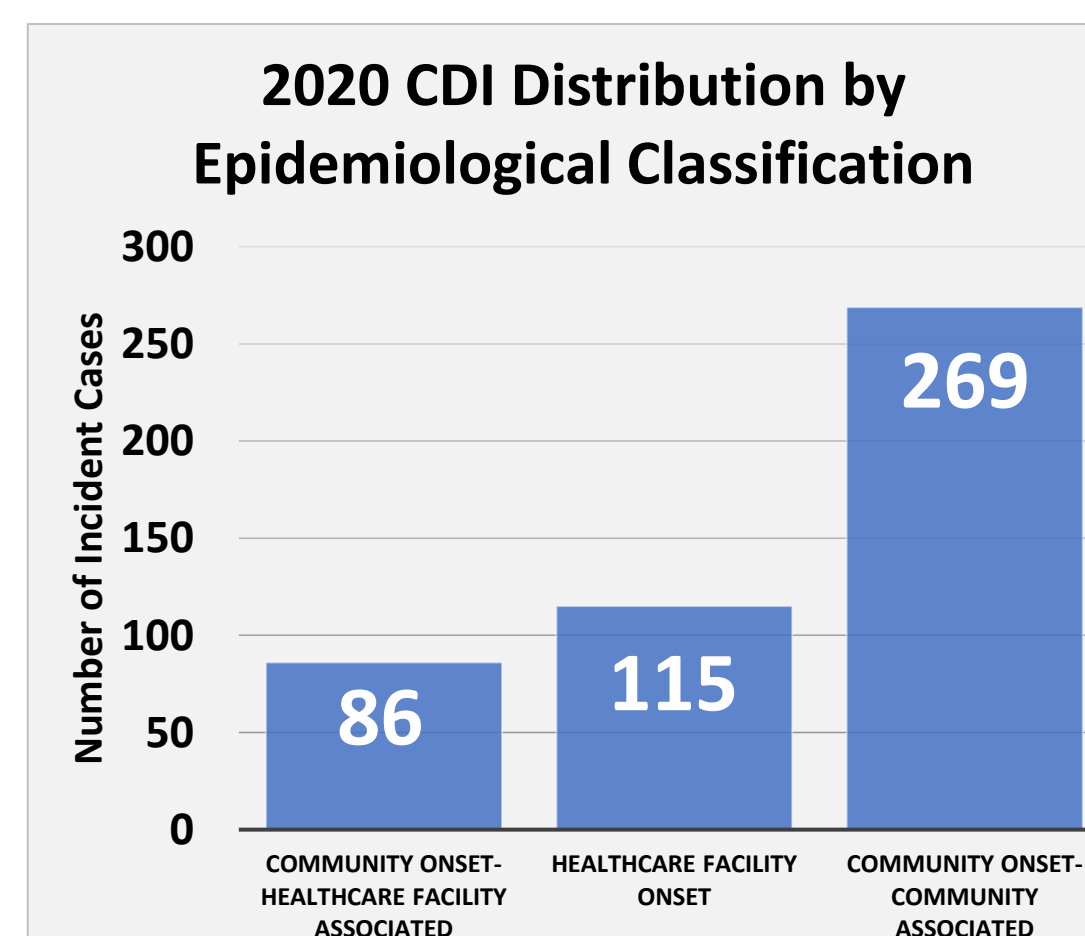


Facility Treatment Types

Facility Treatment Type	Number of Incident Cases
Long Term Care Facility	38
Outpatient	177
Acute care Hospital	284

Medications*

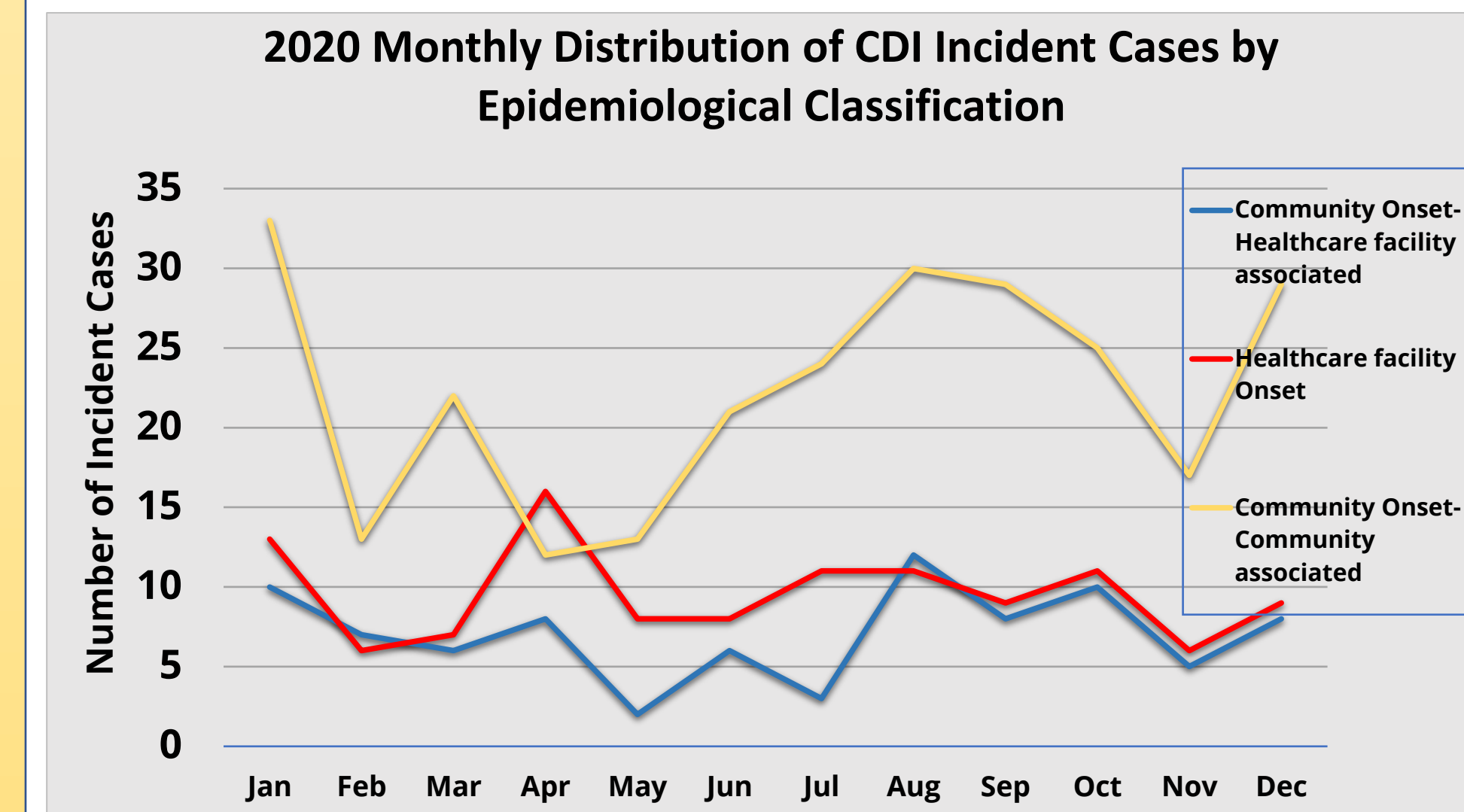
Medication	Number of Incident Cases
Other CDI Medications	4
Fidaxomicin	6
Metronidazole	10
Vancomycin	21



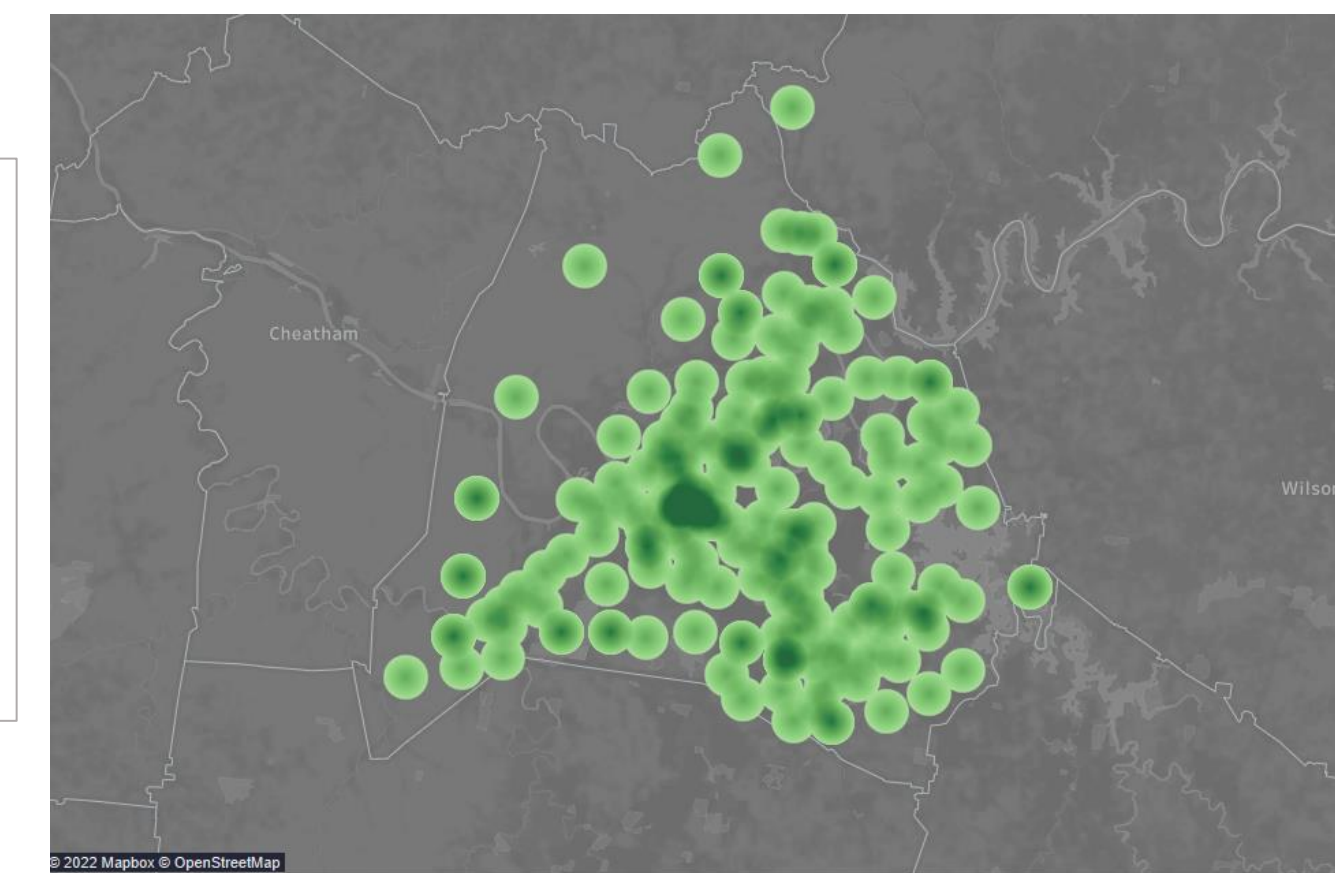
*These were previously suspected or confirmed CDI case medications. They were taken in the 12 weeks before the date of incident *C.diff* stool collection

Results

Traits and Geographical location



Density Map of the 2020 CDI Distribution by zip code within Davidson County



Conclusion

- ❖ Older white non-Hispanic females are at greater risks.
- ❖ Treatment is mostly found at Acute care hospitals (57%).
- ❖ Most common susceptibility risk factors are Cephalosporins(24%).
- ❖ Community Onset-Community Associated accounts for the largest cases of CDI at 57%.
- ❖ The 2020 Data is consistent with Tennessee's past 3 years of CDI data.
- ❖ The central region of Davidson County is the most populated with cases.

Acknowledgements

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