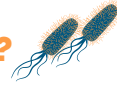


Clostridioides difficile

DEATHS AMONG MICHIGAN RESIDENTS 2015-2019

WHAT IS CLOSTRIDIROIDES DIFFICILE?



Clostridioides difficile (*C. difficile*), previously known as *Clostridium difficile*, is a bacterium that causes a range of disease, from asymptomatic colonization to severe diarrhea, colitis, toxic megacolon, bowel perforation, and death. It is the most common type of healthcare-associated infection (HAI) related to antibiotic use, with estimates indicating that almost half a million infections occur in the U.S. each year. Within one month, 1 in 11 people over age 65 who are diagnosed with a *C. difficile* infection die.

From 2015 to 2019, there were a total of 1,296 deaths for which *C. difficile* played a contributing role. *C. difficile* was the main cause of death for 779 individuals and a related cause of death for 517 individuals.

DATA SOURCES



Data in this fact sheet are taken from the Michigan Resident Death Files for the years 2015-2019, Division of Vital Records and Health Statistics, and the Michigan Department of Health and Human Services (MDHHS). To calculate rates, census data were used from the United States Census Bureau. Data cleaning, formatting, validation, and statistical analysis was done using R studio, a statistical software.

1

Death Rates of *C. difficile* Infection in Michigan, 2015-2019

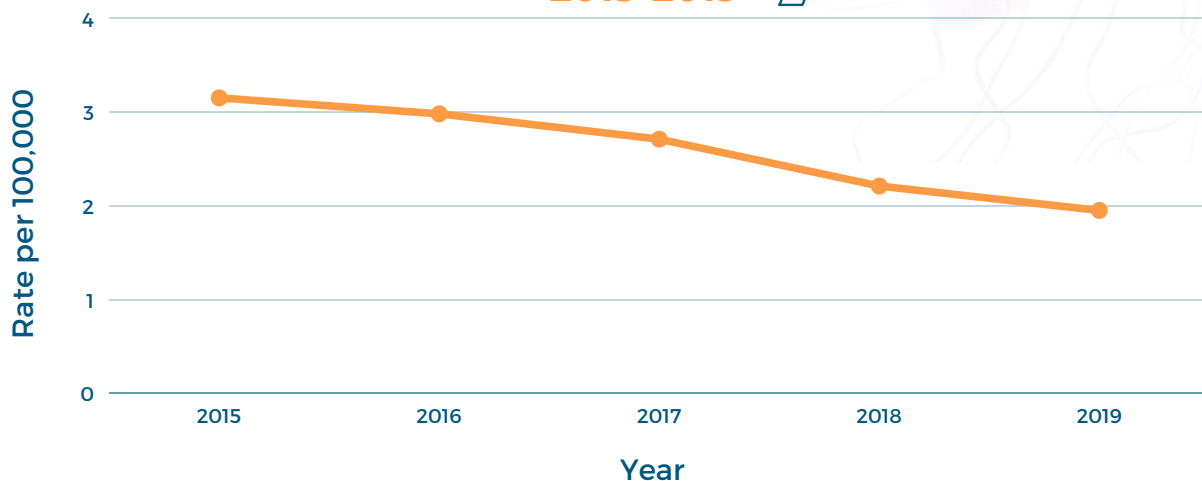


FIGURE 1

C. difficile Death Rates (per 100,000) in Michigan (2015-2019).

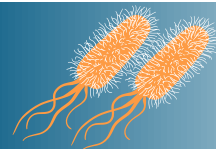
Mortality due to *C. difficile* is steadily decreasing over the 5-year period.



1 in 11 people over 65 years
old die within one month

0.5M

Almost half a million
infections each year



Contagious

2

Death Rates of *C. difficile* Infection in Michigan by Sex, 2015-2019

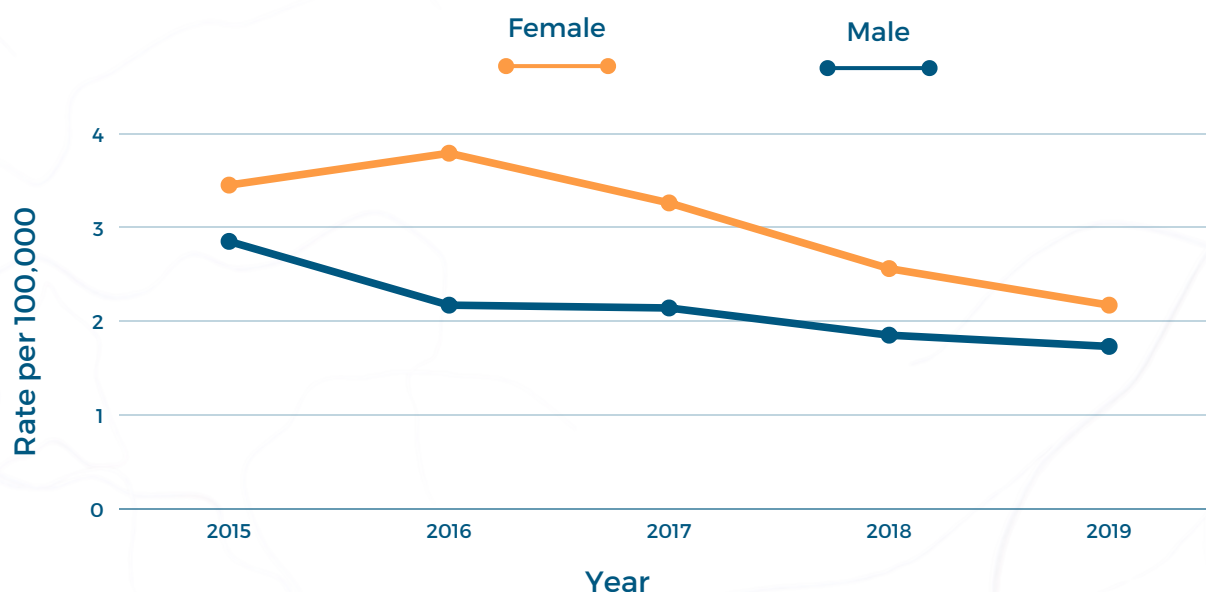


FIGURE 2

C. difficile Death Rates by Sex (per 100,000) in Michigan (2015-2019).

Mortality due to *C. difficile* was higher among females. Some possible risk factors include infant exposure (high *C. difficile* colonization rate population), increased antibiotic use, and host factors related to the immune system.

3

Death Rates of *C. difficile* Infection in Michigan by Age Group, 2015-2019

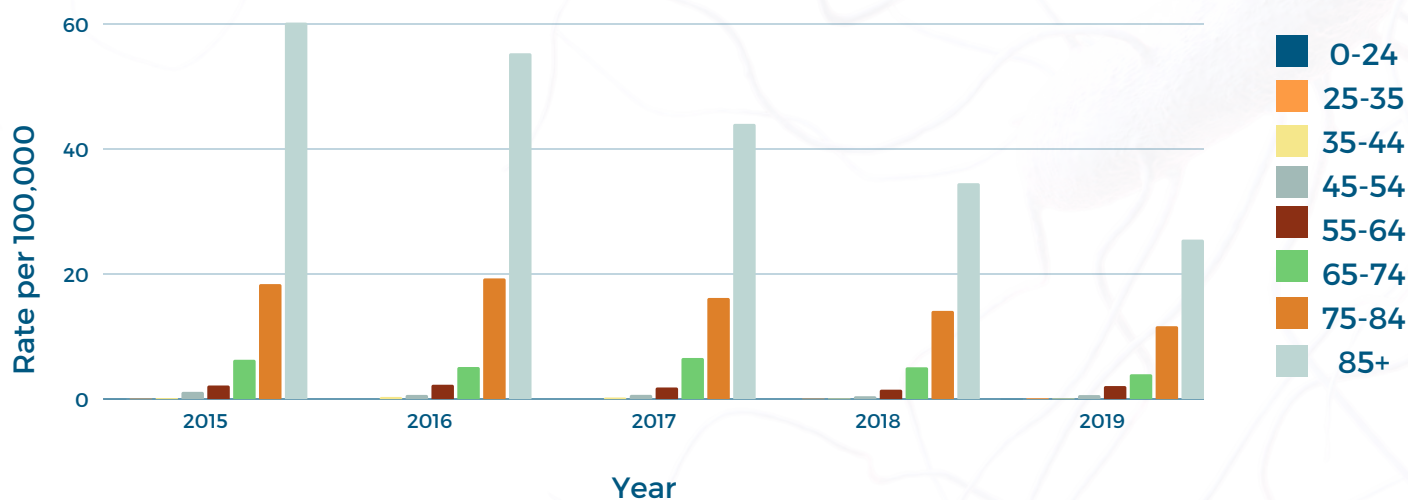


FIGURE 3

C. difficile Death Rates by Age (per 100,000) in Michigan (2015-2019).

Mortality due to *C. difficile* was higher among persons 85+. Some risk factors include increased exposure to healthcare settings, increased antibiotic use, and impaired immune response.

4

Death Rates of *C. difficile* Infection in Michigan by Race, 2015-2019

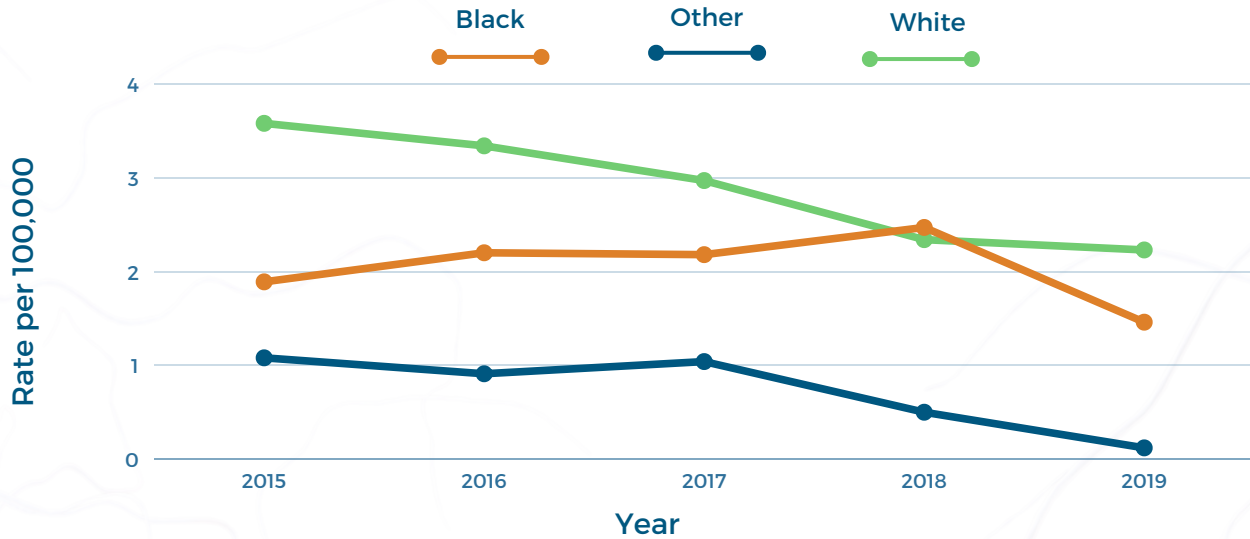


FIGURE 4

C. difficile Death Rates by Race (per 100,000) in Michigan (2015-2019).

For the years observed, mortality due to *C. difficile* was higher among the White population in Michigan, except for 2018, where a slight increase in *C. difficile* deaths in the Black population exceeded the rate of the White population.

5

C. difficile Death Rates in Michigan by County per 100,000 – 2015-2019

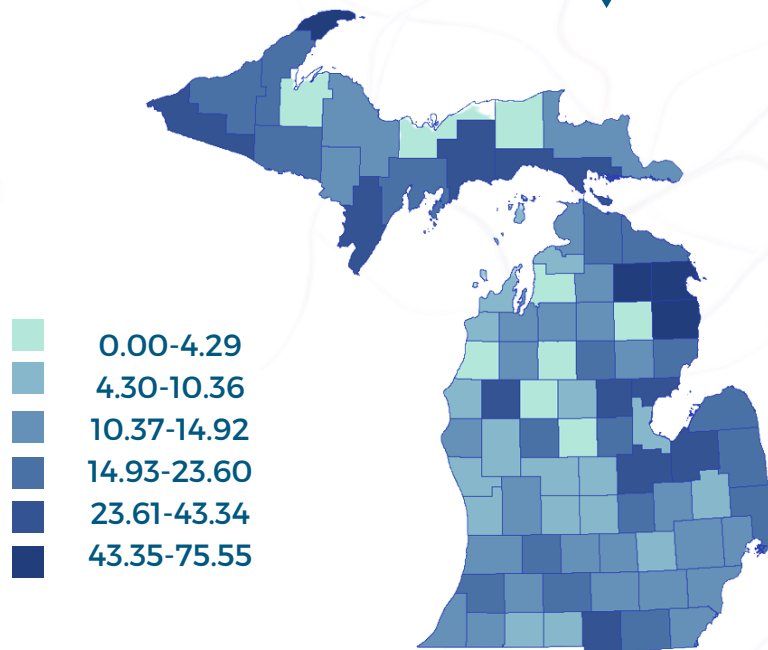


FIGURE 5

C. difficile Death Rates (per 100,000) by Michigan County (2015-2019).

Mortality rates due to *C. difficile* was higher among individuals living in Montmorency, Alpena, Alcona, Keweenaw, and Menominee County. Montmorency County, for example, would experience 78 *C. difficile* deaths per 100,000 people in a 5-year span. In contrast, Wayne County would see 11.27 deaths per 100,000 people over the period of 5 years.

Key Findings

C. difficile deaths were shown to be higher in the following demographics:

- Female
- White
- Older adults
- Individuals living in the following counties:
Montmorency, Alpena, Alcona, Keweenaw, and Menominee

Other risk factors related to *C. difficile* death include hospitalization or extended hospitalization as well as greater access to health care, which resulted in increased antimicrobial exposure (e.g., antibiotics), including diagnostic testing. Further analysis is needed to identify the determinants of *C. difficile* mortality.

Although the decrease in *C. difficile* deaths in Michigan are consistent with national trends, this decrease has only been observed in recent years. This HAI remains an urgent threat and further progress is possible to prevent disease, health care costs, and death. To this end, it is essential to improve antibiotic prescribing and use, as well as practice adequate infection prevention and control measures.

Limitations

1. Rates are crude rates (total number of deaths, divided by the total population of interest, and multiplied by 100,000) and do not adjust for age.
2. The limited data did not allow for analysis of other factors known to be related to *C. difficile* morbidity and mortality.
3. There were missing/unknown values for some demographic variables.

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