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Identifying Geographical Hotspots and At-Risk Populations of *Clostridiodes difficile* infection



Introduction: The Centers of Disease and Control and Prevention (CDC) considers *C.diff* the most common microbial cause of healthcare associated infections in the United States hospitals, which results in high cost and burden on the health care system. Resources from the Healthcare Associated Infections program at The Tennessee Department of Health (TDH) were used to create a visualization project that displays trends and hotspots of *C.diff* Infection (CDI) within Tennessee. This project aims to create a virtual dashboard that depicts the demographics and geographic location of incident cases of CDI that can later be used for to plan, implement, and evaluate efforts to control CDI outbreaks.

Methods: Incident case data was extracted from CDC's Incident Case Detection System and the TDH's Arc geographic and information system, then analyzed and categorized in excel. Data was categorized by epidemiologic classification, race, ethnicity, age, sex, susceptibility factors and zip codes. The cleaned data was then uploaded to Tableau for further analysis and graphics generation.

Results: The most prominent epidemiologic classification for incident cases of CDI were Community Onset-Community Associated (57%), then Healthcare Facility Onset (25%), and lastly Community Onset Healthcare Facility Associated (18%). The population demographics showed that CDI affected majority non-Hispanic, white America females, between the ages 61-80 years old. Furthermore, cases that took Cephalosporins as antimicrobial therapy were at greatest risk of CDI. Lastly, majority of incident cases reside within the central and south-central region of Davidson County.

Conclusions: The overall results aligned with the CDC's and TDH's previous depiction and quantification of CDI incident cases. The elderly population being at risk is likely due to a weakened immune systems and higher frequency of hospital or long-term care facility stays. The overall higher density of people in the central region of Davidson County may play into why there are hotspots of incident cases there.