Results

Fig. 1: CDI Incidence Rate by Year and Epidemiologic Classification

Fig. 2: CDI Incidence Rate by Age Group and Year

Fig. 3: Incidence of CDI Outcomes by Year

Fig. 4: 30-Day CDI Mortality by Age Group and Year

Table 1: Prevalence of CDI-Related Outcomes

Table 2: Prevalence of NAP1/027 Strain

Background and Objectives:
- Clostridioides difficile infection (CDI) incidence, severity, and mortality increased due to the emergence of the epidemic NAP1/027 strain in the early 2000s.
- Decline in the incidence of CDI was reported in the UK in association with a decline in the prevalence of the NAP1/027 strain post-implemention of infection control programs and reduction of high-risk antibiotics.
- We evaluated trends in CDI incidence, hospitalization, mortality, and prevalence of the NAP1/027 strain over time in Monroe County, New York.

Methods
- Active, population and laboratory-based surveillance was conducted in Monroe County residents over 1 year of age (population 739,592) during 2011-2016 as part of the Centers for Disease Control and Prevention Emerging Infections Program (EIP). The catchment area includes 4 hospitals and 34 nursing homes.
- Laboratories used NAAT as part of a single or two-step algorithm for diagnosis. Clinical data including hospitalization (2 days before and 7 days after diagnosis) and mortality was collected from medical records for each CDI case. Additional laboratory data was obtained from vital statistics databases.
- An incident CDI case is defined as a positive C. difficile test from a resident with no positive test in the prior 8 weeks. Recurrence is defined as any positive test within 2 to 8 weeks of a previous positive test.
- Epidemiologic classification of CDI incident cases: Community-associated (CA): no documented overnight stay in a nursing home (NH) or hospital in the 12 weeks prior to a positive C. difficile test. Hospital-onset (HO): a positive C. difficile test > 3 days after admission to a hospital. Nursing home-onset (NHO): a positive C. difficile test collected in a NH or within 3 days after transfer from a NH to a hospital. Healthcare-associated (CO-HCFA): an overnight stay at a NH or hospital in the 12 weeks prior to a positive C. difficile test. Molecular characterization of C. difficile isolates was performed on a convenience sample of positive stool by the CDC laboratory.
- Statistical analysis: Negative binomial regression was used to model CDI incidence, mortality, recurrence, and CDI-related hospitalization rates with adjustment for age, gender, and race. Logistic regression models were applied to model the prevalence of 7-day and 30-day death rates, recurrence, and CDI-related hospitalizations with adjustment for age, gender, and race. Tukey method was used to control for type I error due to multiple testing.

Table 1: Prevalence of CDI-Related Outcomes

Table 2: Prevalence of NAP1/027 Strain

### References

### Conclusion
- From 2011 to 2016, the CDI incidence and mortality rate declined in Monroe County, NY. The decline in incidence was mostly in older adults and in CDI occurring in healthcare facilities. A concurrent decline in the prevalence of the epidemic NAP1/027 strain may have contributed to this decrease however we did not evaluate other potential factors.
- No reduction in the proportion of cases that died or had a recurrence was observed with the decrease in the prevalence of NAP1/027 strain.

### Trends in Clostridioides difficile Incidence, Mortality, and NAP1/027 Strain in the Population of Monroe County, NY

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Table 2: Prevalence of NAP1/027 Strain

- In Monroe County, NY the adjusted CDI incidence decreased by 30% from 253 to 176 per 100,000 population, (p<0.0001) (Fig. 1) when comparing 2011 to 2016.
- The decrease in CDI incidence was significant in adults aged 60-84 (51%, p<0.001) and ≥85 years (45%, p<0.001) (Fig. 2), and in HO (38%, p<0.001) and NHO (62%, p<0.001) (Fig. 1).
- The 30-day mortality rate decreased by 45% from 22 to 12 per 100,000 population (p<0.0001) (Fig. 3), however there was no significant decrease in the 7-day mortality rate (p=0.18).
- There was no significant change in the percent of deaths within 7 and 30 days, or the percent of cases that had a first recurrence (Table 1). However, the proportion of CDI-related hospitalizations significantly increased from 2011 to 2016 (p<0.03).
- The prevalence of the NAP1/027 C. difficile strain decreased from 20% in 2011 to 7% in 2016 (Table 2).